

**SUSTAINABLE DEVELOPMENT :
A CASE STUDY OF
CHILIKA LAKE DEVELOPMENT PROGRAMME**

*Dissertation submitted to the Jawaharlal Nehru University
in partial fulfilment of the requirements
for the award of the degree of
MASTER OF PHILOSOPHY*

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CERTIFICATE

Certified that this dissertation entitled "**Sustainable Development : A Case Study of Chilika Lake Development Programme**", submitted by **Hara Prasad Nayak** in partial fulfilment of the requirements for the award of the degree of **Master of Philosophy** of Jawaharlal Nehru University is his own work and has not been submitted to any other University for the award of any Degree.

We recommend that it should be placed before the examiners for evaluation.

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PREFACE

The new strategy of development, 'sustainable development' as an indispensable organ of development policy and strategy has progressed quite a way since early 1970s under the recognisable pressures put on natural resources by the global evergrowing population (often as a consequence of wasteful and reckless treatment and exploitation of limited resources by the developed countries against the pressing dire necessities and needs of the masses in the developing nations) with their inevitable implications. Sustainable development along with systematic policy and practice of management of world's environment is under increasing pressure of the demands of population, agriculture, industrialisation, urbanisation and public awareness and also to conserve all systems through pursuits of friendly and sympathetic approach.

Hence, its imperative to evaluate the latest changes in the policy in Chilika region by allowing the private capitalist penetration into the artisanal fishing sector from the perspective of sustainable development. Since, the modernisation drive, leads to use of latest technology, it is apprehended that it may lead to the problems of overfishing and depletion of natural resources which in turn means loss of productivity and incomes for the majority of the traditional fishing folks with their loss of access to their traditional source of income. Besides, the environmental issue against the project assumes great

importance, as the government according to the Ramsar Convention has taken a decision for its conservation and management. Based upon this background, the first chapter of the dissertation analyses the causes of change in the concept of development from mere growth to growth with environmental sustainability. The concept of 'sustainable development' has been dissected and analysed and the strategies for making development sustainable have been discussed. Besides, the policy implications of the notion of sustainable development have been analysed to evaluate the recent changes in policy per se.

The second chapter 'India's Development Policy and Environment' discusses the causes of growing ecological consideration in developmental activities by the policy formulators in India. And also explores how far the Indian government has proceeded in saving 'Our Common Future' for the posterity while pursuing the developmental activities.

The third chapter 'Chilika Lake Development Programme' deals with the review of literature regarding Chilika lake and the ongoing and proposed developmental activities. The policies of the Government, the reports submitted by the Government, environmentalists, the Tata Project reports, the pamphlets circulated by the leaders of the 'Save Chilika Movement' are reviewed in this chapter.

In the 4th chapter, a chronological development of the movement to save Chilika Lake, the objectives and the effect of the movement are analysed before proceeding to the area study done by the researcher himself, during the course of writing the dissertation.

CHAPTER - 1

SUSTAINABLE DEVELOPMENT : THE CONCEPT AND ITS IMPLICATIONS

The problem of development is the major problem confronting the world. And development is the top priority of national government, particularly, in every third world country. But the notion of development is always in a flux. Evolution of the notion of 'development' is achieving new heights emphasising on broad spectrum of ideas varying from economic development, order, growth and distributive justice and resource allocation. And the latest addition in this spectrum of emphasis of the notion of development is the consideration of environmental protection, consumption and conservation. A development is no more considered to be development unless it takes care of the conservation of the natural resources for the future generation.

But before discussing how the latest notion of development, 'Sustainable Development', came into existence, it will be better to analyse first the concept of development per se. Development is a value-laden concept, with historical, philosophical and ideological dimensions.¹ Development ought to mean the development not

¹UNESCO, Goals of Development, p.9.

of things but of men and the satisfaction of their basic needs - food, shelter, clothing, health and education. A process of growth or development that does not lead to the fulfilment of these basic needs can not be regarded as development. Development is a "widely participatory process of directed social change in a society intended to bring about both social and material advancement (including greater equality, freedom and other valued qualities) for the majority of the people through their gaining greater control over their environment".² Development in any particular nation consists of a synergy of such development goals as promoting literacy, improving nutrition and health, limiting family size, or increasing productive capacity. Hence, development will be used in a wide sense and the concept shall not be confined to mere growth oriented production. Great importance will be attached to such factors as relative price stability during the growth process, development of production structure, income distribution, improvement in the living standards, modernisation of the production structure, reduction of regional disparities, promotion of internal control through people's participation etc. But of late, the environment or ecology friendly development strategy has gained importance.

²Singhal, A., Evolution of Development & Development Administration Theory, Indian Jr. of Public Administration, Oct-Dec. 1987, p.841.

During the 1950s and 1960s, a general optimism about development was widespread, however, the optimism gradually dwindled and a questioning stance about development characterised the 1970s. In 1970s egalitarianism did not continue to be in centre of economic agenda. In this period, instead of egalitarianism (- production should be so devised that there ought to be egalitarian society), efficiency and resource allocation i.e. how to use resources available in society in most efficient optimal fashion, became the main objective. Secondly, concept of development is not limited to growth alone. Growth can be achieved even in an authoritarian regime. In terms of capital or resources or production it was possible to extract surplus through methods which were not democratic. If this is the value given to growth then it is not development. So, identifying development with growth was not valid. However, in the beginning there was obsession with concept of political order. La Palombara, Huntington and many others have stressed the importance of bureaucracy and military as agencies of growth. Hence, concern was with stability and political order, even at the cost of democracy. The instrument of order were even otherwise more powerful than instruments of change.

However, in 1970s the ethos of 'growth with justice', became the dominant one, as noted by Lucian W. Pye. So now

development seemed to be associated with equality and distributive justice. Thus on the one hand growth remained the major issue, which is supported by both the protagonists of liberal and Marxist school, and on the other the quest of development led to the changing notions of development. And, no longer, development was looked as a single goal activity but a multiple goal activity. As a result of this now with stability new concepts of equity and geographical integrity came up. Development became far more broad based a concept, where other criteria than mere higher growth came to be evaluated. A country can not have an uneven kind of development. Resource efficiency (allocation and utilization) were seen not at the cost of stability integrity and equity. To these upcoming developmental ideas a new dimension was added when the issues of environmental protection and conservation of the nature came up. One can not have development which would lead to long term destruction of resources as the natural resources belong to next generations too. In this context Kenneth Boulding remarks that, "There is not enough of anything. There is not enough copper. There is not enough of an enormous number of elements which are essential to the development economy... Economic development is the process by which the evil day is brought closer when

everything will be gone".³ Hence, its high time to change the course of development.

Question arises as to why all on a sudden in mid-70s there is a greater concern for changing the notion of development by adding environmental consideration to it. Protection of the environment is now being seen as a prerequisite for sustaining economic growth. After acquiring a certain stage, the process of development, it was realised that it has reached a stage of stagnation. This has led to the persistence of poverty. More than 1 billion people still live in abject poverty.⁴ To reduce poverty, sustained and equitable economic growth is essential. But past economic growth has often been associated with severe degradation of the natural world. On the surface, there appears to be a tradeoff between meeting people's needs - the central goal of development * protecting the environment. Hence, emphasis should be on 'not to produce less, but to produce differently' because without adequate environmental protection, development will be undermined; without development environmental protection will fail. The persistence of poverty can be attributed to the rise in population. Population growth increases the demand for goods and services, and if practices remain

³Boulding, K., 'The Economies of the Coming Spaceship Earth', in Henry Jarrett, ed., Environmental Quality in a Growing Economy, Baltimore, 1966, p.166.

⁴World Development Report, 1992. p. 25.

unchanged, implies increased environmental damage. Population growth also increases the need for employment and livelihoods, which exerts additional direct pressure on natural resources and additional stress on the earth's assimilative capacity.

Besides, the negative externalities of developmental activities leading to deterioration of the condition of environment which challenges the very existence of people for whom the process of development is undertaken. The negative externalities of development as summed up by the World Development Report, 1992 reveals that, in poor countries:

- Diarrheal diseases that result from contaminated water kill about 2 million children and cause about 900 million episodes of illness each year;
- Indoor air pollution from burning biomass endangers the health of 400 million to 700million people;
- Dust and soot in city air cause between 300,000 and 700,000 premature deaths a year;
- Soil erosion can cause annual economic losses ranging from 0.5 to 1.5 percent of GNP;
- A quarter of all irrigated land suffers from salinization.
- Tropical forests - the primary source of livelihood for about 140 million people - are being lost at a rate of 0.9 percent annually.

- Concern over ozone depletion continues to grow. The consequences of loss of biodiversity and of greenhouse warming are less certain but are likely to extend far into the future and to be effectively irreversible.

In terms of incomes and output, the world will be a much richer place in the next century. But will the environment be much poorer? Will future generations be worse off as a result of environmental degradation that results from economic decisions made today? Will increase in the scale of economic activity be sustainable in the face of increasing pressure on natural resources? Thus, it raises fundamental questions about the kind of world we will bequeath to our children and about the nature and goals of development. Hence, addressing environmental problems and making development sustainable requires that the value of the environment be factored into decision making.

And in the process new strategy of development evolved to be talked about is 'sustainable development'. This new intrusion in terms of understanding development is because of mindless exploitation of natural resources which led to extensive poverty, social violence, deterioration of the condition of environment and worsening the situation for future generation.

Sustainable Development - What is it:

"The bare instrumentalism led to great material productivity and a world that now supports partially anyway, more than 5 billion people. The far-flung markets led to environmental exploitation from the poles to the tropics, from the mountain tops to the ocean depths. The success of the industrial revolution like the more limited successes of hunting gathering and of agriculture, eventually led to further scarcities, not only of game, not only of land, not only of fuels and metals, but of the absorptive capacity of the environment. Therefore, it has created the necessity for another revolution."⁵ And this revolution is revolution for sustainability. "Such a move would be a modification of society comparable in scale to only two other changes: the Agricultural Revolution of the late Neolithic and the Industrial Revolution of the past two centuries. Those revolutions were gradual, spontaneous and largely unconscious. This one will have to be a fully conscious operation, guided by the best foresight that science can provide... If we actually do it, the undertaking will be absolutely unique in humanity's stay on the Earth."⁶

⁵Meadows, D. et al., 'Beyond the Limits: Global Collapse or A Sustainable Future', Earthscan Publications Ltd., London, 1992 p. 221.

⁶Ruckelshaus, W.D. Towards A Sustainable World'. 'Scientific American, Sept. 1989 p. 167.

Now the question arises what is sustainable development (SD). The manner in which the phrase 'sustainable development' is used and interpreted varies so much that while O'Riordan called SD a 'contradiction in terms',⁷ Redclift suggests that it may be just "another development truism".⁸ The term SD has been confused with 'sustainable growth' and 'sustainable use', as if their meanings were same. However, sustainable growth is a contradiction in terms; nothing physical can grow indefinitely, sustainable use is applicable only to renewable resources: it means using them at rates within their capacity for renewal, whereas, SD is used as a strategy to mean improving the quality of human life while living within the carrying capacity of supporting ecosystems.

Taken literally, sustainable development would simply mean 'development that can be continued - either indefinitely or for the implicit time period of concern'. The semantics of sustainable development reveals that:

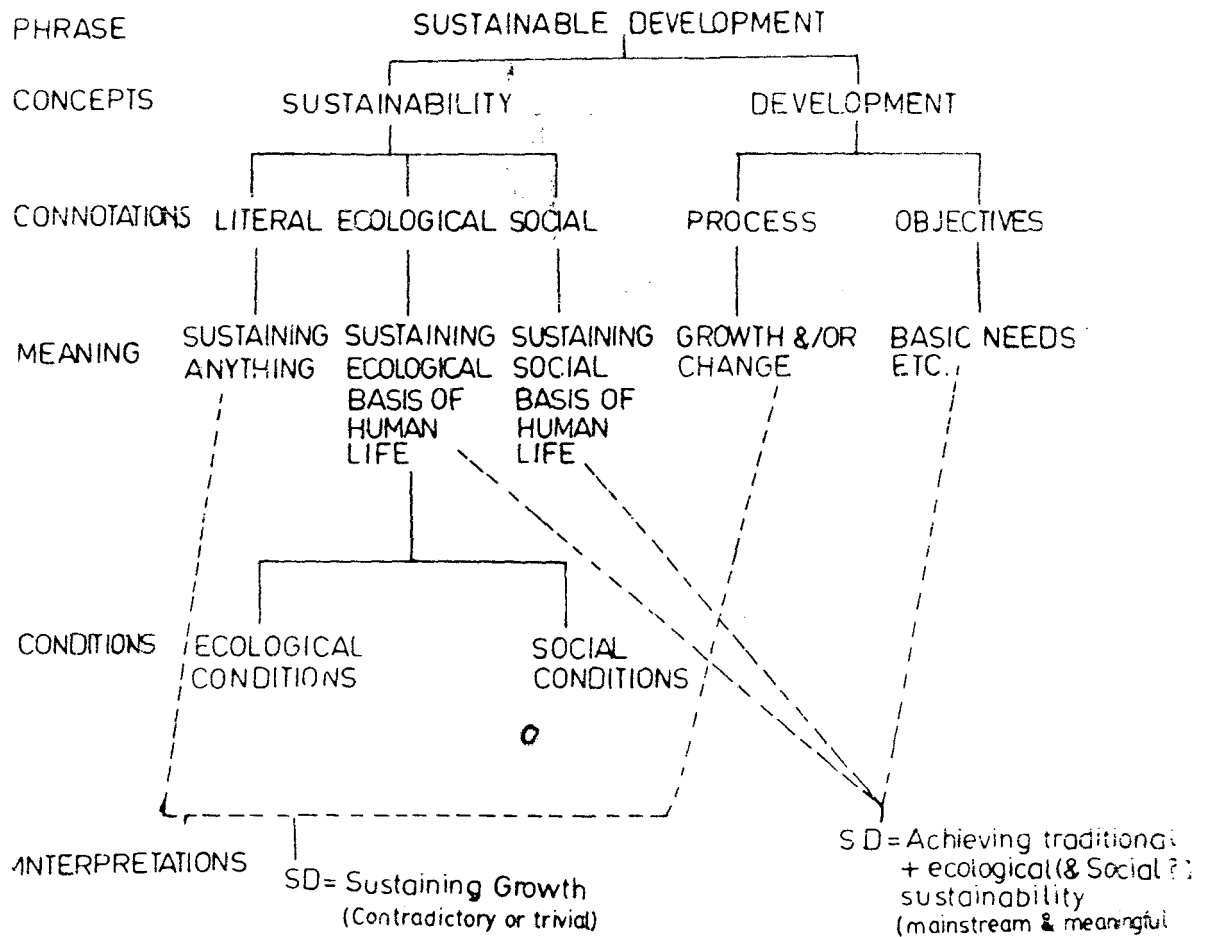
Sustainable Development = Sustainability + Development

Fig. 1. The Semantics of Sustainable Development.

The concept of sustainability originated in the

⁷O'Riordan, T., 'Future Directions in Environmental Policy', Jr. of Environment & Planning Vol. 17, 1985, pp. 1431-1446.

⁸Redclift M. "Sustainable Development: Exploring the Contradictions", Routledge, London and New York, 1987, p.1.



context of renewable resources such as forests or fisheries and has subsequently been adopted as a broad slogan by the environmental movement. Most proponents of sustainability therefore take it to mean the existence of the ecological conditions necessary to support human life at a specified level of well being through future generations. However, in addition to or in conjunction with these ecological conditions, there are social conditions that influence the ecological sustainability or unsustainability of the people - nature interaction. For example, one could say that soil erosion undermining the agricultural basis for human society is a case of ecological (un) sustainability. It could be caused by farming on marginal lands without adequate soil conservation measures - the ecological course. But the phenomenon of marginalization of peasants may have social roots, which would then be the social causes of ecological unsustainability. Whereas, development is a process of directed change and thus embodies the objectives of this process, and the means of achieving these objectives. Hence, sustainable development can be understood as a form of societal change that, in addition to traditional developmental objectives, has the objective or constraint of ecological sustainability.

The concept of sustainable development is against the

concept of growth-dominated, market oriented development.⁹ It is not only development which will conserve our resources and not destroy and damage them, as our present development models are doing. Sustainable development is equally important because it is development for all and not for a few in society. The uncontrolled economic growth causes the quality of the environment to deteriorate, economic development to decline and the standard of living to drop. (see Fig. 2).

Fig. 2 Schematic Representation of the Predicament of Development, Environment and Population growth

Hence, sustainable development, if it is to be an alternative to unsustainable development, should imply a break with the linear model of growth and accumulation that ultimately serves to undermine the planet's life support system.¹⁰ This doesn't mean that development is not without some cost. There will be depletion of resources and some damage to the environment. However, there is enough scope for on the use of resources and reducing the potential damage to the environment due to developmental projects.

With this background, the term sustainable development was used at the time of Cocoyoc declaration on environment and development, in the early 1970s. The term sustainable

⁹Adiseshiah, Malcolm S. (ed.), *Sustainable Development: Contents, Scope & Prices*, Lancer International, 1990, p.2.

¹⁰Redcliff, M., *ibid.*, p. 7.

