
UNIT 15 ECO-FRIENDLINESS OF PROJECTS

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15.1 INTRODUCTION

Our country is at crossroads of transition from an agrarian to an industrial economy. The dilemma is how to achieve the fruits of industrialisation without sacrificing nature's beauty. The importance of protecting the environment has never been greater than now. A clear environment and economic well being are mutually compatible. Eco-Friendly projects and sustainable development requires new approaches in the use of technology and is much more than mere growth. Uncontrolled growth is, in fact, a form of cancer.

As far as eco-friendliness of projects is concerned, there will be a continuous tussle between Environment and Industry. In many cases the eco-friendliness of a project is not examined properly, this is when people's movement start building momentum to save the local area under consideration.

Objectives

After studying this unit, you should be able to

- explain sustainable development, eco-friendliness, ITEGIS software package, Eco-mark, and non-conventional projects,
- describe project screening criteria,
- appreciate risk management in project,
- discuss Environmental Impact Analysis (EIA) and its components,
- describe the assessment criteria for Eco-mark, and
- explain role of financial institutions.

15.2 CONCEPT OF SUSTAINABLE DEVELOPMENT

In the words of the well known World Commission on Environment and Development "Sustainable Development is Development that meets the needs of the present without compromising the ability of future generation to meet their own needs".

In simple terms, a sustainable society and sustainable development mean that our generation has to make a conscious decision to control the use of natural resources whilst

meeting our needs. Developmental project must be able to put back into the nature for what they take from it, to sustain earth.

There has been a broadening of project assessment techniques over the past 20 years. To begin with there was no formal accounting and decisions were made largely on the basis of Interest Group Lobbying. Then came the introduction of Cost-Benefit Analysis, first as a fairly crude efficiency maximising device with an emphasis on monetary quantification but later as a more wide ranging accounting technique operating in relation to a number of objectives multiple discount rates and imaginative Proxy Pricing methods. The multiple-objective aspect of cost benefit was further developed by the introduction of Programme Budgeting and Programme Analysis Review. These innovations were still not sufficient to cope with the demands of the new environmentalism which emerged in the 1970s. As a response first environmental impact assessment of projects appeared based largely on description of effects on Bio-physical processes.

15.3 RISK MANAGEMENT AND PROJECTS

Risk Management is the process by which the likelihood of risk occurrence or its impact on the project is reduced. It has five steps.

- Identify the potential sources of risk on the project.
- Determine their individual impact and select those with a significant impact for further analysis.
- Assess the overall impact of the significant risks.
- Determine how the likelihood or impact of the risk can be reduced.
- Develop and implement a plan for controlling the risks and achieving the reductions.

If a project is Eco-friendly external unpredictable risk is reduced drastically. These external unpredictable risks are beyond the control of manager or their organisations. Government or regulatory intervention can relate to the supply of raw materials or finished goods.

Many projects have been killed by the unexpected requirement to hold a public enquiry into the environmental impact.

15.3.1 Strategies for the Project's Context

The strategies for handling the project's context must include

- External Influences
- Financing the Project
- Scheduling the Project

An analysis of causes of project overruns shows that external factors are a principal cause. Several may be identified but the project's political context, its relationship with the local community, the general environment and the projects location and the geophysical conditions in which it is set are particularly important.

The stake holders especially the local community are an important external influence. The management of change must take account of this influence and so techniques such as Environmental Impact Analysis (EIA) procedure have now been adopted.

This process shows how substantive dialogue can help reduce potential opposition. The value of the EIA process is that it allows consultation and dialogue between developers, the community regulators and others, and yet forces time to be spent on the front end in examining option and ensuring that the project appears viable.

Thus, the likelihood of community opposition and of unforeseen external shocks arising is diminished. Furthermore, in forcing project developers to spend the time planning, the EIA process emphasises prices that project stage which traditionally was rushed, in spite of the obvious dangers. What factors lead upto the introduction of EIA (Environmental Impact Assessment) as one of the assessment techniques in Project Management ?

The prime factor was the scale and apparent urgency of implementation of major Resource Development Schemes in Water Management, Energy Supply, Transportation, Mineral extraction and agricultural improvement. Many of these schemes were so

massive and were promoted so rapidly that all kinds of damaging side-effects both to the physical environment and to local communities became too obvious to ignore. Examples included the whole scale removal of settlements for large dams and motorways, the disfigurement of scenically attractive areas for coal developments and water supply reservoirs etc. All this led to the necessity of EIA.

15.4 ECO-FRIENDLY PROJECTS AND ENVIRONMENTAL IMPACT ASSESSMENT

Environmental awareness is increasing everyday. The two major criteria, i.e. (a) the project should maximise economic return, (b) should be technically feasible, are no longer considered adequate to decide the desirability or even the viability of the project.

In many cases it has been seen that undesirable consequences of the projects may nullify the socio-economic benefits for which the project was designed.