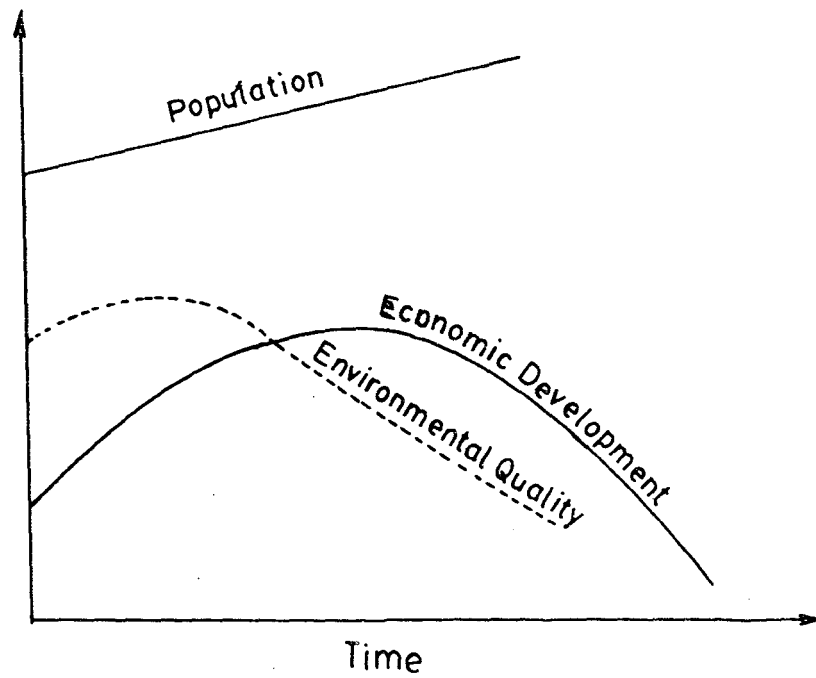


Fig. 2, Schematic Representation of the Predicament of Development environment and population growth.

development suggested that the lessons of ecology could be applied to economic processes. However, the concept of sustainability received its greatest boost from the publication of the World Conservation Strategy (IUCN 1980) with the aim of achieving sustainable development through the conservation of living resources. In addition, the strategy explicitly linked the maintenance of ecological processes and life-support systems, the first of its three programme priorities to the sustainable utilization of resources and the maintenance of genetic diversity. Thus, WCS was able to make a profound contribution toward reconciling the interest of the development community with those of the environmental movement.¹¹ However, the WCS was essentially supply-sided, [in that] it assumed the level and structure of demand to be an independent and autonomous variable, and ignored the fact that, if a sustainable style of development is to be pursued, then both the level and particularly the structure of demand must be fundamentally changed, argues Sunkel.

At this juncture, the United Nations Environment Programme (UNEP) was at the forefront of the effort to articulate and popularize the concept. UNEP's concept of SD was said to encompass:

¹¹Khosla, A., 'Alternative Strategies in Achieving Sustainable Development' in P. Jacobs & D.A. Munro (ed.) Conservation with Equity: Strategies for Sustainable Development (Cambridge: IUCN, 1987) pp. 191-208.

- (i) help for the very poor, because they are left with no options but to destroy their environment;
- (ii) the idea of self-reliant development within natural resource constraints;
- (iii) the idea of cost-effective development using non-traditional economic criteria;
- (iv) the great issues of health control, appropriate technology, food self-reliance, clean water and shelter for all; and
- (v) the notion that people-centred initiatives are needed. While providing food, water, good health and shelter have traditionally been the fundamental objectives of most development models, it is not clear whether self-reliance, cost effectiveness, appropriateness of technology and people-centredness are additional objectives for the operational requirements for achieving the traditional ones.

A similar proliferation of objectives was apparent at the IUCN-UNEP-World Wildlife Fund sponsored conference on Conservation and Development held in Ottawa in 1986. Summarising the debate, the rapporteurs Jacobs, Gardener, and Munro said that, "Sustainable Development' ... seeks to respond to five broad requirements:

- (1) integration of conservation and development;
- (2) satisfaction of basic human needs;

- (3) achievement of equity and social justice;
- (4) provision of social self-determination and cultural diversity ; and
- (5) maintenance of ecological integrity."

In contrast to the aforementioned, the currently popular definition of SD - the one adopted by the World Commission on Environment and Development (WCED) - is quite brief: "Sustainable Development is development that meets the needs of the present without compromising the ability of future generations, to meet their own needs".¹² While the WCED's statement of the fundamental objectives of SD is brief, the Commission is much more elaborate about (what are essentially) the operational objectives of SD. It states that, the critical objectives which follow from the concept of SD are:

- (1) reviving growth;
 - (2) changing the quality of growth;
 - (3) meeting essential needs for jobs, food, energy, water and sanitation;
 - (4) ensuring a sustainable level of population;
 - (5) Conserving and enhancing the resource base;
 - (6) reorienting technology and managing risk;
 - (7) merging environment and economics in decision making;
- and

¹²World Commission on Environment & Development, 'Our Common Future' (New York: Oxford University Press, 1987) p. 43.

(8) reorienting international economic relations.¹³

Most organisations and agencies actively promoting the concept of SD subscribe to some or all of these objectives with, however, the notable addition of a ninth operational goal, viz., (9) making development more participatory.

Thus, sustainable development is a concept which draws on two frequently opposed intellectual traditions: one concerned with the limits which nature presents to human beings, the other with the potential for human material development which is locked up in nature. Sustainable development means more than seeking a compromise between the natural environment and the pursuit of economic growth. It means a definition of development which recognizes that the limits of sustainability have structural as well as natural origins.¹⁴ "And the movement towards sustainability", argues Stephen Viederman, "will direct attention to systems rather than single issues, and to system change rather than the application of Band-Aids to present ills".¹⁵ It will be holistic rather than reductionist, looking ahead to the longer term rather than simply at events. Qualitative change - development - rather than quantitative change - growth will be its goal, with

¹³WCED, *ibid.* p. 49.

¹⁴Redcliff, M. *ibid.* p. 199.

¹⁵Viederman, S. 'SD: What is it & How Do We Get There', *Current History*, Apr. '93 p. 183.

social justice and equity central to its world view. Its world view will also call for respect for nature rather than a preoccupation with the management of nature.

However, one thing it is clear that, sustainable development is not a static concept, it is a dynamic process and is applied by different countries in tune with their own cultural, political and economic perspectives. But there is agreement on the broad outline of what constitutes sustainable development or how sustainable development differs from development in general:

- (i) It can not be achieved in the short run;
- (ii) It is based on equity and justice;
- (iii) Its approach is balanced and integrative;
- (iv) It has common goal but different routes;
- (v) It accepts nature not only for as a resource for development but also as the earthly womb for survival and development of humankind; and
- (vi) It is participatory in nature.

Sustainable development has to be a long-term process, and one may say a continuing process. The economic, political, technological and social structure and superstructure built during the last few centuries the world over can not be dismantled in a day. No structure is, however, permanent. Elemental and partial changes do take place as a part of renewal process. This renewal process can be accelerated within the tolerable birth pangs and

death agonies that mark any such change. The renewal process must aim to achieve the characteristics of sustainable development listed above.

Equity and justice are the sin-qua-non of sustainable development. It is four dimensional: (1) Equity among nations; (2) Equity within a country - between regions, social classes, genders, sectors of activities; (3) Equity between generations; and (4) Equity between economics and ecology and science and spirituality. Equity is not equality; nor does it have any negative connotations. Equity promotes variety but not disparity. It is positive in the sense that it does call for a fair distribution of harmful things. Moreover, it is directly linked with ability and capacity to bear the burden. This means that rich countries, rich regions, rich groups and the favoured sex will have to take greater responsibility for sustainability. Equity between generations invariably raises contentious issues like: Why should the present generation bother about the future? Presuming that the dependence of the future generations on nature will not be less than our own, humanity demands that we should not defer costs of present development to our children. Lastly, equity between our economic and ecological interests has to be established. Economics and science have great potentials for human welfare. In fact, they have taken humanity to a point of achievement beyond imagination. But their side-

effects on man and environment are proving to be unbearable. What is needed now is integration of economics and ecology and science and spirituality to cure the development disease inflicting humanity and also to carry man safely to new heights of glory.

Sustainable development demands a change in our attitude towards nature. Nature is not just a material resource for human consumption. Man is also a part of nature. There is an urgent need, therefore, to move away from the cartesian world-view and post ourselves in the ecological world view. The idea is not to go back to the past, but to create a new future out of the present, the present as it is. The past can help in the shaping of the new future.

And finally, sustainable development is not the business of the government and private companies alone. It is the business of the people in general. It is a process which has to be initiated at each level of human endeavour and life. It involves individuals, families, communities, corporate bodies, nations and global society. It has to be a movement, because it involves paradigmatic change which is difficult to bring about unless great many people get involved. Democratisation of decision making and decentralisation of power and authority is, therefore, a must. Thus, it can be said that sustainable development is a comprehensive term. It involves far more than environment

friendly technology. It involves paradigm change; it involves change in style of development, it involves change in our attitude towards nature; and it involves political, social and ethical changes.

Strategies for Sustainable Development

Now the question arises regarding the desirability and feasibility of sustainable development. Mere transformation of 'development' into 'sustainable development' does not necessarily integrate concerns regarding equity, environmental protection, people's participation and maintaining biological and cultural diversity. While the resource-exhausting properties of the current model of development is not appropriate, alternatives are searched for in the model of sustainable development. Economic growth that improves human welfare is urgently needed, but at the same time protecting the environment will be an important part of improving the wellbeing of people today, as well as the well-being of their children and grand children. The World Development Report, 1992 suggests a threefold strategy for meeting the challenge of sustainable development.

- (a) Build on the positive links: Policies for growth promote efficient use of resources, technology transfer, and better working markets - all of which can help in finding solutions to environmental

challenges. Rising incomes can pay for investments in environmental improvement. Policies that are effective in reducing poverty will help reduce population growth and will provide the resources and knowledge to enable the poor to take a longer-term view.

- (b) Break the negative links: Rising incomes and technological advances make sustainable development possible, but they do not guarantee it. Usually, additional incentives that capture the true value of the environment will be required to induce less-damaging behaviour. Effective environmental policies and institutions are essential.
- (c) Clarify and manage the uncertain links: Many relationships between human activity and the environment remain poorly understood and there will always be surprises. The response should be investment in information and research and the adoption of precautionary measures, such as minimum standards, where uncertainties are great and there is a potential for irreversible damage or high costs in the long run.¹⁶

Sustainable development must meet the needs of the present generation without compromising the ability of future generations to meet their own aspirations and needs. Sustainable development is a process in which the

¹⁶World Development Report, 1992, p. 43.

exploitation of resources, the direction of investments, and institutional changes are all made consistent with future as well as present needs. Thus, sustainable development involves symbiotic relationship between consumer human race and producer natural system, and compatibility between ecology and economics. Hence, argues P. Khanna that some constitutional preconditions must be satisfied while working for the goal of sustainable development:

- (a) equity and social justice;
- (b) economic efficiency;
- (c) ecological harmony;
- (d) endogenous choices.¹⁷



Sustainable development involves devising a social and economic systems which ensures that the goals of development are sustained. The means of achieving sustainable development in this broad sense might be summarized as follows:

- (a) The value of the environment: sustainable development involves a substantially increased emphasis on the value of natural, built and cultural environments. This higher profile arises either because environmental quality is seen as an increasingly important factor contributing to the achievement of

¹⁷Khanna, P. 'Sustainable Development' in Gupta N.L. & Gurjar, R.K. (ed.), Sustainable Development (Vol. I), Rawat Publications, Jaipur & N. Delhi, 1993, p. 23.

traditional development objectives such as rising real incomes, or simply because environmental quality is part of the wider development objective of an improved quality of life.

- (b) Extending the time horizon: Sustainable development involves a concern both with the short - to medium-term horizons and with the longer-run future to be inherited by our grand children and perhaps beyond.
- (c) Equity: Sustainable development places emphasis on providing for the needs of the least advantaged in society (intragenerational equity), and on a fair treatment of future generations (intergenerational equity).

These three concepts of environment, futurity and equity are integrated in sustainable development through a general underlying theme. The theme is that "future generations should be compensated for reductions in the endowment of resources brought about by the actions of present generations".¹⁸ If one generation leaves the next generation with less wealth then it has made the future worse off. But sustainable development is about making people better off. Hence, compensation should be given for future development which can take place in two ways.

- (a) Compensation for the future is best achieved by

¹⁸Pearce, D., 'Bludeprint for a Green Economy', 1993, p.3.

ensuring that current generations leave the succeeding generations with at least as much capital wealth as the current generation inherited;

- (b) Compensation for the future should be focussed not only on man-made capital wealth, but should pay special attention to environmental wealth. That is, future generations must not inherit less environmental capital than the current generation inherited.

The concept of sustainable development is closely linked to the carrying capacity of ecosystem as depicted in Fig. 3

Accordingly, the underlying correlation between population, poverty and pollution must be analysed against the backdrop of ecosystem's capacity to provide supportive capacity for development and assimilative capacity for maintenance of acceptable quality of environment. Hence, the agenda for sustainable development must include carrying capacity based developmental planning process. Sustainable development calls for trade-offs between the desired production - consumption levels through the exploitation of supportive capacity and environmental quality within the assimilative capacity of regional ecosystems. The utilization of carrying capacity thus requires a series of adjustments to reconcile competing aspirations in development; process. This shift in developmental planning process also brings out the fact

CONCEPT OF REGIONAL CARRYING CAPACITY

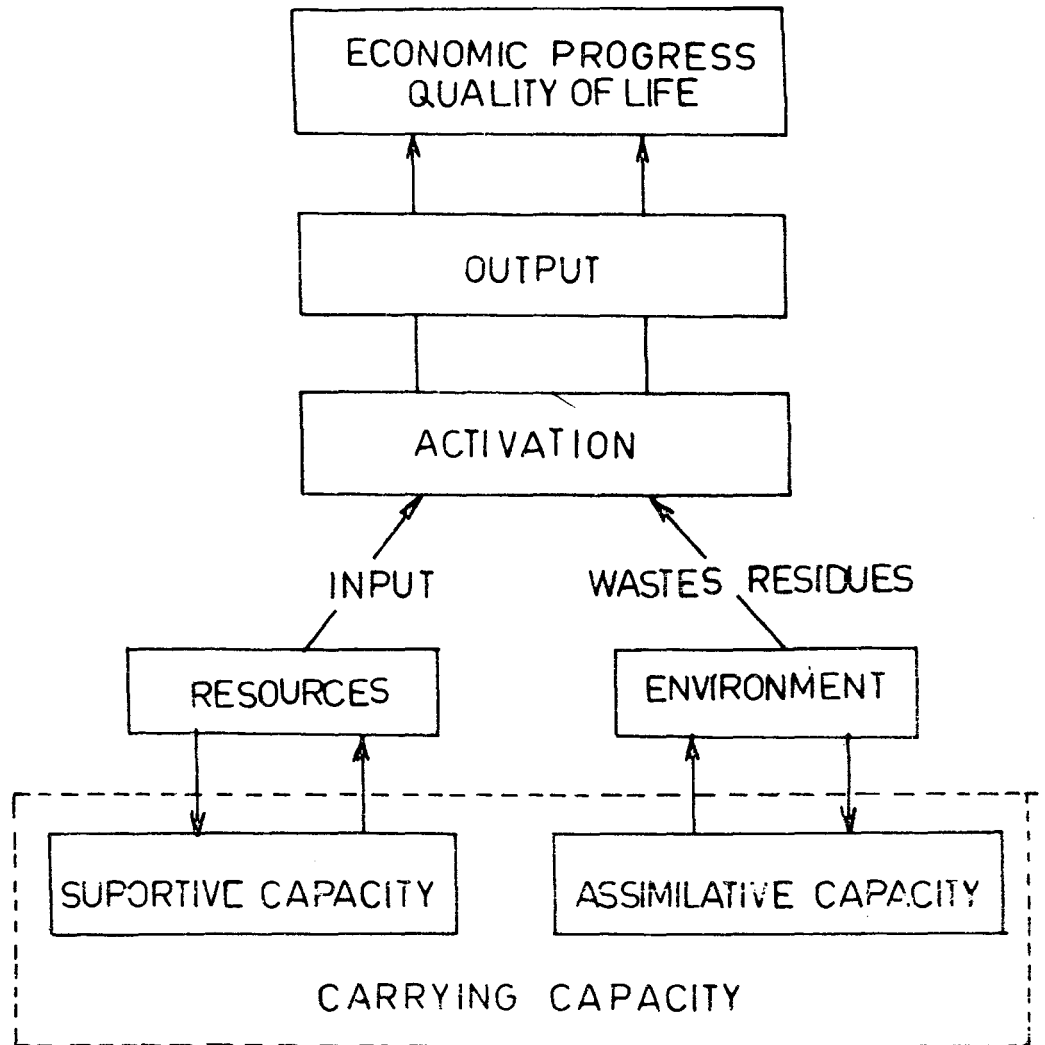


FIG. 3

that analytical models could be used to answer technical questions whereas value judgements must be made in societal and political domains for devising pragmatic developmental and environmental strategies.¹⁹

Beside these strategies, sustenance of development also depends upon the degree of people's participation in the development process. Individuals are the primary justification for development. They are the means to development as the source of labour. But then they are also the end as they should be the ultimum beneficiary of the development process. World Conservation Union defines sustainable development as "improving the quality of human life while living within the carrying capacity of supporting eco-systems".²⁰ Thus, development is for people and as such an essential element in the development process is people's participation. Some authors, after studying the development programmes of developing countries, like Kenya, stress the need for local participation. The consensus is that if development is to be sustainable, it must be participatory and community based. Development can not be imposed from outside or above, the desire for development must come from within. The Fifth International Action for Development/FFHC conference stressed that development can

¹⁹Khanna, P., *ibid.* p. 24.

²⁰World Conservation Union, *Caring for the Earth*, Gland (Switzerland).

be a reality with the involvement of people only.²¹

Development, being a multi-dimensional phenomenon, requires effective involvement of the community in achieving its goals. In a developing country the resources for development at the command of the government are very limited and scarce. As such, in order to carry out local-sustainable development measures effectively, community needs to be mobilised - physically, psychologically, financially and materially - to supplement the resources provided by the government and other extra-community sources. In the overall strategy of sustainable development policies and implementational work plans, community input in the form of a systematic arrangement for participation of the people of the community in policy making and for a regular feedback in regard to sustainable development programmes may help in decision-making process at different levels. The community could raise substantial financial and human resources from the community for sustainable development which otherwise might remain unused such as the enthusiasm and energy of the youth of the local community and women of the area. Instead of relying upon voluntary and individual contributions, the community with institutional structures - such as local self-government, cooperative societies, etc. - having a control over the

²¹FAO, Fifth International Action for Development/FFHC Conference, Rome, 1971.

local community could mobilise resources for community social welfare purposes more easily. In spite of its sincere and best efforts, the government can not promote sustainable development entirely from its own resources. It is, therefore, desirable and imperative that the intended beneficiaries themselves contribute to the extension of sustainable development just to minimise the cost of development projects.

People's participation is the process in which individuals and families assume responsibility for their own development. It is because they better know their own situations and are motivated to solve their common problems. Instead of being passive beneficiaries of development assistance, this strategy may enable the members of the community to become agents of their own development. Thus, it is the community's positive role, which can help in preserving the environment, saving our common future, and making the development sustainable.

Policy Implications for Sustainable Development:

The 1992 UNDP Report states: "Sustainable development is a process in which economic, fiscal, trade, energy, agriculture and industrial policies are all designed to bring about a development that is economically, socially and ecologically sustainable." Hence, it is necessary to analyse the nature of policies that would contribute to

sustainable development.

- (a) Need for indepth and feasibility studies: The development programmes have not had the desired results. One of the basic policies would be initiation of depth studies to understand the variables that have affected programme implementation - negatively or positively. The study would suggest necessary action to correct the course of development programme. A second aspect of policy on studies would be to undertake feasibility studies before any activities are started. An expediency approach is not conducive to sustainable development. A policy, therefore, should be initiated to undertake impact studies, feasibility studies and pilot studies.
- (b) Need for policies to prevent negative impact: Studies have indicated that some programmes have resulted in the deprivation of people. Policies have to be formulated to prevent the negative aspects. Policies need also to be enacted to ensure that development programmes have a positive impact. For example, control of population growth is an accepted policy, but the policy needs to go beyond. It should also be concerned with improving the quality of life, which itself can reduce population growth.
- (c) Need to take long-term view: What is being suggested is the need for positive policies to promote growth

which is continuous and positive and hence sustainable. This requires a distant view - it could mean going beyond the Five-Year Plan approach. The policy should concentrate on building a long-term strategic vision of the future and sets the priorities of the nation and planning should be more perspective.

- (d) Need for holistic view: As sustainable development covers the whole gamut of human activities, specific policies should be formulated.
- (e) Need for feedback system: The feedback information system is weak in most of the development programmes. The major approach has been to collect statistics rather than an analysis of variables that affect the functioning of the programmes. There is need for an effective monitoring system which provides data on what is being achieved in given time. Monitoring by itself does not provide an analysis - for that a concurrent evaluation should be carried out. It would, if done systematically, analyse the factors affecting the implementation of the programme. A policy which caters to sustainable development, should provide for monitoring and evaluation system.
- (f) Need for attitudinal change: The process of development involves a change in the attitude and behavioural patterns of the people. Policy should make provisions for imparting knowledge through an

information system. A change in behaviour will persist if it is based on some rationale in the acceptance of a programme. Another aspect of changing behaviours is the need for empowerment of the people. When people feel that they have a part to play in the process of development, their commitment is likely to be greater. Sustained efforts are necessary to make people realise that they can and need to help themselves. The policy should define the role of relations with the NGOs. Participation should include material contribution. The stake in the sustenance of a programme is greater in which people have put in some of their own resources.

- g. Need for institution building and people's participation: Institution building is very necessary for sustainable development. Developmental activities undertaken with people's active participation has a greater chance of success. The focus of attention should be on developing multiple institutional options for improving the delivery system using the vast potential of the voluntary sector. Institution building would mean encouragement and support for the changed patterns of human behaviour. It would also refer to people's participation and their ability to respond to change and changing environment. A sensitive and responsive bureaucracy would allow more

scope for sustainable development.

However, if sustainable development is to be really 'sustained' as a development paradigm two apparently divergent efforts are called for: making sustainable development more precise in its conceptual underpinnings, while allowing more flexibility and diversity of approaches in developing strategies that might lead to a society living in harmony with the environment and with itself.

Chapter 2

INDIA'S DEVELOPMENT POLICY AND ENVIRONMENT

India is among the richest countries in biological diversity supported by a unique range of topography and climate stretching from the world's highest ranges in the Himalayas, with permanent snow and temperatures much below freezing point, through the grasslands and plains of central India, the plateau of the Deccan, the dry and hot Thar Desert of Rajasthan, the wettest areas in the world around Cherrapunjee, a long coast line and islands in the Bay of Bengal and the Arabian Sea. It supports 16 different types of forest systems ranging from the tropical evergreen forests of the Andaman and Nicobar Islands the North-East and the Western Ghats, to the temperate coniferous and pine forests of the Himalayas, and the alpine pastures. The country has ample sunshine and rich soils supplemented over centuries by great rivers bringing down and depositing rich silt from the Himalayas and other mountain ranges. The Indo-Gangetic plain is considered among the richest agricultural areas in the world.

But India is also faced with formidable environmental problems and threats. It has a huge population (expected to

cross the one billion mark by the turn of the century), much of which lives in poverty. According to recent estimates, over 250 million children, women and men suffer from under-nutrition. It has a domesticated animal population of nearly 500 million. Considering only 3.5 percent of the land area is under grasslands, this population is supported by the forests and by agricultural residues which are thereby diverted from agricultural land. Out of total cultivable land, 175 m. ha. are degraded needing special treatment to restore productivity. Of the 75 m. ha. designated as forest land, only about 35 m. ha. are closed forests. Despite all efforts, India has continued to lose forest cover during the last decade. Over 1500 species of plants and animals are on the endangered list. Levels of air and water pollution are much beyond acceptable limits especially in the cities and industrial belts. A very large proportion of the surface water sources in the country is not fit to drink from.

This depletion of natural resources and pollution of the environment is much more a cause of poverty than a result of it. Therefore, efforts to eradicate poverty, through development projects, cannot succeed if in the process environment is further degraded. Thus, it is being felt that for a self-sustaining development within a nation and throughout the world, keeping in mind a futuristic perspective, the ostensibly conflicting claims of ecology,

environment, economics, energy, equity, ethics and efficiency have to be reconciled and harmonised for common good and common future.

In this fast-worsening scenario, it is important to analyse the growing ecological consideration in developmental activities by the policy formulators in India. In order to make development sustainable and to conserve the resources for the posterity, the value of the environment should be factored into decision-making. This Chapter will explore how far the Indian Government has proceeded in saving 'Our Common Future'¹ for the posterity while pursuing the developmental activities.

Planned Development: The Indian Experience

Since independence, the government in India has undertaken many new functions, in a deliberate bid to use the government machinery to promote the development of the country. The main decision about the development policy is always made by the policy-makers in the Government in power. The policy choices are basically influenced by the interplay of economic and political forces. The composition of coalitions of ruling classes in a multi-structural society and the actual stage of development of productive forces in various sectors of the economy are main

¹Our Common Future, Oxford University Press, 1987.

determinants of policies followed by the Government.² The wisdom of policy formulators lies in identifying the most progressive, dynamic and leading mode of production in the complex interplay of multi-structural formations and selecting appropriate strategies for the development of this mode by reaching a consensus between various interests. A long-term development strategy therefore implies that the continuous changes in mode and relations of production are simultaneously translated into appropriate alterations in short-term policies and programmes.

The initial thoughts about development strategies in India constitute a part and parcel of the freedom struggle in the country.³ The post-independence development strategy was pursued through a planned process. When the planning process was initiated in India, there was a legacy of pre-independence debate on India's development problems.

The debate was centred around the concern for poverty alleviation, nationalisation, agricultural growth etc. The primary objective was to improve the condition of the Indian people battered by the centuries old colonial government. However, during these hectic days of debating for an appropriate development strategy and its objectives,

²Bhalla, G.S., 'Alternative Development Strategies in Indian Development' in *Alternative Strategies & The Indian Experience*, ed. by B.K. Joshi. p. 91.

³Bhalla, G.S., *ibid*, p.92.

the concern for environmental protection and a particular environment friendly development strategy was never thought about. Although it was then absent in the agenda of development strategy throughout the world itself. And in India the debate centred around the Gandhian approach, at one end, and the modernizing approach of Nehru at the other. The Gandhian approach had never been seriously discussed by either mainstream economists or by its left-wing critics. Both the approaches agreed on the central problematique of development,⁴ i.e. rapid growth oriented policies, but they differed sharply around the role and function of the market in the development process. Interestingly, the Gandhian approach has received a certain measure of support in recent writings of ecologists and ecologically minded economists which in the early fifties appeared to lack substantive theoretical foundation. However, the modernizing school under Nehru won the day as their scientism seemed more compatible with the ideological priorities involved in building up a post-colonial nation-state, although some vestigial traces of the alternative approach remain in the attitude to certain very small-scale industries, such as hand-spinning, generally known in India as the tiny sector.

The first three five year plans, which bore the

⁴Chakravarty, S., 'Development Planning: The Indian Experience', Delhi Oxford University Press, 1987, p.7.

personal imprint of Nehru - and especially the Second Plan, gave concrete shape to the vision of transformation - social and economic. The First Plan has been praised as the most successful because of its very modest (12%) targeted increase in national income over the plan period was surpassed in execution.⁵ The plan had emphasized public irrigation as a leading input into agriculture, but otherwise its diagnosis and solution for the development problem ran along very conventional lines.

The real break with the past came with the 2nd Five-Year Plan. This saw the articulation of what may be called the 'Nehru-Mahalanobis' strategy of development. It was primarily a strategy of industrialisation which hoped to succeed by forging strong industrial linkages, both backward and forward. Moreover, a capital goods sector was sought to be created in 2nd Five Year Plan where exchange of goods would not take place between producer and consumer but between producer and producer to produce more machinery which are to be used for the development of the nation. The development strategy adopted in the 2nd Plan was meant for promotion of rapid growth by increasing scope and importance of public sector and development of heavy industry to strengthen the foundations of economic independence. Production of the required supplies of consumer goods would be mainly through household and hand

⁵The Third Five Year Plan, p. 39.

industry which were to be protected against competition from the factory made article and the importance of agriculture was reduced. So, the adoption of mixed economy pattern with private sector and the state competing for scarce resources made finances a major problem. A modernised capital-intensive industrial sector was to be created side by side with private agriculture, with continued functioning of a private industrial sector confined to labour intensive and light consumer goods. Hence, Mahalanobis, in his famous four sector model wanted to define a dual development thesis - (i) high employment growth with (ii) building up of a capital goods base. And its the Industrial Policy Resolution, 1956 which laid the foundation for bringing out development and making the country self-reliant through industrialisation. The 1st and 2nd Five Year Plan ushered in the policy framework and objectives of an industrial India. The emphasis on rapid growth through intensive agriculture and industrialisation became the catchword. The Industrial Development and Regulation Act, 1948 and the Industrial Policy Resolution, 1956 enunciated for the industrial growth of the country through optimum utilization and exploitation of the available natural resources. The state, thus, was taking the lead in ensuring rapid growth through industrial development. However, the plethora of policies and strategies of the state through its Five Year Plans and the

private entrepreneurs were silent or ignorant of the environmental impact of industries and the future of the available natural resources. The non-renewable nature of natural resources were never considered while planning for the future. This myopic vision on the environmental consciousness becomes glaring when there is no mention of the protection of environment caused by the hazards of industrialisation, in the Industrial Policy Resolution, 1956 and various other development policies of the state.

Among the priorities listed in the 3rd Five Year Plan, it was recognised quite explicitly that agriculture had the first place. The policy for agricultural development, it was thought that, would supplement the growth of industries by providing cheap labour and cheap food. But there were two main exogenous shocks which did a great deal to upset the general optimism about Indian growth, which in turn led to substantial changes in agricultural strategy both in fact as well as in formulation. These were the sharp increase in defence spending after 1962, and the two successive monsoon failures in 1965 and 1967 which led to catastrophic declines in food production. To overcome the agricultural stagnation, a new strategy of agricultural development was formulated during the annual plan period, which was carried over into the Fourth Five year Plan.

The new strategy laid emphasis on technological modernisation. And Green Revolution was introduced as an

experiment in development and agricultural transformation. Green Revolution was designed as a techno-political strategy.⁶ for bringing out development, through the creation of abundance by breaking out of nature's limits and variabilities.

The Green Revolution was based on the assumption that technology is a superior substitute for nature, and hence a means of producing growth unconstrained by nature's limits and thus leads to the creation of technology which create new scarcities in nature through ecological destruction. The reduction in availability of fertile land and genetic diversity of crops as a result of the Green Revolution practices indicates that at the ecological level, the Green Revolution produced scarcity, not abundance.

Till then the assumption that continued was that through growth poverty can be eliminated. Based upon the trickle down effect it was assumed that the development of a country depends upon the level of growth which will trickle down to the poverty-stricken people. The concern for poverty came only after 4th Plan. Till that period primacy of growth was emphasised. "A high rate of economic growth sustained over a long period is essential condition for achieving a rising level of living for all citizens and

⁶Shiva, Vandana, 'The Violence of the Green Revolution: Third World Agriculture, Ecology & Politics, London, Zed Books, 1991, p. 11.

especially those in low income groups or lacking opportunities to work."⁷ In this phase the distributional objective remained secondary in importance and basically an adjunct to predominant growth orientation.⁸ But after 1962 the focus of discussion shifted from the worsening of relative economic inequalities to the magnitude of problem of absolute poverty and consequently from growth to redistribution with growth strategy, but the concern for environment friendly development remain insipid.

The broad objectives of planning could be defined as rapid economic development accompanied by a continuous progress towards equality and social justice and establishment of social and economic democracy.⁹ Hence, the 4th Plan adopted a 3-pronged strategy viz. Restoration of economy on the path of rapid growth; surplus over current consumption from higher income groups were to be mobilised for larger consumption in future; reduction of inequalities through greater diffusion of enterprise and ownership of means of production, increasing productivity of weaker sections and widening of opportunities for productive work and employment to the common man and particularly less privileged of the society.

⁷Tendulkar, S., 'Economic Reforms', The Economic Times-Oct.'91.

⁸Chakravarty, S., *ibid.*, p. 38.

⁹4th Five Year Plan.

During the Vth Plan the economy had reached a stage where a larger availability of resources was possible to launch a direct attack on unemployment and poverty and also ensures adequate growth and bring out development in the rural areas. This strategy was pursued in the 6th and 7th Plan. But there has been a considerable shift in the concepts relating to rural development. The General Development Approach adopted through the '50s that much depended upon the percolation theory was replaced in late '50s and through '60s by (Intensive) Area Development Approach which included the intensive agricultural district programme, but it led to the increase in consumption of fertiliser, which led to the erosion of the environment. This by early '70s, gave way to an Egalitarian Approach to Development. A number of new programmes were introduced for the underprivileged target groups - and depressed areas as part of the 4th and 5th Plans. The scheme of SFDA and MFAL agencies were initiated with the specific object of ameliorating the economic conditions of small/marginal farmers and agricultural labourers to bring them into the mainstream of economic development. But the assistance was misappropriated. This, in turn by mid-70s was substituted by an 'Integrated' or 'total' development approach. The centre of this programme is the development of village as a whole, where the interest of the entire village community including small farmers, marginal farmers and landless

agricultural labourers is kept in view. This approach also failed to generate popular participation, as it was a top-down programme having no initiative from the local level. By late seventies the integrated approach was readopted to an Egalitarian Development strategy and we presently have a combination of the two.¹⁰ But this strategy of development seemed to have less effect on the overall development of the nation. These top-down strategies became a failure as it failed to generate participation at the local level and did not cater to the mopping up of local resources. And the concept of participatory development which has a dimension of ecological sustainability of development projects, failed in the case of India.

However, the 8th Plan seems to be a watershed as it provides a new strategy for development which emphasises upon the participatory development of the nation which is eco-friendly. It seems that again there is a going back to the Gandhian strategy of development which pleads for a highly decentralised self-reproducing village communities having a better balance between man and nature. And in the 8th Plan the main thrust of the development revolves around the harnessing of the latent energies of the people through people's involvement in nation-building and creating environment to encourage initiatives at the local level in

¹⁰Ahuja, S.P., 'Environment, Development & Poverty', 1992, p. 68.

order to bring out a societal change and to make development sustainable. The plan also envisages the environmental assessment of all the development projects and the pursuit of economic development should not be socially and environmentally destructive.

Thus, the process of development in India has been nourished by the planning process. And it is through this planned strategy, India is pursuing its economic development and gradually the environmental concern is spreading its tentacles upon the policy formulator to be counted as a major factor in development policies.

Environmentalism and Development

If one were to list the important issues facing the world today environmental concerns would appear high in the ranking. The threat to the ozone layer, the green-house effect, desertification, loss of biological diversity and pollution are all problems which have convinced the government of the need for cooperative action to protect and improve the environment. At the same time, poverty, malnutrition, high population growth, large-scale unemployment, oppression and violence, and inequalities of income persists despite considerable development efforts. In the 1980s, in an attempt to solve both development and environment problems, the focus shifted to the concept of sustainable development which implies a long-term perspective and a concept of economic and social

development and growth which involves greater sensitivity to environmental concerns. Protection of the environment is now being seen as a prerequisite for sustaining economic growth.¹¹ Hence, environmentalism, as a theme in social sciences, seeks to search for the environmental factors in the development of culture and society. Environmentalism is construed variously as a social movement, a cluster of ideas based on ecology, a back-to-nature philosophy, or merely a greater interest in environmental affairs.

Though there had been some interest in the conservation of nature over the years, the environmental concern began to take shape in a more concrete and multidimensional form in the early 1970s. Environment became a public issue and more importantly, began to be seen as being closely linked to economic and social development. The UN Stockholm Conference of 1972 was a major event in the environment dialogue and gave a considerable boost to the environmental concern in development policies. It was the Club of Rome's report published in 1972 which recommended a "transition from growth to global equilibrium" and emphasised the need to "establish a condition of ecological and economic stability that is sustainable far into the future". A feature of the movement by this time was the apparent antagonism of

¹¹Directory of Non-Governmental Environment & Development Organisations in OECD Member Countries, Environment & Development in the Third World, p. 23.

developing countries towards environmental concerns. According to Nitin Desai, this antagonism was a result of the nature of the movement itself which had earlier focussed more on 'tigers and pretty trees' than on 'pollution related' issues.¹² Environment had thus far not been seen in the broader context of development, and in developing countries there was a general feeling that in the face of so many fundamental problems like poverty, unemployment, illiteracy and over-population, they could not afford to divert scarce resources for pollution control or other environmental protection measures. The resistance from developing countries towards including environmental issues in their development policies thus stemmed not from the lack of interest, but from the lack of resources.

An important turning point in this context was the report of the World Commission on Environment and Development. This report introduced the concept of 'sustainable development' and showed how environmental quality and economic development were not only compatible but 'inexorably linked'. And this view was endorsed in Rajiv Gandhi's address on Environment and Development at the UN General Assembly, when he reiterated "we are a strand in the single fabric whose warp and weft link together all that is of the earth, the water, the air," and

¹²Desai, Nitin, 'Poverty & Environment in Africa: What can be Done?'. p. 16.