Environment Impact Assessment is one way by which the ecological effects of the projects are weighed. The objective of Environmental Impact Assessment is to achieve sustainable development with

- (a) Minimal Environmental Degradation
- (b) Prevention of long term environment adverse effects by incorporating suitable mitigating measures.

Environmental Impact Assessment process therefore, involves evaluation of Environmental implications and incorporation of necessary safeguards for those activities having a bearing on Environmental quality. Evaluation of the beneficial and adverse effects of development projects on the eco-system is attempted both qualitatively as well as quantitatively.

The high speed of Industrial development and commercialisation which has permitted material standards of living to reach high levels has also led to unforeseen effects on the very environmental assets that constitute the basis for sustained socio-economic development. It is becoming clear that air, water and soil must, of necessity be treated as precious natural resources requiring careful management. Simple cures for pollution problems are no longer sufficient. Comprehensive policies for preventive action to avert environmental damage before it occurs are becoming imperative. In this context the wide application of environment impact assessment has become a promising instrument to prepare public decision making on Developmental action.

To be really meaningful, impact assessment was to be taken up at the project inception stage itself, so that

- selection of site,
- choice of process technology,
- selection of appropriate layout, and
- building materials

can be done to ensure environmental compatibility.

15.4.1 Social Component

This remains sadly neglected and often adversely affects the poorer sections of the society whenever rehabilitation is involved, also needs to be incorporated to ensure that quality of life for the affected people do not deteriorate but should improve. This is specially so when the affected population happens to be predominantly tribals or *adivasis*.

15.4.2 Basic Contents of an Impact Statement

There are five points that need to be adhered to in an Impact Statement. They are :

- (1) Project description,
- (2) Land use relationships,
- (3) Probable impact of the proposed action on the environment,
- (4) Alternatives to the proposed action, and
- (5) Probable adverse environmental effects which cannot be avoided.

Now, let us see each of the points in detail.

Project Description

Both the negative and positive impacts of the project should be examined/explored in complete detail. In addition, attention must also be directed towards the primary and secondary impacts associated with a proposed action. Primary and secondary impacts are also referred to as direct and indirect consequences. In general, agencies have developed methods and procedure to respond in part to direct impacts both beneficial and adverse.

The major impact of a project in many cases is due to the secondary or tertiary effects and these are quite difficult to assess due to dearth of predictive techniques available. In this stage, the following aspects have to be looked into :

Purpose of the Project

Here one has to see whether the project has been set up to increase employment opportunities or to make some essential commodity available e.g. power etc.

Description of Action

Some aspects that has to be looked into are :

- estimated expenditure
- existing and modified land-use

Site improvement: side walls, street lighting, water sewer, storm drainage, landscaping and parking.

- Construction Method
- Project timing schedule

Environmental Setting

- (i) Project location
- (ii) Environment prior to proposed action :
 - (a) Physical character of the area,
 - (b) Social and economic characteristics of the area, and
 - (c) Aesthetical description of area e.g. scenic views.

Land Use Relationships

Description relating to the proposed action to land-use plans, policies and controls for the affected area.

- (a) Federal and State or local policies or standards which are in danger of being violated or ignored.
- (b) Relationship to local/area-wide/state planning.

Probable Impact of the Proposed Action on the Environment

Here, both the impact of the proposed project on the environment and the impact of the environment on the project should be covered. The following is a set of sample question that should be asked for a proposed land development:

- Is the development controversial ?
- Will the development substantially alter the patterns of behaviour for mammals, birds, fishes etc. ?
- Will the development adversely affect the water table or cause water pollution?
- Will it cause air pollution ?
- Will it affect the soils and or geology of the site ?
- Are the geological or soil conditions of the site hazardous to continued on-site or off-site human occupancy ?

Cultural Questions

- Will the Project affect areas of unique interest or beauty (including archaeological/anthropological interest) ?
- Will the project give rise to abnormal amount of traffic ?

Both primary and secondary significant consequences to the Environment should be included in the analysis.

Primary Effects

Include direct impacts on man's health and welfare and on other forms of life and related ecosystems. Example of direct effect might include noise from construction activity.

Secondary Effects

This includes an indirect environmental impact particularly on population concentration and growth, e.g. people are attracted to previously unpopulated areas and indirectly cause pollution, congestion and land development.

Alternatives to Proposed Action

Any alternative technology which is practicable and more environmentally friendly should be included. It is important here to include all viable alternatives, the purpose is to find more environmentally acceptable solutions to problems here so that they may be implemented by whatever means may be necessary.

Analysis of Alternatives

Sufficient Analysis of such alternatives, their costs and impact on the Environment should accompany the proposed action through the agency review process in order not to prematurely foreclose options that might have less detrimental effects. Compare and evaluate the costs and benefits of these alternatives with those of the proposed project and discuss why they were rejected.

Probable Adverse Environmental Effects which cannot be avoided

Here the seriousness of the adverse impact resulting from the recommended action should be discussed. Describe why the action is being proposed in spite of adverse impacts (countervailing interests) and show how environmental aspects have been balanced against technical and financial considerations of the projects anticipated accomplishments.