... "the development which destroys the environment, eventually destroy development itself."¹³ When the environment is not protected, damage to the environment will extract its price - from those living in the vicinity, from others at a distance, or even from coming generations. Hence, there should be a right balance between the environmental imperative and the demands of development.

Respect for all life is a part of Indian philosophies from as far back as there is recorded history Hinduism, Buddhism and Jainism all preached non-violence and reverence for living creatures. The much quoted Ashoka edicts were an exemplification of this philosophy. Despite this pro-nature, pantheism in Indian culture and Gandhian outlook, in the first half of the 20th century much of the environmental debate in India followed the trends set by the colonial masters. Conservationists were preoccupied with game and fish and the stocking of hunting compartments. In the 1st and 2nd Five Year Plan, India tried to emulate the Russian pattern of industrialisation, one that had led in crucial respects to a neglect of environmental consideration. This was done with the belief that heavy industry would provide employment and stimulate the other sectors of the economy. In the 3rd Plan, followed by Annual Plans and 4th Plan there was increasing emphasis

¹³Text of the PM, Shri Rajiv Gandhi's address on Environment & Development at the UN General Assembly, New York, 19th Oct., 1987.

upon the agriculture and a Green Revolution. The thrust was towards the reduction of the gap between the agriculture and industry, and rural and urban, without any concern for harmony between environment and development. It was in the Sixth Plan which provided for a systematic formulation on environment.

Recently, in India there's a growing awareness of the symbiotic relationship between the protection of the environment and sustainable development. There is the renowned Chipko Movement in the Himalayas, where women prevent the wanton felling of trees by throwing themselves protectively around tree-trunks. Island communities join hands to stop the coral-mining which destroy their lagoons. Thus, "the intensity and range of ecology movements in independent India have continuously widened as predatory exploitation of natural resources to feed the process of development has increased in extent and intensity".¹⁴ In our Parliament, members are increasingly receptive to environmental concerns. They are beginning to demand that the conservation of the environment be guaranteed before major development projects are undertaken. And now it has become a policy per se, which is quite obvious from the fact when the work in the Chilika Lake Development Programme was stopped as it has not got the clearance of

¹⁴Shiva, Vandana et. al., 'Ecology & the Politics of Survival : Conflict over Natural Resources in India', New Delhi, Sage Publication, 1990, p. 19.

the Ministry of Environment.

Since 1971, the Government of India has taken commendable initiative to inject environmental considerations into the process of planning for national development. These included comprehensive preparatory activities for India's participation in Stockholm Conference, 1972 and the setting up of National Committee on Environmental Planning and Coordination, constitution of state environment committees, enactment of Constitution (42nd Amendment) Act, 1976 in order to mandate the state to endeavour to protect and improve the environment and to safeguard forests and wildlife, as formulated in the Directive Principles (Art. 48A); enactment of laws for environmental protection such as Environment Protection Act, 1986 and eco-development laws. All of these are indicative of Government's recognition of the need to check environmental degradation and to plan for environmentally sound development.

Thus, in the formulation of development policies there is a great emphasis on the environmental concerns. Its quite obvious in the 8th Five Year Plan document in which it is mentioned that mining projects should be sanctioned in future keeping in view the vulnerability of the proposed location from the point of view of the environment. An action plan will be drawn up for the old worked out areas for restoration and control of subsidence. The 8th Plan

will address itself to the issue of adverse impact of power projects directly and provide necessary safeguards so that environmental safety and stability may be ensured in implementing power projects in the future. And it also envisages the environmental assessment of all the development projects and the pursuit of economic development should not be socially and environmentally destructive.¹⁵ And this growing concern for environment which is manifested in the formulation of development policies can be attributed to the negative externalities of industrialisation, Green Revolution, multi-purpose dam projects, deforestation and social forestry, urbanisation etc.

Industrialisation has been recognised as one of the major factors contributing to environmental degradation. With rapid industrialisation, industrial wastes have also been growing in volume leading to the environmental degradation. Its the chemical plants which release many poisonous gases that pollute the air, sometimes, leakage or burst causes a great damage. And its obvious from the Bhopal gas tragedy which occurred due to the leakage of MIC. gas from the Union Carbide Plant showing the negative externality of industrialisation. Notwithstanding, the Chernobyl disaster, the Indian nuclear estate is going on extending itself even though there is horrific details on

¹⁵8th Five Year Plan Document.

radiation leaks at Tarapur. The use of refrigerants, CFCs, fire extinguishers and propellants in aeroplanes causes ozone depletion. The ozone depletion increases ultraviolet radiation reaching the earth which will curtail crop production and destroy the larva of some marine organisms. Its the carbon dioxide and CFCs like Freon are responsible for the green-house effect. And the industrialization is creating water pollution and as much as 70% of the available water in India is polluted.

Green Revolution was designed as a techno-political strategy for creating abundance by breaking out of nature's limits and variabilities. Vandana Shiva, in her book entitled 'The Violence of the Green Revolution' shows how the 'quick fix' promise of large gains in output pushed aside serious pursuit of an alternative agricultural strategy grounded in respect for the environmental wisdom of peasant systems and building an egalitarian, needs oriented agriculture consistent with the village-based endogenous political traditions of Gandhism and shows how the Green Revolution also contributed to the acute social and political conflicts. According to her, "the conflicts and violence in contemporary Punjab is due to the ecological and political demands of the Green Revolution as an experiment in development and agricultural transformation."¹⁶ The Green Revolution was based upon the

¹⁶Shiva, Vandana, *ibid.*, 1991, p.11.

assumption that technology is a superior substitute for nature, and hence a means of producing growth, unconstrained by nature's limits and thus leads to the creation of technology which create new scarcities in nature through ecological destruction. The reduction in availability of fertile land and genetic diversity of crops as a result of the 'Green Revolution' practices indicates that at the ecological level the Green Revolution produced scarcity, not abundance. In indigenous agriculture, cropping systems include a symbiotic relationship between soil, water, farm, animals and plants. Green Revolution agriculture replaces this integration of inputs such as seeds and chemicals. The Green Revolution varieties need much more water than indigenous varieties. The intensive use of water also has major ecological impact. The dramatic increase in water use with the Green Revolution has led to a total destabilisation of the water balance in the region. The water cycle can be destabilized by adding more water to an ecosystem than the natural drainage of that system. This leads to desertification through water-logging and salinisation of the land. According to the National Commission on Agriculture 13 m.ha. have already been lost to agriculture.

For many decades, and especially since independence, plans for utilising India's water resources for irrigation, power generation, and other purposes has envisaged the

construction of multipurpose dams. The dominant ethos was 'big is best'. It was felt that the process of development entails some social costs of disorganisation, dislocation, rehabilitation and resettlement were seldom considered as issues. While the project did increase the area under cultivation and hydro-electric generation, subsequent facts showed that big dams were not favourable. Cost effectiveness was neglected by the late completion of the projects and the resultant cost escalation, the life of the dams shortened by excessive siltation, and extensive water-logging and salination became issues affecting projects. All this, apart from the human problems of vast numbers of displaced people who till now have not been properly compensated for or adequately resettled. The rising crescendo of opposition to big dams has centred on 3 crucial issues:

- (a) The technical relevance and correctness of cost benefit ratios and other projected technical data;
- (b) The ignored costs of rehabilitation, dislocation and resettlement;
- (c) The relevance of the present model of development in terms of the conservation of environment.

For example, the Narmada Project envisages a series of 30 major, 135 medium and 3000 minor dams and its tributaries. The two main dams are the Narmada Sagar Project in M.P. and the Sardar Sarovar Project in Gujarat.

The present estimates for the NSP and SSP are Rs. 3450 crores and Rs. 12000 crores respectively. The Gujarat government claims that the SSP will irrigate 0.12 m.ha. and generate 1000 MW of electricity. The figures for the NSP are 1.9 m.ha. and 1450 MW. But the cost of loss of forests as estimated by the Ministry of Environment and Forest is Rs. 8,190 crores for the SSP and a colossal Rs. 30000 crores for the NSP. Thus, questions have been raised regarding the economic viability of the dams. It will lead to the displacement of 83,372 people as per the data available in 1991. Hence, the alternatives to big dams and indeed a megamania India's plans, are not pipe-dreams but viable.¹⁷ They are cost efficient in the long run, less destructive ecologically and can give great economic benefits to the local people.

The Forest Policy of post-colonial India continued on the colonial path of commercialization and reductionism and with it continued the growing denial of people's basic needs, both through alienation of rights and through ecological degradation.¹⁸ India's poverty is closely linked with its increasing deforestation and land degradation.¹⁹

¹⁷Suresh, V., 'Development or Destruction', Mainstream, Feb. 24, 1990.

¹⁸Shiva, V., 'Conserving India's Forests, Protecting India's People', Indian Jr. of Public Administration, Jul-Sept. 1989.

¹⁹Chowdhry, K., 'Structural Changes for Better', The Hindu, Survey of the Environment, 1992 p.31.

As much as half of the 329 m.ha. is considered degraded in one form or another. Satellite imagery between the '70s and '80s revealed that forests were losing tree cover at the staggering rate of 1.3 m.ha. a year. Out of the 75 m.ha. of forest under forest management, 40 m.ha. are now without tree cover. In India, the National Forest Policy passed in 1952 stipulated that 60% of the hill and mountain regions and 33% of the rest of the country should be under forest cover. Yet 85% of the country has very little or no tree cover. Deforestation areas has led to massive soil erosion and siltation. According to the Centre for Science and Environment approximately 53% of India's total land area suffers from serious environmental damage. The bed of the Ganges has risen by 0.5m. in the past few years. While those of the rivers in the Terai region are rising at the rate of 15-30 cm. per year. The social forestry projects are meant for afforestation and are a good example of single species. Single commodity production plantations based on reductionist models which divorce forestry from agriculture and water management and needs from markets and the government started planting row after row of eucalyptus seedlings. The eucalyptus has destroyed the water cycle in arid regions due to its high water demand, and its failure to produce humus, which is nature's mechanism for conserving water. Greening with eucalyptus is a violence against women who depend on the stability of nature's

cycles to provide sustenance in the form of food and water (Vandana Shiva).

It is in the massive expansion of the Urban centres that the greatest danger to the environment lies.²⁰ In a purely rural environment, land is utilised and classified as forests, land not available for cultivation, pastures and growing miscellaneous tree crops, culturable wastes, fallow and net sown area. Whilst land under rural use is under cyclical utilisation, but when diverted to non-rural use its characters get permanently changed either by scarification through mining, submergence by dams or through diversion to a built environment. It is next to impossible to restore such land to its original use, which means that diverted land is lost forever for such purposes as afforestation, agriculture etc.

Thus, development interventions aimed at commercialisation of natural resources involve a major shift in the manner in which rights to resources are perceived and exercised. It transforms commons to commodities and deprives the politically weak communities of access to resources and robs resources from nature, to generate growth on the market for more privileged groups in society.²¹ The negative externalities of the developmental

²⁰Buch, M.N., Environmental Impact of Urbanisation 'IJPA July-Sept, 1989.

²¹Shiva, V. et. al., *ibid.*, 1990, p. 11.

policies in India led to a serious stress and strain in all the life support systems. Both the human and animal population pressures have reached a level where the flora and fauna, soil and water and also the atmospheric conditions are becoming more and more depleted, polluted and adversely affected. Consequently, in a predominantly agricultural country, the renewable base of land resources has been eroded and environmental degradation has taken place in the name of development. The situation calls for a bold approach to development which should be based on techno-environmental and socio-economic evaluation of each development project, if the human beings are to be spared of the recurrence of tragedies like the Bhopal Gas or Shri Ram Fertilizer Plant leaks or the hazards of river, water or air pollution. The government's increasing concern for environment while pursuing the development policies shows that developmental and environmentalism are not opposed to each other, rather they are complementary.

Chapter - 3

CHILIKA LAKE DEVELOPMENT PROGRAMME

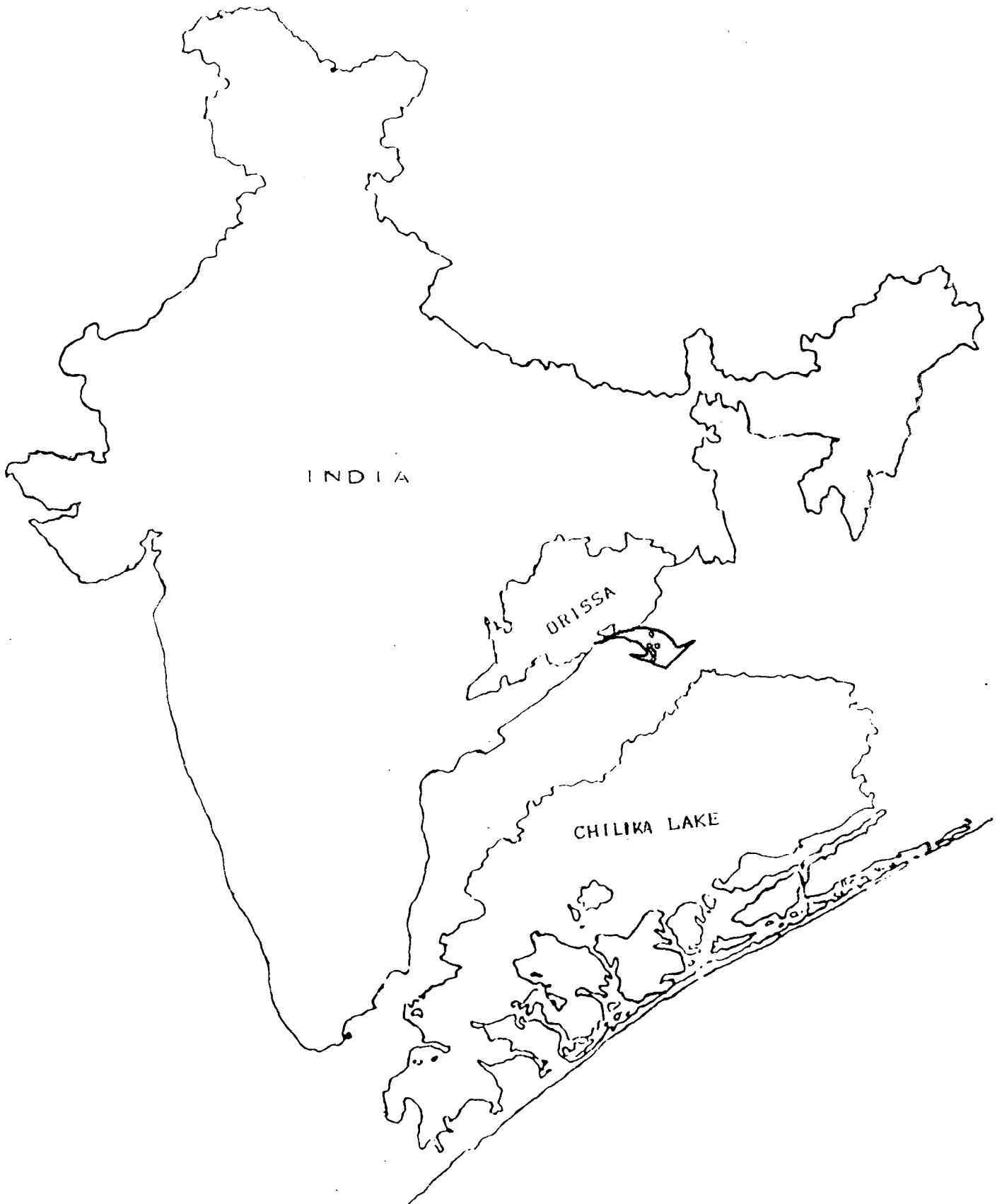
Chilika as a Natural System:

To appreciate any type of human intervention to bring out development in a natural system it is imperative to understand the natural system itself. After understanding the system itself, one can evaluate properly whether the human intervention will make the development sustainable, will save 'Our Common Future' or the development will lead to destruction. Hence, a brief review of the ecological characteristics & important features of Chilika lake which is a wetland of international importance (Ramsar site) is necessary to enable a better appreciation of the impact of the various developmental programmes (ongoing & proposed) undertaken in the Chilika lake area.

Chilika lake is the largest coastal brackish - water lagoon in India.¹ It is the largest estuarine lake of the Bay of Bengal on the east coast of India stretching over three districts viz. Puri, Khurda & Ganjam. It is situated between 19° 30' - 19° 57' N latitude & 85° 5' 20" - 85° 29' 20" E longitude. The lake is a pear-shaped expanse of brackishwater with a waterspread area varying between 1165

¹Wolstencroft, J.A., S.A. Hussain & C.K. Varshney, 1989 Directory of the Asian Wetlands - India, IUCN, Geneva.

GUIDE MAP TO ORISSA CHILIKA LAKE.



sq. km. during rains & 790 sq. km. during summer. But the lake normally covers an area of 1055 sq. km. of which 223 sq. km. is covered by hillocks that lie scattered along the shore line of north-south side landmass. It is about 72 km. long from north to south with a mean breadth of about 25 km in the northern portion & 8 km. on the southern side. The bedrock of the lake being uneven, the water depth varies between 1.73m. & 3.7m. during the rainy season & 0.93m. to 2.6m. during the summer. The lake is separated from the Bay of Bengal by a sandy ridge varying between 100 to 300 yards in width with one natural opening near Arkhakuda which permits the flow of water & migration of fish from the sea to the lake. The estuarine lagoon Chilika which is connected with the Bay of Bengal by a 35 km. long narrow channel from Satapada to Mugger Mukh is being fed by 10 rivers & 25 rivulets & streams. Rivers like Daya, Luna, Ratnachira, Bhargavi & Kania of Puri district discharge their flood waters into the north-east sector, while Malaguni, Dhanua & Salia from Ranpur - Banpur blocks & Khurda district along with some rivulets from the Khalikote block of Ganjam districts pour their water into the central sector of the lake. The lake maintains a sweet-saline ecosystem during the year. It becomes sweeter (less saline) between July & December due to inflow of flood water & becomes more saline between January & June due to the ingress of sea water through the mouth Mugger Mukh. The 300

m. wide shallow mouth at Muggar Mukh helps in discharging the flood water from the lake as well as it allows the ingress of sea water into the lake. The elevated level of Muggar Mukh is only 30 cm deep in summer. As a result, the tidal ingress of sea water has a feeble impact on the lake today. (See Appendix I for other ecological features of Chilika Lake).

Chilika lake has been identified as a 'Wetland of International Importance' at the Ramsar convention, to which the Government of India is a signatory in 1974. Government of India have declared Chilika as a bird sanctuary for facilitating the migration of nearly 132 species of birds from Siberia every winter. The lake is a heaven for migratory birds as it provided food and nesting enterprise for them near the shore, peripheral woods, at Nalabana and other islands like Chadheihaga and Kalijai.

The socio-economic importance of the lake is no less mean, as it is the source of wealth and contributes to the State Domestic Product, foreign exchange earnings, provides livelihood & sustenance to more than 1.5 lakhs of population living in the neighbourhood villages, attracts tourists, houses the Naval Training Centre etc. the lake is important for its fish, prawn & crap population. As many as 158 varieties of fish & prawn are identified.

The physical changes occurring in the lake are

observed to be significant.² The lake is remarkably shallow with the exception of the central sector of Kalijai Ganda and is also getting shallower day by day. Recent studies by the Orissa Remote Sensing Application Centre (ORSAC) through the help of satellite data indicate that the waterspread area of the lake seems to have been reduced from 906 sq km. to 790 sq. km. during the summer in 1986. Heavy silting of the lake through the distributory rivers not only causes the shallowness but also reduces the waterspread of the lake resulting in the formation of landmass in the peripheries. Noticeable changes have taken place in the physical features of the lake comprising bathy-metry, salinity, siltation & weed infestation. The most significant change pertains to an apparent ten-fold increase in weed-covered areas between 1973 & 1985, estimated to be expanding at the rate of 14.6 km of the waterspread of the lake per annum. The weeds & sediments are estimated to have occupied about 400 sq. km. today reducing the waterspread area of the lake to a little more than 500 sq. km. during the summer. Added to all this, is the human intervention by way of overexploitation of fishery resources putting up mud walls/gheribandhas or enclosures by net for pen culture on the fringe & shallow areas of the lake on a massive scale as has been done today both by individual prawn farmers & some corporate bodies

²CIDA: Chilika Lake Project.

like OMCAD, PFCSS & Chilika Aquatic Farm. The matter therefore, has become more complex. Taken together, all these natural & artificial factors lead to a degradation of the eco-system of the lake.

According to Prof. C.K. Varshney, Chilika lake has a distinctive ecological character which has no parallel in the tropical world. He further says, "Chilika lake is very strategically sandwiched between terrestrial & marine ecosystems. Ecologically Chilika lake is a transitory system representing a serial stage of hydrosphere. The natural processes in a normal course will bring about progressive changes in the character of Chilika lake ecosystem over time. Human activities in near & distant watershed areas of the lake, in form of capture & culture fisheries, exert additives or perhaps synergetic influence."³ According to K.P. Biswas, a fishery scientist, "illegal encroaching of Janos & other low lying areas of the lagoon by erecting mud wall & enclosure, not only have a strong ecological impact by cutting off the area from the lagoon ecosystem & prohibiting the same to function as nursery & breeding grounds for a variety of organisms but causing a social conflict between the traditional fishermen of the lagoon & the prawn farmers."⁴ The shifting of the

³Recorded Speech (CIDA: Saving Chilika Lake)

⁴Biswas, K.P.; Environmental Management in Coastal Area - Marine Fisheries, p. 12.

lake mouth, siltation at the Mugger Mukh & consequent reduction in the tidal impact have naturally led to the decline in recruitment of commercially important species of prawns & mullets. "The increase in fishermen population coupled with the rise in protein demand has led to the introduction of modern technology & exploiting hitherto untouched resources. Increased number of traps, especially around the Mugger Mukh, use of nylon nets, indiscriminate catching of fingerlings & gravid females have woefully led to over-exploitation of stocks."⁵ This leads to a question, ' will there be a Chilika, fifty years from now?' So the main objective now is to restore Chilika to sustainability, so that future generations can live of its bounty.

Chilika Lake Development Programme

All lakes die out of natural death as a result of sediment filling & accumulation of dead organic matter. However, this process takes a very long period, varying from several thousand years to even few million years depending upon the size of the lake & other physiographic, climatic & biotic conditions existing. This slow process of ageing can be tremendously accelerated by the enrichment of nutrients of lake water. The consequence of this is the progressive deterioration of the quality of water due to the luxuriant growth of plants with its repercussions on

⁵Bandyopadhyay, S. & Gopal, B. Ecosystem Studies & Management, Problems of A Coastal Lagoon: The Lake Chilika, p. 155.

the overall metabolism of the water affected & this process is mainly attributed to man's activities.⁶ Chilika is the home of over 50,000 fishermen (over 2 lakh total dependents), from 192 villages situated around the Chilika, who are dependent on fishing & particularly prawn-fishing as their major source of livelihood. So people can not be prevented from fishing in order to save the 'common pool resource' & obviously, it will lead to the 'tragedy of the commons'. So, the main objective is how to regulate the fishing sector & prevent the free riders to restore Chilika to sustainability.

Fishing has been the traditional occupation in the Chilika region for centuries. The fishermen trace their rights to fishing in the Chilika back to the time of Afghan rule over Orissa. This right was protected even by the British who aided the fishermen in setting up 25 fishermen's cooperatives, since 1926. Thus, Chilika has a rare & inspiring history of fish producers cooperatives & village level democracy since early times. In post-independence India, the situation continued, with the right of fishing being formally granted by continuously renewed lease agreements to the fishermen. The Chilika Reorganisation Scheme in 1959 made a landmark in the history of management of the sairats in the lake like

⁶Asthana, V., Limnological Studies of Lake Chilika, Orissa, A Project Sponsored Under the Man & Biosphere Programme by the NCEPC, GO1, Dept. of Science & Technology.

'bahani', 'jano', 'uthapani', 'prawn khanda' & 'dian' by Government of Orissa. A cooperative structure was first implemented & strengthened in regard to the lake fisheries, although there was only one fishermen's cooperative society at Balugaon prior to this. A dual cooperative structure was introduced in 1959, with a number of primary fishermen cooperative societies at the grassroot level & an apex society at the top known as the Central Fisherman Co-operative Marketing Society Ltd. (CFCMS). The central society used to take the lease of the various fishery sources from the Revenue Department through the Collectors, Puri & Ganjam & sublease them to the PFCSSs numbering about 48. Those sources which were not taken on lease by the CFCMS were being settled through open auction by the Tahasildars of Puri, Krushnaprasad, Banpur & Khalikote. The 1959 lease policy gave a priority & precedence to the fishermen societies in the matter of leasing of fishery sources through a recognition of the traditional rights of the fishermen.⁷ However, the nonfishermen went on exploiting the fishery sources unauthorisedly. The government failed to recognise the reality of the situation in Chilika. With the growth of population, the non-fishermen could not depend upon agriculture as the only means of livelihood, they had to supplement their family

⁷Report of the Fact Finding Committee on Chilika Fisheries. p. 12.

income through fishing in the lake, which resulted in perpetual conflict with their fishermen counterpart.

A second lacuna is observed in regard to the functioning of the Apex Society (CFCMS), which was commissioned in 1959 with the laudable objectives of a smooth management of fishery sources, marketing the fish catch of the affiliated PFCSs, providing necessary infrastructural facilities for the member societies & also to provide working capital to the PFCSs for purchase of fishing gears & crafts etc. The lease operation by the CFCMS is found to be faulty as there is the lack of a clearcut demarcation of fishery sources in the lake. Besides, the Apex Society did neither have the power to enforce the lease terms nor could it prevent illegal & unauthorised intrusion into the lease areas nor had the power to resolve the disputes over Chilika fisheries. The member societies took the Apex society for a ride, violated the terms & conditions of the lease & with the exception of a few, most of the Primaries marketed their catch directly through the commission agents bypassing the Apex body. In course of time most of the fishermen cooperative societies became sick & moribund & the CFCMS failed to make a leeway in the management of fishery sources of the lake. Thus, the management of fishery sources of the lake was in utter disarray between 1959 & 1988. Hence, a change was introduced in the 1988 lease policy.

The most remarkable change in the lease policy of 1988 is a 3-year period lease operation as against annual lease in the past, clause 12 of the Lease Agreement of CFCMS stipulated: "The sub-lease or the sub-lessees as the case may be are required to operate the fisheries by themselves & have no power to sublet further. In the event of such subletting the sublessee will forfeit the right of sublease & the lessee shall be competent to enter into & take over the possession of the fishery source. Neither the lessee nor the sub-lessee shall be entitled to claim compensation from the lessor in such circumstances." This condition has hardly been implemented by the Central Society & a number of PFCSSs have reportedly sublet their fishery sources to third parties.⁸

The question of rationalising the principles of settlement of fishery sources in Chilika lake was under active consideration of Government And after careful consideration Government issued the following guidelines to regulate the settlement of Chilika fisheries with effect from 1.1.92.

(i) All capture fisheries may be leased out for 3 years with 10% increase every year to the Central Society & primary societies may be allowed to get the sources on the basis of sub-lease from the central society.

(ii) Each primary society may be given a viable culture

⁸Report of the Fact Finding Committee, p. 31.

fishery source on the upset price of Rs. 800/- per acre per annum for a period of 3 years on the stipulation that each year the upset price will be enhanced by 10%.

(iii) No source leased out to a primary fishermen society or society/organisation of villagers comprising persons not belonging to fishermen society may be permitted to be sub-leased.

The highlight of the policy & which is its most criticised part is granting of right to those who are not members of the primary societies of fishermen', & who are 'inhabitants of the neighbouring villages' having formed a society/organisation. thus, non-fishermen's right to acquire lease has been accepted.

However, in the mean time, the year 1977-78 saw the development of prawn as an important export commodity. The name Chilika became synonymous all over Orissa with prawns & money. And with this transformation, the invaders started appearing. First the unscrupulous traders & middlemen, then the politicians with their musclemen. A handful of big business families of Orissa displaced the local fish producers & gained control over most of the prawn & fish trade. And finally, the big industrial houses with the blessings of the state government, which was now very keen to usher in development to the region. The prawn-mania led to certain culture experiments which were taken up in 1981-82 & it showed that the area had a potential to produce

upto 1300 kg/ha. Meanwhile, the government also promoted fresh water aquaculture through the Economic Rehabilitation of the Rural Poor (ERRP) scheme, intended to benefit the rural poor by providing them with tanks or ponds & inputs. While implementing ERRP, in the Palur canal area, the then director introduced tiger prawns into the ponds & the results were surprisingly good. The experiment was so successful that the then Chief Minister J.B. Patnaik, ordered 3,000 ponds should be taken up for prawn culture immediately & another 2,000 the following year. Thus in 1986, the J.B. Patnaik government decided on exploiting the resources of Chilika more systematically & selected the Tatas as a partner in this venture.

The Tata's Project:

The Project envisages the creation of an artificial lake inside Chilika by enclosing the 1400 acre land mass mentioned above with a 13.7 kms. long ring embankment. This artificial lake is to be divided into a number of ponds in which the prawns are to be nurtured & reared commercially. In 1986, the then Orissa Government through Orissa Maritime & Chilika Area Development Corporation (OMCAD) had entered into a deal with the Tatas to lease out 600 ha. of land to the Tata Aquatic Farms Ltd. for 15 years. The present Janata Dal govt. reopened the negotiations & revised the terms in which this 20 crore project becomes a joint venture, Chilika Aquatic Farms Ltd. (CAF). The Government

of Orissa claims that they own 49% of the shares while 48% goes to the Tatas through Tata Steel & Tata Oil Mills. The Revenue department has already leased out 400 ha. of the land in Panasapada village to the Chilika Aquatic Farms Ltd. for prawn culture.

The CAF plans to establish an integrated shrimp farm project at Chilika lake to produce 1500 MT of shrimp per year at a cost of Rs. 1,585 lakhs. the shrimp farm will cover 400 ha. on a mud flat in Chilika lake: a site which normally remains submerged under water during the monsoon months. (See Appendix II for a profile of CAF). The proposed shrimp farm complex will comprise the following four units in addition to an extension service proposed to be organized for the local farmers' cooperatives of Chilika area.

- (a) Shrimp Farm : 400 ha. land area (300 ha. pond area) to produce 1,500 MT of head-on shrimp per annum.
- (b) Shrimp Hatchery : 200-million post larvae (PL-20) per annum.
- (c) Shrimp Feed Mill : To be established in due course.
- (d) Shrimp Processing Plant : To process 1500 MT of shrimp for export, initially, in a leased out plant.

(See the flow chart of the various units, Appendix 111).

The proposed site of CAF on a 1.2 km. wide peninsula near Panasapada village in district Puri, Orissa is shown

in the Fig.1. It seems that the shrimp farm site is outside Chilika lake as the peninsula in the revenue records is classified as Rakhita Anabadi. In fact, the whole peninsula where the CAF shrimp farm is to be constructed is an integral part of the Chilika lake system. The peninsula remains submerged under water to varying periods during the monsoon season. At the proposed CAF site 'trap/hand picking' fishing is carried out by the fishermen in this area. This goes on for two to three months.⁹

A 30 m. wide cut in the peninsula, between CAF shrimp pond 2 & 3 (Fig. 2) will promote rapid drainage of water brought into the lake by Daya & Bhargavi rivers into Bhubania river. The drainage of the lake water through the proposed cut will occur throughout the year & will not be confined to the rainy season alone as mentioned in the CAF report.

Chilika's saline water is to be pumped into the artificial lake by 150 water pumps of 200 horse power each, everyday for 12 to 16 hours, as the culture needs brackish water. While the prawns grow up to 50 grams within 80-90 days. Tata's project intends to grow prawns of 250 gms to 300 grams within 30-40 days. As the water gets polluted with the heavy use of high protein feed, fertilisers, chemicals & pesticides, the highly toxic effluent water from the artificial lake will be drained out through

⁹CAF Project Profile p.8.

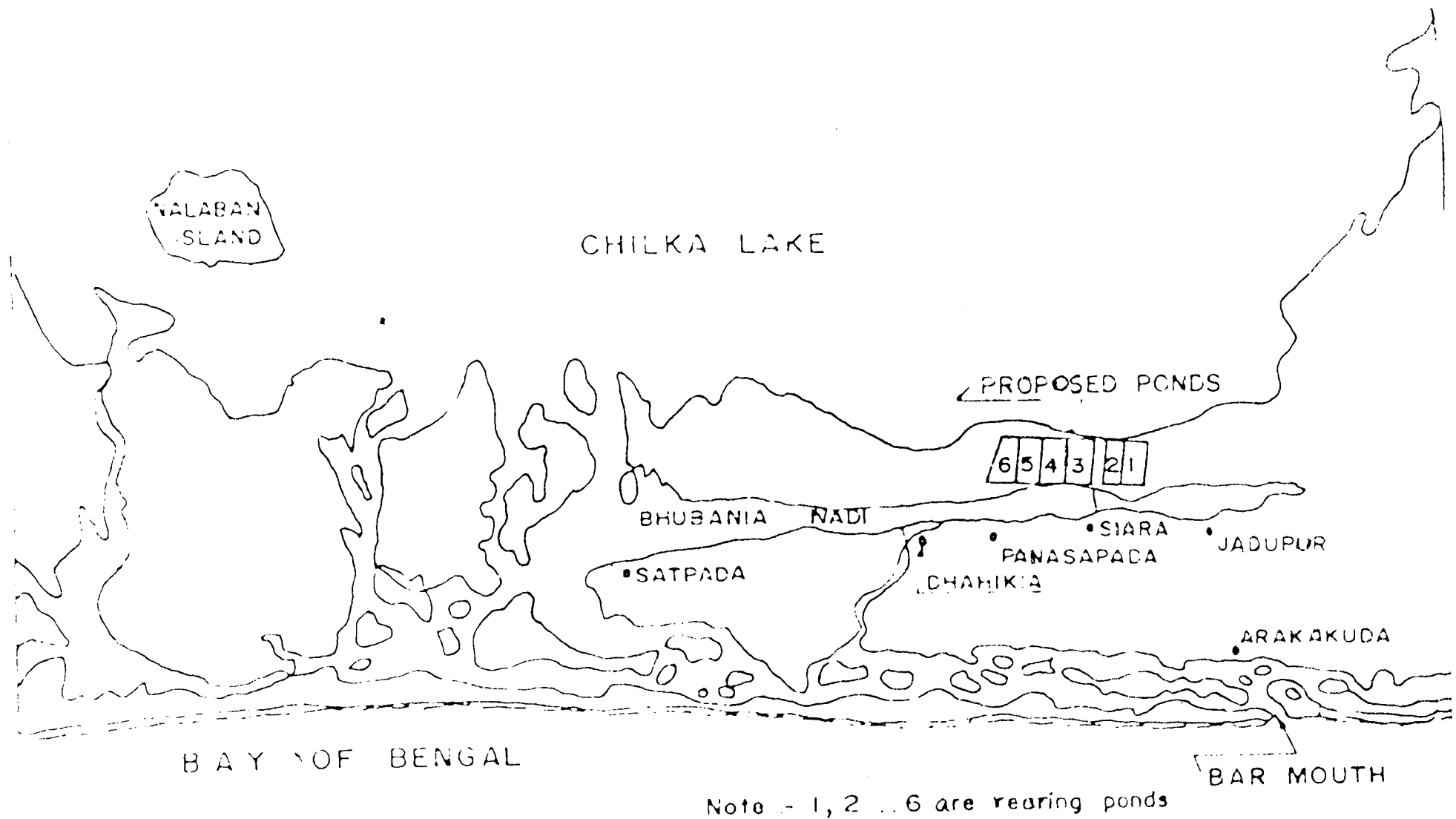
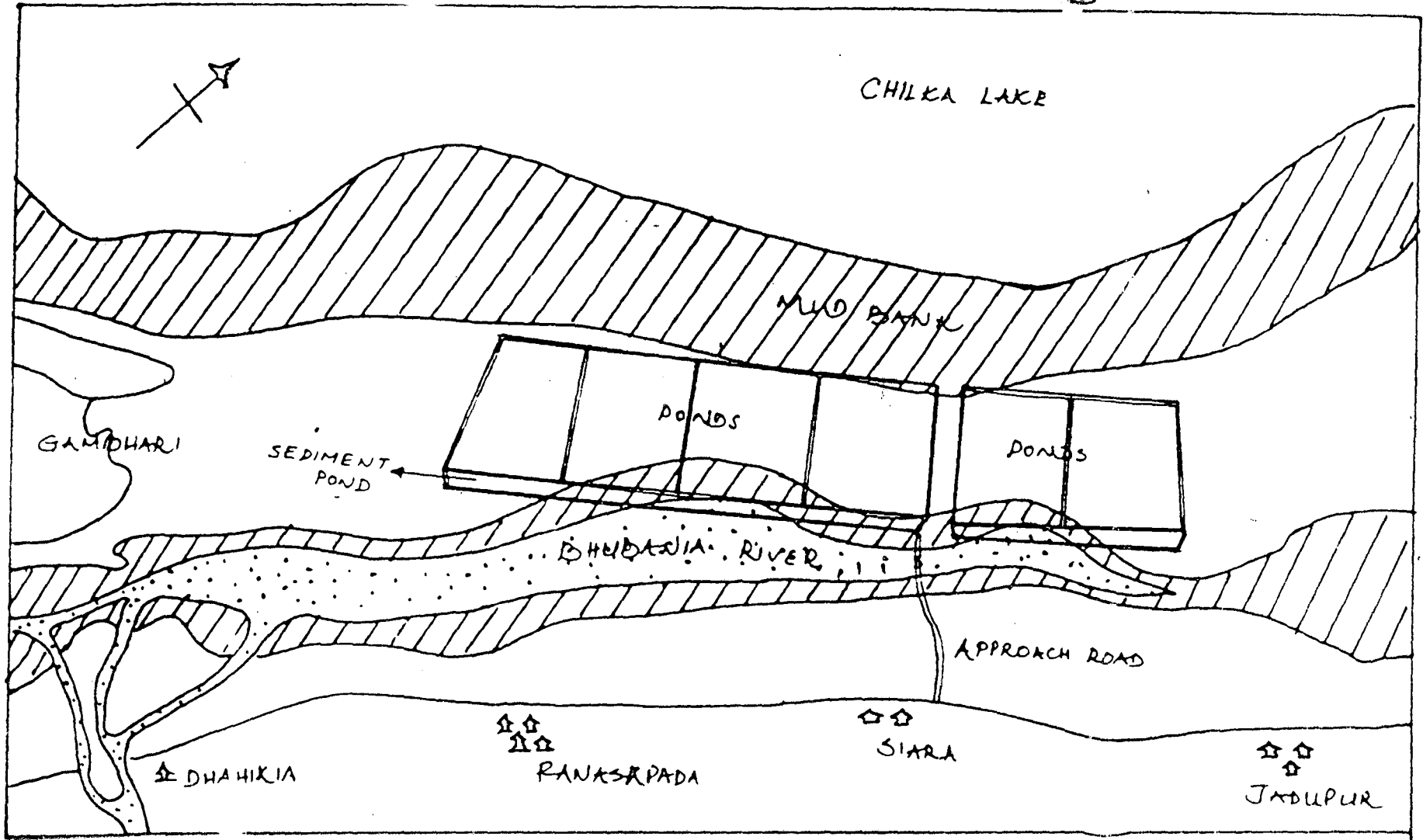


FIG. I LOCATION MAP OF SHRIMP FARMS

SOURCE: TAF 1992, INTEGRATED SHRIMP FARM: PROJECT PROFILE.

FIG.2 LOCATION OF SITE AND NEIGHBOURING VILLAGES



SOURCE: TAF 1992, INTEGRATED SHRIMP FARM: PROJECT PROFILE.

shutters with the help of another set of high power pumps to the Bhubania water channel which is part of Chilika lake system.

The Project, The People and The Environment:

The 20 crore Tata, Government of Orissa joint venture has led to a resistance by the local fishermen community & was supported by the then opposition political party - the Janata Dal. The Janata Dal leader Biju Patnaik had claimed to have taken an oath, with a handful of the water of Chilika, that he would rescue the region from the clutches of the Tatas. The resistance gave Janata Dal all the five assembly seats in the region. However, in 1989, with the Janata Dal coming to power, the situation once again took a change. In 1991, the Orissa government, in a total about turn from the earlier position adopted by the Janata Dal, invited the Tatas to form a joint sector company for prawn culture in the Chilika. Besides, they did not extend the lease which expired in September, 1991 to the fishermen's cooperatives. Instead the government decided to put the fishing resources of Chilika to public auction. And in December 1991, the joint venture with Tatas was allowed advance possession of 400 ha. of Chilika land. In order to augment the position of the foreign exchange reserves of the nation, the steps taken by the Government for Chilika delivered a death blow to the livelihood of the traditional

fishermen. Thus the year 1991 saw the birth of an intense struggle. The fishermen from 192 fishing villages of Chilika united under the banner of 'Matsyajibi Mahasangha' to fight for their rights. They were accompanied in this struggle by 'Meet the Students' a group of students from Utkal University. And it was this united struggle which, on Jan. 15, 1992, at Gopinathpur village saw the formation of a people's movement - the 'Chilika Banchao Andolana' or 'Save Chilika Movement'.

Thus a quite powerful people's movement has emerged in the Chilika over the last two years, to protect it from the commercial exploitation by the big business & to restore to the people their right to manage Chilika. The grievances of the local people are:

1. Within the lease hold land of Tatas (1400 ha) there is a comparatively high land. At that place people anchor their canoes for fishing. More so when the water recedes from that place, people use that for cattle grazing. Now people are getting terribly affected as it has been leased out to Tata.
2. Tata had started constructing a dam across it. Naturally fish will get confined to dam area only. They can not come to other side of it. It also closes the way to Chilika. As a result people can not take their canoes & boats to Chilika for fishing. Obviously it will affect their economic conditions.

3. The rain water of that area & also water of river Luna, Bharvagi & Daya are being drained to Chilika. Because of this construction of embankment the drainage process will stop. Consequently, agriculturable lands of more than 35000 ha. in 80 panchayats of Kanas, Brahmagiri, Sakhigopal & Krusnaprasad block area will be submerged under water for longer period.
4. Information from the project report of the CAFL reveals that contrary to the claims of the Tatas, employment will not accrue, to the local population, in any significant manner. Technology intensive & labour saving CAFL provides a few job opportunities for skilled labour. Transportation, storage & shipment may provide some low employment for the local people as contract workers. No guarantee comes along with the CAFL project to ensure that the opportunities for self-employment through the project's extension service will be made available to the poor fishermen in Chilika & will not be appropriated by the small scale entrepreneurs who now flock Chilika.
5. The local people are apprehensive of Tata's intentions, whether they will ultimately monopolise the prawn trade & whether they will be the ones who determine the price of prawns.

6. The history of the commercialisation of the Chilika lake is also the history of the marginalisation of its traditional fishing communities, as a result of the intervention of the rich & powerful non-fishing communities from outside, who usurped the indigenous people's right over the Chilika's resources. Thus, fishing rights of the traditional fishermen community has been usurped when big industrial houses like Tata entered.

7. According to latest Acts & judgements, the lands under question (the lands leased to Tatas) are explained as common property & thus are not at all leasable.

Besides, the grievances of the local people, the 20 crore Tata, Government of Orissa joint venture has faced the wrath of the environmentalists, as they proclaim that the project has all the potentials to inflict serious damages to the Chilika's ecosystem. From the environmental point of view, the dangers apprehended due to the establishment of CAF are as follows:

1. The rivers entering Chilika carry with them silt which gets deposited mostly at the outlet of the lagoon to the sea. The silt is continuously cleared by the natural dredging process - tidal and monsoon flood. It is essential to ensure that enough river water enters Chilika and a proper balance of sea water and river water is maintained. The Tatas propose to build a ring

shaped embankment, about 13.7 km long, 40 ft. wide and 30 ft. high, on the Bhubania channel, near the outlet of Chilika to the sea. This would seriously hamper the flow of silt-heavy water from the Daya and Bhargavi rivers, and other rivers, which reach the Bay of Bengal through the Bhubania channel and Chilika. the natural dredging process of the channel will be affected. This will have a serious impact on the quality of water on the Chilika and hence the aquatic life and biotic masses it can support. It will spell a slow death of Chilika.

The resultant situation will cause back floods. A survey report by the then Chief Engineer (Irrigation), Banaba Das, claims that around 35,000 acres of cultivable land in more than 80 villages in the region will be inundated for long periods due to back water effects of the flood water.

2. The fish and prawn from the Chilika move from the brackish waters to the sea (Bay of Bengal) through the Magarmukh channel for breeding, and return to the lake along the same channel. The embankment being constructed by the project and the resultant situation will greatly hamper this movement and significantly affect natural regeneration of prawn in the lake.
3. The project will use high protein feed, fertilisers, chemicals and pesticides in the artificial lake for

prawn breeding. The toxic effluents from the artificial lake will be drained out to the Bhubania channel. The resultant change in the life system of the lake will be enormous.

4. A 30m. wide cut in the peninsula, between CAF shrimp pond 2 and 3 will promote rapid drainage of water brought into the lake by Daya and Bhargavi rivers into Bhubania river. This would imply that the movement of fresh water in the rainy season towards the southern sector (where salinity is normally relatively high) of the lake will be considerably weakened and consequently, a major change in the prevailing salinity pattern of the lake cannot be ruled out. The proposed cut in the peninsula will promote drainage of fresh water from the NE sector of the lake into the Bhubania river. Consequently, the biotic community and the productivity of the NE sector of the lake will be seriously affected.
5. The construction of shrimp ponds of 50 ha. each (pond bunds will be 2 to 3m. high and 4 m. wide at the top) will create a lot of disturbances due to the earth work involved. This activity will affect the quality of lake water due to soil erosion from borrow pits and the ponds construction site leading to an increased amount of suspended material in the water body.

6. Water requirement for shrimp culture at CAF will be met by drawing subsoil water. For this purpose 48 wells each with a diameter of 5m. and depth of 5m. are proposed to be dug for extracting water with the help of 144 motor pumps of 10 HP each. The amount of water withdrawal by CAF works out to 65 Mm/gr. The implications of abstracting sub-soil water will be quite severe for the lake hydrology: it will promote water depletion in the NE sector resulting in lowering of the water depth in this sector which is normally the shallow part of the lake. This will adversely affect lake fisheries in the NE sector and the impact will be most pronounced during the summer. Heavy ground water abstraction may lead to subsidence. In Taiwan, subsidence around the Pingtung coastal area during 1970-83 was 0.3-2.0 m mainly due to shrimp and eel ponds.¹⁰
7. In order to energize 144 motor pumps, 720 paddle wheel aerators, lighting other farm operations etc. and 4 diesel generators of 75 KVA each will be installed. The diesel consumption will be 6912 litres/day. The noise caused by generators, pumps and aerators as part of the operations will be an important aspect for consideration in an environmental appraisal of the

¹⁰Alagarwami, K., 1993. Impact of Aquaculture Operations on the Environment, Paper Presented at SCICI Seminar on Aquaculture & the Environment held at Hyderabad.

project, as persistent noise pollution will have an adverse effect on waterfowl and will also undermine the aesthetic, touristic and wilderness values of the lake.

In order to evaluate a priori the possible adverse impacts of the anthropogenic activity on the environment of Chilika an environmental impact assessment was undertaken.

The underlying assumption is that it is possible to assess the environmental damages by scientific techniques before a project/programme is implemented and if such an assessment indeed brings out severe consequences, the activity as such could be scrapped or modified so as to minimise the environmental damages. Consequently, the environmental impact assessment study was commissioned by the project and the assessment was done by a public sector organisation - The Water and Power Consultancy Services (India) Ltd. (WAPCOS). In September, 1992, the WAPCOS came out with a report that the positive impacts of the farm outweighed its apprehended negative ones and that the project would not harm the lake's ecosystem. The report, while giving the project a clean chit, totally ignores the two vital aspects of the project - its impact on the livelihood of fishermen of that region and the impact of the embankment on the surrounding regions. The impact of CAF effluent on the water budget of the lake and possible changes in the water flow pattern at Maggarmukh and in the

outer channel have not been examined. The WAPCOS report does not foresee the impact of noise on the highly noise sensitive migratory birds on the Chilika lake. Concerned about the likely impact of CAFL on the economy of Chilika, WWF India has undertaken an independent assessment of the ecological implications of CAFL. The report describes the WAPCOS report as "overly preliminary and inadequate to make decisions on the projects environmental acceptability."¹¹

However, in the meantime, the Orissa High Court has ordered the setting up of a five-member fact-finding committee headed by Dr. G.S. Das. The report reveals that the massive adoption of extensive and intensive culture fishery for prawn culture is positively harmful to the lake environment and will lead to a massive degradation of the eco-system of Chilika, although the extent of the environmental hazards and damage in case of the former is relatively less than in the latter case provided extensive culture fishery is confined only to the fringe areas of Dian and Uthapani in the lake by pen cultures.¹²

The Ministry of Environment and Forest has still not given its clearance. In fact, at a high level meeting in

¹¹Varshney, C.K. Integrated Shrimp Farming Project at Chilika lake: Ecological Implications & Critique of Environmental Management Plan, for WWF, India.

¹²Report of the Fact Finding Committee on Chilika Fisheries.

August 1992, the Environment Minister Kamal Nath had said that he would initiate another enquiry into the environmental aspects, and made it clear that work on the project must stop. The construction work had been suspended on the advise of the ministry. However, till that period two shrimp ponds had already been constructed with permanent bunding out of the proposed six ponds of the project.

Chapter - 4

"SAVE CHILIKA MOVEMENT":

A FIELD REPORT

"We are after all fishermen. Who will hear our voice? Our nets are very small. Our rights are not even a fistful. Tata is big, very big. Who can fight with it. Then there is Peerless, ITC, Hindustan Lever. And even if they are not there, if Jagannath (the Lord), says go and they go, there is Tara Patnaik and Purna Patra. And Ladoo Patra, Vijay Das, Bhajdas, Tina Das, Uma Mishra and Sanjay Sandra. Chilika belongs to them, Chilika belongs to J.B. Patnaik, Biju Patnaik and Banka Behary Das. To the leaders who are in the pockets of the rich. Our Chilika is no longer ours. Sunk in the noise of bombs, guns, murder and rape, our mother is no longer ours. Chilika does not belong to the fishing people."

("Fishing People of Chilika," Jansatta, Nov. 16, 1992)

In the wake of this feeling of loosing their traditional rights over their own common property resources due to the developmental processes, a powerful people's movement has emerged in Chilika over the last two years to protect it from commercial exploitation by big business,

and to restore to the people their right to manage Chilika. In the name of SAVE CHILIKA MOVEMENT or, Chilika Banchao Andolan, the movement gives the call of 'Fishing people of Chilika unite, you have nothing to lose but to regain your own Chilika'. The Chilika struggle seems to be a struggle of the poor against 'development'- form of development which threatens to leave them destitute and exiles from land which has supported them and from which they eke out their livelihood and coexisted with them for centuries.

The people of Chilika have continuously questioned the objectives of development - is it to remove poverty or to remove the poor? Is it to make the development sustainable or will lead to development of underdevelopment, exploitation and displacement? The objectives of the movement can be further enumerated as:

- Does Chilika belong to the inhabitants of Chilika or to the government? The question of who should own and control local resources is being asked by the local people - the users and protectors of local natural resources - in villages all over India and the world. This is an articulation of the fight between the local people and the government and big business who are mostly from distant cities.
- If multinational companies and large industrial concerns enter into the primary sector of production, where will the farmers, fisherpeople and artisans go?

- What is the primary concern of the state? Earning dollars or extending protection to the right of the people to live?

The movement raised some vital questions about the 'development process' touted by the government and its big business allies. Mentioning about the objective of the movement, Chittaranjan, who has been one of the principal guides of the Andolan since its inception, speaks of "the valuebased alternative that is emerging from the shadow of a decaying valueless capitalism." He adds, "we are not simply resisting development, we are trying also to help set a living example by the way we live. That means a disciplined, frugal, though certainly not joyless life. If the government can not show a better way, it is for the people to do it, and that is what we are doing in Chilika." Another activist mentions that "the fight is of the people for control of the resource-base."

Now, it is important to trace the chronological development and highlights of this movement: - The Matsyajibi Mahasangha, an organisation of the fishing community of Chilika, had consistently protested against the Tata project, and against any step by the Orissa government to take away the rights of the fishing community over Chilika.

A batch of students from "Meet the Students Working within the campus to bring a value-based Change in Society"

(Meet the Students), a group active in Utkal University joined the struggle in August 1991. A series of meetings under the auspices of Matsyajibi Mahasangha were convened in areas that would be directly affected by the Tata Project.

- August 13, 1991: A meeting of intellectuals and supporters at Puri led to the formation of a platform "Chilika Surakshya Parishad" to coordinate activities. The cause also received support from democratic rights organisations like Swadhikar and Ganatantra Adhikar Surakshya Samiti.
- September 20, 1991: This was the day on which the three-year lease to the fishermen's cooperative societies was due to expire. About 8,000 fisherpeople from Chilika came to Bhubaneshwar and gheraoed the assembly which was in session. The Fisheries Minister had to come to talk to the people on behalf of the Chief Minister. The grievances of the people were given to him in writing. The Minister assured the people that not even an inch of Chilika would be leased out to the Tatas. Consequent to the demonstration, the Orissa government also constituted a committee under the chairmanship of the Chief Minister and including MLAs from Khurda, Brahmagiri, Chilika and Chatrapur and representatives of Matsyajibi Mahasangha.

- January 15, 1992: At a meeting of representatives of fishermen villages in Gopinathpur village, the Chilika Banchao Andolan was formed with a 55 member executive committee from among local fisherpeople. Mr. Gopinath Behera of Gopinathpur village was elected the convener.

A state-level activist forum of students, the "Krantidarsi Yuva Sangam" was formed. Meet the Students, remains a university-based students forum. At present, 24 fulltime activists from Krantidarsi Yuva Sangam are working in Chilika.

- January 22, 1992: People objected in the court of the Revenue Divisional Commissioner (RDC) against advanced possession of the land given to the Tatas by the Orissa government. A stay was obtained from the RDC, on February 2, declaring the advance possession as void and restricting the Tatas entry to the disputed land.
- February 14, 1992: Over a news report, by the Krantidarsi Yuva Sangam in newspapers in Orissa on that day that "Tatas are stealing prawns in Chilika", which revealed many facts including Tata's illegal encroachment, unauthorised embankment construction and prawn rearing, there was a furore in the state assembly. 17 MLAs cutting across party lines demanded an answer from the Chief Minister. The Fisheries

Minister agreed (contradicting earlier statements) that no formal lease had yet been given to the Tatas. He, however, denied that any structure had been constructed by the Tatas on the disputed land.

- February 16, 1992: A gathering of 5,000 people consisting of fishermen and women, non-fishermen, students and intellectuals took possession of the Tata-occupied Chilika area. they hoisted their own flag and declared a "people's curfew" in the area. Village heads from 62 villages pledged to continue their fight against Tata's illegal occupation of Chilika.
- March 7, 1992: A rally of 1,000 women marched towards the Tata site with the intention of breaking the embankment.
- March 15, 1992: A rally of about 6,000 people from Chilika villages marched to the Tata site and broke the embankment. Neither the presence of four platoons of police force, nor physical assaults by prawn mafias could stop the people.
- March 25, 1992: People set up a check gate to obstruct the movement of Tata vehicles. It was removed later.
- March 28, 1992: Another people's march to the Tata site was announced. A batallion of 11 police platoons was deployed to stop the march. The police resorted to lathi-charge, 69 fisherpeople, including 33 women and

six children were arrested. In spite of such fierce repression, the people continued with the act of demolishing the embankment.

- April 4, 1992: Mr. Chittaranjan Sarangi, a leader of the Movement was arrested. About 600 students of the Utkal University gheraoed the District Collector of Puri, demanding the release of the arrested fisherpeople and Mr. Sarangi. On pressure from the students, they were all released on April 9.
- April 19, 1992: A number of Sarvodaya leaders, in a public meeting at Panaspada village near the project site declared their support for the Chilika Banchao Andolan.
- May 13, 1992: A letter was sent to the Prime Minister, signed by 21 MPs, which called for his immediate intervention in restraining the Tatas from executing the project. A memorandum was also sent to the Environment and Forest Minister.
- September, 1992: A convention of representatives from 632 villages in four blocks to be affected by the Tata project was organised by the Chilika Banchao Andolan. At the convention, an alternative master plan was articulated, wherein the traditional fisherpeople would continue their prawn fishing using conventional techniques. Any exporter, including the Tatas could purchase the prawn at competitive prices from the

fisherpeople's cooperatives.

In the last week of September, the activists of Chilika Banchao Andolan and Krantidarsi Yuva Sangam undertook a 15 day padyatra to contact people and activate the movement.

Thus, a quite powerful people's movement has emerged in the Chilika region over the last two years, to protect it from the commercial exploitation by the big business houses and to restore to the people their right to manage Chilika. And in the meantime, the High Court has been approached by 36 primary fishermen cooperative societies against the present principles of settlement of fisheries in Chilika. The Orissa High Court has ordered the setting up of a fact-finding committee for enabling it to decide on three identical writ petitions challenging the constitutional validity of the State Government's new policy on lease of fisheries in the Chilika lake by which non-fishermen had been brought in a big way in prawn culture. A committee was set up under the chairmanship of Dr. G.S. Das, who had made a study of the problems of fishermen cooperatives in the Chilika lake at the instance of the State Government in 1978.

The committee should make a proper study and report, among other things (a) whether the primary fishermen cooperative societies sub-leased the fishery sources settled with them to non-fishermen from 1988 onwards and if

so, the extent of same; (b) what has been the traditional right of non-fishermen regarding fishing in Chilika and since when; (c) how many non-fishermen of the neighbouring villages have taken up fishing as their profession and since when; (d) what has been the role of mafia in the fishing trade and who has engaged them. The committee has also been asked to study whether the traditional sources like Bahani, Jano, Dian and Uthapani been converted into prawn sources and if so, how many and since when. The Committee has also been asked to study whether culturing prawn in the land mass affect the ecology of Chilika.

While the matter was subjudiced, the project failed to get clearance from the Union Ministry of Environment and Forest. In June, 1992, Mr. Kamal Nath, Minister of Environment and Forests had asked the State Government to suspend the ongoing project till the ecological issues affecting the lagoon are thoroughly examined. Consequently, the Water and Power Consultancy Services (India) Ltd. (WAPCOS) in September 1992 came out with a report that the positive impacts of the farm outweighed its apprehended negative ones and that the project would not harm the lake's ecosystem. However, it is the Chilika Aquatic Farm Ltd. itself has asked WAPCOS to conduct its own environment impact assessment. Since the WAPCOS has been employed by the Project itself, doubts have been raised regarding the objectivity of the report.

The WAPCOS report can be faulted on at least three counts. First, it takes the position that the protein-rich nutrients for prawns will not be discharged into the lake because there is no connection between the Bhubania channel and the lake. This is false, as was found during a visit to the lake. In fact, one has to travel by boat to reach the Tata embankment. The report hides the fact that at all times during the summer months the channel is indistinguishable from the main water mass that is Chilika. Moreover, the WAPCOS report makes the rather naive suggestion that "there is no human settlement on the project site. Hence, no population/family will be displaced due to the project." It fails to mention that thousands of people from the nearby villages eke out a living from this portion of the lake. The report also mentions that the project site is located on Rakhita anabadi land and draws the conclusion that this is not grazing land and that the villagers, in any case, do not have any grazing rights over it. What it fails to say probably because this can work against the Chilika Aquatic Farm - is that in the revenue records Rakhita Anabadi means "protected wasteland". In other words, the Chilika Aquatic Farm is located in a protected area inside the Chilika lake.

Thus, in the context of the strong and participative people's movement in Chilika and the wide support it has acquired all over the world and sensing the danger involved

in accepting the report based on half truth, it is learnt, the Union Environment Ministry is not prepared to revoke its suspension order.

However, since the Environment Ministry's will to hold on to its decision to oppose an export oriented project by a leading industrialist is a matter of conjecture and the past experiences like that of the clearance given under pressure to Sardar Sarovar Project shows that ultimately it is the vigilance and consciousness of the people that matter, the people of Chilika planned the strategies accordingly. In September 1992, the Chilika Banchao Andolan organised a convention of 632 representatives of villages in four blocks to be affected by the Tata Project. In the convention, was articulated, an alternative master plan for the traditional fisherpeople to continue the natural prawn culture, from whose cooperatives any exporter including Tatas could purchase prawns at competitive prices. In the last week of September the activists of Krantidarsi Yuva Sangam and Chilika Banchao Andolan have undertaken a week long padyatra cum boat yatra into the Chilika villages. Participating in a state level convention in Bhubaneswar, on 2nd November 1992, eminent environmentalists, jurists, social activists and politicians urged the centre, state and the Tatas to 'call off the CAFL project in the larger interests of protecting the ecology of the lake and the livelihood of several hundred villages situated in the

vicinity of the lake. Will the legitimate right of the Chilika fisherpeople to be part of their environment and to manage its natural resources be accepted? And the struggle continues.

The Area Study:

An area study was conducted by the researcher himself to study the 'Chilika Lake Development Programme' from the institutional perspective and to relate the various developmental programmes (ongoing and proposed) to the concept of 'sustainable development' and to examine whether and how this programme contributed in sustaining the process of development in Orissa.

The objective of the study are:

- (a) The researcher in his study seeks to evaluate the Chilika Lake Development Programme from the perspective of 'sustainable development' and to investigate whether the institutions involved therein are working for the development or development of underdevelopment and displacement;
- (b) To evaluate the process of capitalist penetration and state intervention into the artisanal fishing sector from the 'Normative Justification' point of view;
- (c) To explore whether the Chilika Lake Development Programme is a sheer response to the political economy of liberalisation;

(d) To examine the impact of this project on the political affairs and political process of the state and the resulting class conflict in those areas.

The study was done in the background of the current changes that are taking place in the policy perspective and the development strategy. Before initiating the field work process, a review of the existing literature in the form of government document, project report and environmentalists reports was undertaken by the researcher.

The researcher followed analytical and descriptive method in the course of his study. Besides, the researcher followed the natural and non-participant observation method to get the data. The sources of data are from both primary and secondary sources. An open ended interview was undertaken with the help of an unstructured questionnaire to provide an academic solution to the problem of development in consonance with the ecology on the background of the current changes that are taking place in the policy perspective and the development strategy. For the purpose of interview 3 categories of samples were selected viz. (a) The people; (b) The movement leaders; and (c) The Government employees and leaders of political parties.

A three-pronged approach to the interview was undertaken to set up an inter-relationship between people's perception, government's and political parties' leaders'

attitude and the movement leaders' approach to solve the problem. The sample for the first category, that is from the people of the villages contiguous to Chilika, were selected based upon certain criteria viz. members of the defunct cooperative society and members of the fishermen and non fishermen community who eke out their livelihood from Chilika. Few of the government employees, who are directly involved in the Chilika Lake Development Programme. The present Chief Minister Mr. Bijoyananda Pattnaik and the former Chief Minister Mr. Janaki Ballav Pattnaik who had initiated the private capitalist penetration into the Chilika lake were selected. The movement leaders were invariably selected from those who are involved at the grassroot level and the ideologue. Few villages were taken for the purpose of selecting the samples depending upon their proximity to Chilika. Thus, the field visits were undertaken with a view to taking evidence from local fishermen and non-fishermen to examine the problems arising out of private capitalist penetration into the artisanal fishing sector.

It was a micro-level study requiring extensive and intensive dialogue with the people of different villages. Hence, the first level of respondents were the people of different villages and these people were the key informants. Discussions with them both individually and collectively gave a general understanding of the villages,

about the people and their expectations from and perceptions, of the Tata Project. Since, the implementation of the Tata Project has stirred the hornet's nest in those areas, everybody was well aware of the Tata Project. The second level of respondents were the leaders of the 'Save Chilika Movement'. The interview took on a more formal tone as the leaders would not want their answers to be neither in favour of the Tata Project nor the Government of the State. Another level of respondents were the policy formulators at the state level including the Chief Minister under the aegis of whom decision is being taken for allowing non-fishermen communities and private capitalist like the Tatas to enter into the race for earning 'prawn-dollars'; and various leaders of other political parties were interviewed.

DATA ANALYSIS:

- (a) The perusal of the State Government's attitude to the intervention of private capitalists in Chilika reveals the following facts: State government takes the plea that prawn is a highly profit making business due to its export possibilities. Modern intensive culture of prawn can multiply the present traditional production rate by 60 times, assuring a fascinating amount in foreign exchange to the state. They say that it will not hamper the fishermen's interest as fishermen do

not, generally, cultivate prawn in Chilika. the waterland which Central Marketing Cooperative Society was getting on lease from Revenue Department was leased out again to Primary Fishermen's Cooperative societies. But these Primary Fishermen's Cooperative Societies, instead of cultivating their own, re-leased it out to small prawn traders. And these small prawn traders drew the entire benefit; neither the fishermen nor the State government got the money. the deposit of lease money was very irregular. The entire Chilika has been drawn to bloody clashes, and chaos prevails in the area. So, the multinationals and big industrial houses would oust small prawn mafias from the picture, provide employment to the fishermen and heavy income to the State. Moreover, the Tatas, the present actor would be purchasing prawn from the fishermen at a reasonable rate.

- (b) Mr. J.B. Patnaik, the ex-Chief Minister, who was at the helm of affairs in taking the policy decision of allowing private capitalists like the Tatas for earning 'prawn-dollars and now opposing the implementation of the project tooth and nail. According to him, the decision was taken based upon certain norms and conditions viz. (i) it will remain confined to certain areas; (ii) it will ensure the protection of the environment and will establish

laboratories for research and development; (iii) people's cooperation is to be ensured so that the Tata Project will provide the local people seeds, employ them etc. But none of the conditions that had been set by the then government while taking the decision have remained unfulfilled by the Tatas. Hence, the project have been opposed by the Congress (I). He alleged that the present government in collaboration with private capitalists adopting anti-people measures and the coming election for the State Assemblies will prove this. In all the Legislative Assembly seats of the Chilika region, the Janata Dal has won on the plea of driving-out the Tatas. But after assuming power, it is the Janata Dal government who is imposing the Tatas without caring for the interests of the people.

- (c) However, the 'Save Chilika Movement' leaders when asked about the prevailing chaos allege that the responsibility for this chaos lies not with them but with the faulty policies of the State Government. According to them the root cause of crisis in Chilika is the anti-people policy of the State Government. In spite of the economic and biological significance of Chilika, there is no clear cut policy on the lake. Administratively, Chilika and its people have to face the uncoordinated and dubious dealings of five departments namely; Revenue, Forest, Police, Judiciary

and Tourism.

As they say, until arrival of prawn cultivation everything was going well with the Central Fishermen Marketing Cooperative Society. They took lease of all 315 fishery sources in Chilika and was sub-leasing it out to Primary Fishermen's Cooperative Societies for long thirty years and revenue earnings were satisfactory. Scenario started changing since mid-80s when prawn culture was introduced by State government through training and inducement. But it demanded heavy investment which PFCSS could not arrange. Government neither directly nor through the banks did come to their rescue. Banks denied loan, as fishermen did not have any permanent holding or any long term authority on land other than the one year lease possession. So the fisherman starved off from cash were persuaded by the businessmen from towns to take loans from them on heavy interest, or to sub-lease the land to them. In that way most of the waterbody went into the hands of prawn businessmen. Under pressure from the prawn mafia, the government started neglecting the effective functioning of the cooperative societies and became an onlooker to the deteriorating situation of the fishermen.

ROLE OF SOCIAL FORCES: At this juncture, another force started exerting itself: the upper caste inhabitants

around Chilika who are non-fishermen. And prawn mafias supported fishermen from behind the scene. The traditional fishermen who were the losers in the allotment of surplus land and non-fishermen who were the gainers started bloody battles for the possession of the land leading to social unrest.

At this critical situation, in 1988, Tatas arrived at the scene. The then Congress government signed the agreement with the plea that Tata's entrance will stop all these disturbances. There was a great uproar, which was picked up by the Janata Dal as an election issue. The uproar was mostly from the non-fishermen who also being comparatively more conscious, could foresee the bleak future of Chilika. Janata Dal became the representative of non-fishermen who constitute 60% of the total population around Chilika. Thus, all the seats previously in the hands of Congress I went to Janata Dal. Once in power, the government expressed its inability to get Tatas out, but took serious measures to deprive and suppress the fishermen only to satisfy non-fishermen. The crisis assumed alarming proportions with the legislation allowing the entry of non-fishermen in culture fisheries in Chilika and also with the dissolution of CFCMS. Thereby, the traditional occupational rights of Fishermen's Cooperatives were rejected and the leasing

power are vested with the Tehsildar, Puri. By the end of 1991 the situation was such that not a single week passed without a riot or murder.

The government has increased 20 times the lease money per acre from Rs. 40/- to Rs. 800/- with the argument that the Tatas are ready to pay Rs. 834/- per acre. But the government did not extend the other facilities that were given to the Tatas. Besides, the government has divided the entire Chilika into two segments: (1) Culture source - highly productive area, which goes to the non-fishermen mafia and industrial houses and (2) capture source - much less productive areas which are granted to the traditional fishermen. Even those capture source areas are also in the possession of non-fishermen.

According to Chittaranjan Sarangi "the Tata's entrance would be a death blow to the Mafia", as proclaimed by the government, "is a false statement". It is through these local prawn trading companies that Tatas are purchasing prawn from the fishermen. Bijoy Marine Products (P) Ltd., leading traders among these, earn Rs. 5000/- per day as commission as middlemen, besides profit they earn from the transaction. This disproves the Tatas claim that fishermen would get higher price for prawns if sold to the Tatas. The Memorandum of Understanding between the State

government and the Tatas have been challenged by him. The state government's claim that it has 49% share in CAFL is confusing. The total project cost of CAFL is Rs. 20 crores. The CM told the Assembly that Government will not involve its share in cash. Tatas have been asked to deposit the leased money of 1400 acres at Rs. 834/- per acre for 15 years, in advance, which will be taken as government's investment in CAFL. However, the amount comes to Rs. 1,75,14,000/- less than 10% of the total cost. And Tatas are not the only threat to Chilika. Indian Tobacco Company, Hindustan Lever, Union Carbide and Pearless are already in the line. Hence, according to Chittaranjan the movement's approach is never negative i.e. 'Tata Hatao', rather it has a lot of constructive objectives viz. (i) people's control over the natural resources; (ii) enhancing the process of social transformation, making people conscious against the Mafiaraj and making the movement a mass mobilization challenging the entire system; (iii) united struggle for righteousness and providing social justice to the poor.

According to Banka Behari Das, "Tata hatao" was the immediate objective of the movement, whereas the other objectives of the movement viz. protection of the environment and encroachment hatao remain

unfulfilled. According to him the Government has not only failed to protect the ecology of the lake but is also going against its obligation under the Ramsar Convention on the conservation of wetlands instituted in 1971. People's consciousness is necessary for making the development sustainable.

However, the leadership of the movement seems to be in crisis. One group opposing the other one, blaming them for muddling the main issue and ciphoning off money from the Tatas and other private capitalists. Thus, a mistrust has arisen between different leaders which is a setback for the movement itself.

- (d) A mere visit to different villages and an extensive and intensive dialogue with various people reveal that while some villages opposed the Tatas vehemently, the others supported it as they were benefitted due to the Tata's presence. Particularly, the fishermen community were supporting the Tata Project on the following ground: (i) The Tatas were providing a good rate for their prawns that they capture; (ii) The Tatas will provide them seeds and will purchase it later on and will ensure current payment; (iii) Cooperatives were cheating them; and (iv) When the Tatas are there, their presence will lead to better infrastructural facilities in terms of road, transportation, power,

better health facilities and education. And when the Tatas came they were working for all these things.

However, even in the villages, where people were opposing the Tatas, the fishermen community supported the Tatas, even though it was not manifested in their activities. In these villages, the fishermen community either remained quiet or supported the movement which is mainly led by the local elites of the non-fishermen community, out of fear and common village interest. But when the fishermen community realised that, it is the local elites who are reaping the benefits of the movement when the Tatas left the place, even though unofficially, they started opposing the movement. The local elites, as the people reveal, are planning to encroach the 13.2 km. embankment created by the Tatas for their own prawn culture.

They also admit that the fish catch has come down because more and more people are fishing in the lake. And, since the prawn is so expensive, Rs. 270/- per kg. neither they can keep some for their own consumption nor they can prepare 'sukhua' (dry fish) as they used to do earlier. Besides, the non-fishermen community are catching fish and prawns from their areas illegally through 'khainchis' and 'poluhas'. Even though they protest, they cannot prevent it as they are less in number and there is no unity among

themselves. They do admit that the Mafias are involved in financing them. Hence, it is the middlemen who take away all the profits.

Thus, a sense of fear psychosis, social unrest, exploitation shrouds the Chilika region, where the evaluation of the impact of the Tata Project has to be done from 'normative justification' point of view.

CONCLUSION

Natural systems, have a self-sustaining process of development. If remains uninterfered by human being, it can have a better longevity. However, since there is a symbiotic relationship between nature-man-society, human interventions cannot be prevented. The growing population demands more and more from the nature and when the demand exceeds the carrying capacity of the natural system, question arises regarding its sustainability and maintaining the process of development of the people who are dependent on it. And this is what the case of Chilika lake is. As the field work reveals, there is no such concrete programme as Chilika Lake Development Programme. There is no concern for the development of Chilika Lake as such, but what the development programme refers to is the various leasing policy and the latest being leasing to the non-fishermen and private capitalists like the Tatas for prawn culture and fishery. Since fishery is a renewable resource, it can be safely harvested upto a certain level. As long as 'MAXIMUM SUSTAINABLE YIELD' is not exceeded, the resource is sustainable. The yield of a renewable resource increases steadily upto maximum sustainable yield (MSY) but then drops rapidly, a situation illustrated schematically in Figure-1.

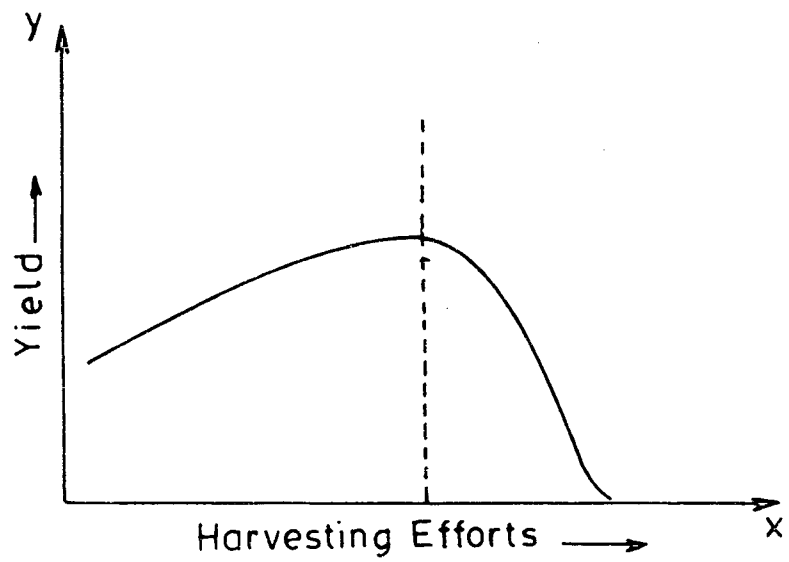


Fig.1 Schematic representation of the relation between rate of harvesting of a renewable resource of yield.

Chilika lake is a form of common pool resource, where exclusion may be infeasible in the sense that many users cannot be denied access. A cost-minimizing individual has an incentive to take advantage of whatever is available out of nature's bounty without paying a price or contributing a proportionate share of the effort to supply a public good. So long as voluntary choices apply, some individuals will have an incentive to act as 'free-riders', taking advantage of whatever is freely available and the result, the joint good will inexorably deteriorate. As rational being, every 'free-rider', asks to himself "what is the utility to me of taking one more fish from Chilika"? The negative aspect of this is the overconsumption, which may be a fraction of the whole. Being rational, the person concludes that the only possible course for him to pursue is to add one more fish. And another, and another... But this is the conclusion reached by each and every rational humanbeing sharing a commons. Therein is the tragedy. Each man is looked into a system that compels to him to increase his share without limit in a world that is limited. An informal talk with the people of, Chilika during the field work reveals that the 'free riders' of the village have led to the tragedy of the Chilika.

However, the idea central to sustainable development thinking, is the need to place proper values on the services provided by natural environment. The central

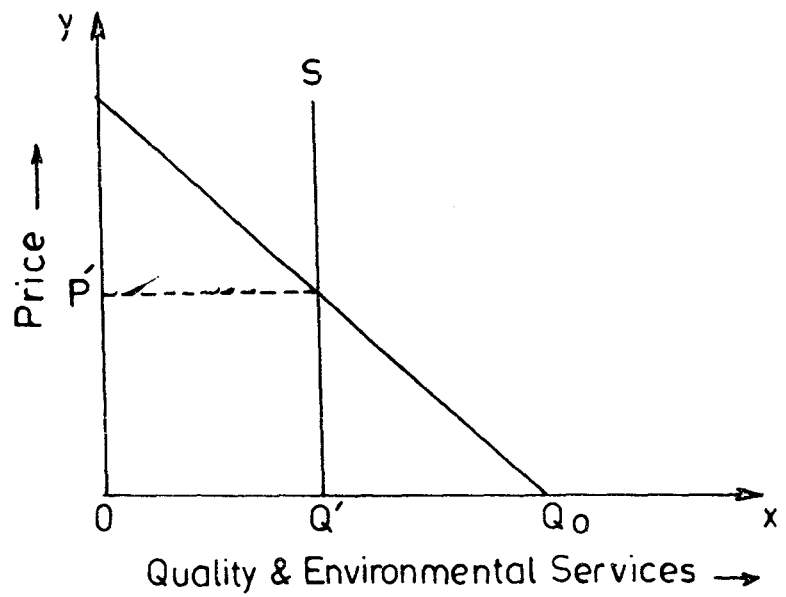


Fig:2 Environmental problems arising from the absence of markets

problem is that many of these services are provided 'free'. They have a zero price simply because no market place exists in which their values can be revealed through market activities. The Orissa government realised this and asked the private capitalists to enter the fray.

The diagram shows the demand, D for the services of a natural environment. If there was a price, the demand would be greater the lower the price. The supply is generally fixed, however. This is shown by the vertical supply curve, S. If there was a market in the environment in question, price would settle at P' - the 'equilibrium price' - and the amount of the environment used up would be Q¹. But, in fact, the absence of a market in the environment means that the price is zero and the quantity consumed is Q₀. But, the people around Chilika have opposed the intervention of private capitalists vehemently. The opposition to the project was so intense that, finally, the Tatas had left the place, even though unofficially. The movement leaders created a sense of fear psychosis in the minds of innocent people that the developmental activities undertaken are meant for their underdevelopment and finally displacement from their own land. But when the Tatas had left the place, the local people alleges that, the local elites who were spearheading the movement against Tatas are planning to capture those areas for their own interest.

Thus, it is obvious that none of the institutions involved therein viz. the government organizations, the market in the form of the Tatas, and the people are really concerned for the development of Chilika. Everybody is in a plan to articulate and maximise their own interest in the guise of protecting Chilika. The government is interested in earning foreign exchange resources; the Tatas interested in getting quick benefits in the form of 'Prawn dollars', and the people, as free riders, are always there with the intention of maximising their advantage at the cost of Chilika. Thus, it is obvious that, the process of so called 'development', has opened up the road to underdevelopment. So, now the main objective is how to regulate the fishing sector and prevent free riders to restore Chilika to sustainability.

Chilika lake issues are extremely complex characterized by a complex set of interrelationships between physical, biological and institutional variables. Hence, an integrated management programme has to be done by taking all the institutions viz. the state, the market and the people for whom development is undertaken into consideration. A new sort of participatory development taking cognizance of the environmental protection of Chilika has to be initiated in which the local people has to formulate the plans based upon the local needs, the Tatas to harmonise the local interest with that of the

market and protection of the environment and commercialise the product and the state has to coordinate the activities undertaken to make the development sustainable. Because, the symbiotic relationship between nature and man demands that any intervention, which may perturb the natural process, should come from the people working at the grass-root level, as they are well aware of the nature's needs even. The market is needed to finance the process and commercialise the product and to reinvest the profit in research and development for the protection of environment and to develop alternative methods of use to make the development sustainable. Due to the scarcity of resources, the state should leave this job to private capitalists and can divert the scarce resources to social sectors and human resource development. In this age of debureaucratization, decentralisation, democratisation and delegation, the state has to play the role of a facilitator, promoter and coordinator than that of a regulator. All the three institutions should be conglomerated into a new form of organisation in which each and every institution while performing the responsibility vested upon them should be made accountable to each other to minimise the tragedy of the commons and free rider problem.

Now, the problem is to evaluate the public policy of capitalist penetration and state intervention into the artisanal fishing sector from the 'Normative Justification'

point of view. Evaluating a public policy from the normative justification' demands that whether, 'the purpose or goals for the policy is normatively justifiable to the relevant public'. A perusal of the area study reveals that the purpose or goals of the policy can be partially normatively justifiable to the concerned people. The policy regarding the intervention of private capitalists like the Tatas are justified by the local fishermen community as they were supposed to get better amenities, even though they had opposed it out of community interest at a particular point of time. At a time when people are more aware of their interests, implementation of any public policy will give rise to protest whose interest is hampered. So, the problem lies in converging the interest of every group to have an integrated development approach so that the policy can be normatively justifiable.

Allowing the Tatas to enter into the artisanal fishing sector can be related to the liberalisation drive. Since from the early '80s the nation has adopted the policy of liberalisation to maintain the depleting foreign exchange reserves and to have a favourable balance of payment position. And it was obvious from the earlier experimentations that the project will earn good 'prawn-dollars' in the export market. So, a nod was given by the government to implement the policy at the cost of the environment of the lake. And the government officials'

interview during the fieldwork refer to earning foreign exchange resources as the main cause of implementing the Tata Project.

The decision for allowing the Tatas to have a joint venture with the Government of Orissa in the form of Chilika Aquatic Farms Ltd. was undertaken by the former Congress (I) government. This led to a resistance, supported by the then opposition political party - the Janata Dal. The Janata Dal leader Biju Patnaik had claimed to have taken an oath, with a handful of the water of Chilika, that he would rescue the region from the clutches of the Tatas. The resistance gave the Janata Dal all the five assembly seats in the region which was earlier won by the Congress I. However, in 1989, with the Janata Dal coming to power, the situation once again took a change. In 1991, the Orissa government in a total about turn from the earlier position adopted by the Janata Dal, invited the Tatas to form a joint sector company for prawn culture in the Chilika. And now the Congress-I, who had lost the seats in Chilika region is trying to regain those seats by opposing the implementation of the Tata Project. An interview with the Congress-I leader J.B. Patnaik who had taken the decision of allowing the Tatas reveals the impact of the projects on the political process even though their opposition, as mentioned by him, is based on technical ground.

The growing unrest in this region can never be categorised into a form of class conflict for bringing out social change, rather it can be analysed as a form of clash of interest leading to conflict and social unrest. The clash of interest has led to the rise of the phenomenon of 'mafia-raj'. During an informal talk with the people and the interview of the 'Save Chilika Movement' leaders, everybody admit the existence of mafia and their role in growing unrest in the region. While admitting the existence of mafias, they blame the government policy for the rise of mafias while the government officials say that the implementation of the Tata project will quell the mafias. This system of 'mafia-raj' actually started in the early '80s and reached its climax in 1988, when the government changed its lease policy from an annual lease to three years lease of Chilika fishery sources. They have no consideration for the environmental, ecological and natural balance of the lake and instead, they create frequent law and order problems in the lake areas. Hence, strong administrative measure and people's consciousness is needed to solve the problem of 'mafia-raj'.

Thus, it can be said that the environment and development debate can be seen as a debate about the meaning of development. Just as the growth of socialism questioned development without equity, growing environmentalism is questioning development without

sustainability. And just as acceptance to equity changed the meaning of development; so also must the acceptance of sustainability. Hence, the major challenge that the society faces is to devise a new strategy of sustainable development i.e. a development process that while improving the material welfare of all the people at the same time protect and preserve the natural and human resource base. At the institutional level, it seems, such a sustainable development strategy will involve developing and linking grass-root organisations with that of market institution and state machinery. This is necessary so that the local community can have control over the decisions that affect their economic, social and natural environment; the market can have control over the market forces and in turn help in the process of development and the state can play the role of promoter, facilitator and coordinator of all the development projects. And this participatory development is particularly essential in the context of adding a dimension of ecological sustainability to all development projects.

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APPENDIX - I

Geographical location : Latitude (N) Longitude, (E)	19° 30' to 19° 54' 85°6' to 85° 35'
Water spread area (km ²) Summer Monsoon Average	906 1,165 1,055
Rivers and nallahs draining into Chilka	10
Chilka catchment excluding Mahanadi drainage/ha	321, 189
Water Depth (m) : - Average in summer average in monsoon	0.94-2.63 1.78-3.7
Silt brought to Chilka by rivers (MT/year)	13
Length of outer channel connecting lake with the ocean (km) Lake mouth (bar mouth) opposite Arakakuda Village	35 one
Average salinity (ppt)	2.8-29.8
Primary production (mgc/m ³ /hour)	6.08-68.80
Macrophyte infested area (km ²)	200
Ave. macrophyte expansion rate (Sq km/year)	15
Fish species : Marine species Brackish water Fresh water species	158 15 119
Bird species Migratory waterfowl species	151 92
Number of fishing villages	122
Number of fishermen (total)	60,000
Number of active fishermen	15,000
Number of boats(non-mechanized)	21,065
Number of nets	4,400
Annual fish catch in 1985, (tonnes)	6,208
Percentage of catch from each method a) Bahan (net fishing) b) Janos (enclosure by bamboo) c) Traps (prawn fishing)	60% 15% 25%

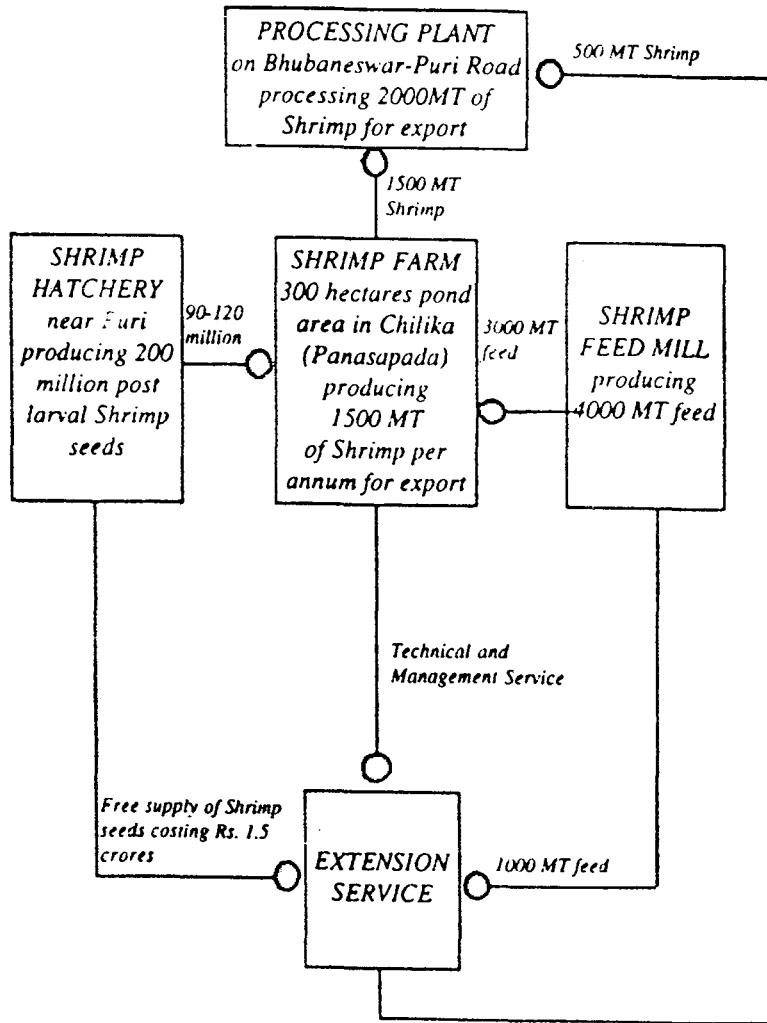
Source : 1. Chilka Lake Project Report feasibility Report CIDA 1992
2. WAPCOS Chilka Aquatic Farm Ltd. Interim Report, 1992

APPENDIX - II

Project area	400 ha
Pond area (50 ha x 6)	300 ha
A 30 m wide cut through the farm site	Connecting the lake and Bhubania river
Hatchery capacity	200 million (PL-20)/year
Shrimp seed (PL-20) for farm	90-120 million/year
Shrimp seed (PL-20) for sale, etc.	70-110 million/year
Water requirement/day	6,300 litres
Water requirement/year	65 Mm ³
No. of wells	48
No. of pumps of 10 HP each	144
No. of aerators (120/pond)	720
Generators (75 KVA each)	4
Diesel consumption/day	6,912 litres
Feed consumption/year	3,000 tonnes
Grow out period (crop duration)	150 days
No. of crops/year	2
Production (10 ³ kg)	1,500 MT
Effluent discharge/daily (10%)	6,300 litres
Effluent discharge/year (Approx. 90%)	3.6 Mm ³
Seining yearly (10%)	0.45 Mm ³
Sediment pond (3,000 m x 500 m)	one
Sluish management	Quantity and mode of disposal not specified
Shrimp processing unit	One
Shrimp feed mill	Proposed
Shrimp farm personnel -CAF Project: (regular & contractual) - WAPCOS	360 (39+320) 700 (120+580)
Building (40 units) area	1,640 m ²
Capital expenditure	Rs. 1,158 lakh
Income	Rs. 3,000 lakh

CHILIKA AQUATIC FARMS LIMITED

Flow chart of the various units



SOURCE : TAF 1992, INTEGRATED SHRIMP FARM : PROJECT PROFILE