What has been done to minimise adverse impacts must also be described. The EIA system, thus, is a potentially useful component of good environmental management. However, as currently practiced, it is far from perfect.

The future of Environmental Impact Assessment will be characterised by manifold activities. More federal guidelines and the passage of additional state and local Environmental Policy Acts will result in the preparation of more Environmental Impact Statements.

Although more environmental statements will be prepared, their length will be reduced in future due to developments in technology for impact prediction and assessment and methodologies for evaluation of alternatives.

Public participation in all aspects of environmental decision making will increasingly occur in future. Finally, current and future research efforts will provide information relevant to many of today's unanswered questions.

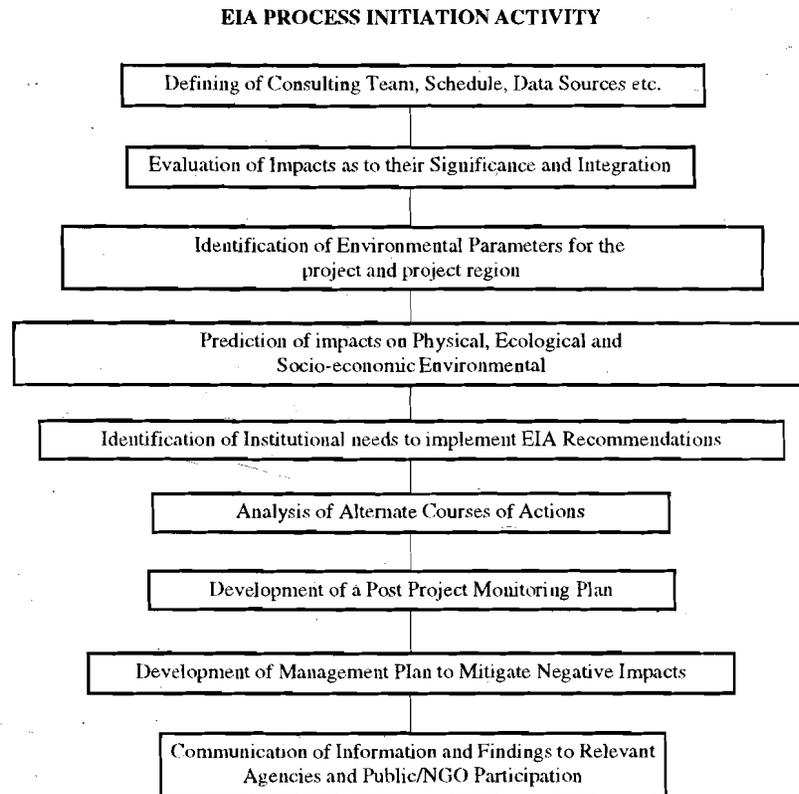
SAQ 1

- (a) Define sustainable development. Trace the origin of Environmental Impact Assessment (EIA) from Cost Benefit Analysis.
- (b) Discuss about the five steps of risk management in projects.
- (c) What are the main strategies for handling a project's context?
- (d) What factors led to the Introduction of EIA as assessment technique?
- (e) What is the main objective of Environmental Impact Assessment (EIA)?
- (f) Discuss about the importance of social component in any project.
- (g) What are the basic contents of an impact statement?
- (h) Justify the importance of land-use relationships and project description in an environment impact study.
- (i) What are the sample questions one should ask about the probable impact of the proposed action on the Environment?

- (j) State the importance of writing down and weighting alternatives to the proposed action in EIA.

15.4.3 Flow Chart of Activities in EIA Process

Following is the flow chart of activities in EIA process :



15.4.4 Reviewing Environmental Impact Statements

A review procedure can be used both by the reviewer and the preparer of an EIS document for ascertaining completeness accuracy and validity of the document.

Twelve project screening questions are usually used to categorise potential impacts according to project characteristics. The questions are generally designed to cover a broad range of major environmental impacts associated with any project. These questions are answered either by "Yes" or "No" or by "High", "Medium" or "Low".

Project Screening Criteria

Each response, rating from table for each screening question was developed by use of informed professional judgement.

Each response rating is assigned a score 10, 5, 0. For each yes, a project gets a score of 10 for each No, the score is 0. For high, medium and low ratings, scores assigned are 10, 5 and 0 respectively.

		Scores
(a)	Level I : Small Impact Project	Below 60
(b)	Level II : Medium Impact Project	Between 60 to 100
(c)	Level III : High Impact Project	Above 100

These levels can be used to discriminate projects that require detailed versus less detailed review. High Impact Project should be given the most thorough review.

Table 15.1 : Screening Questions (e.g. Construction Project)

Sl. No.	Questions	Rating	Score
1.	What is the approximate cost of the Construction Project ?	High Medium Low	10 5 0
2.	How large is the area affected by the Construction Project ?	High Medium Low	10 5 0
3.	Will there be a large, Industrial type of project under construction ?	Yes No	10 0
4.	Will there be a large, water related Construction Activity ?	Yes No	10 0
5.	Will there be a significant waste discharge to the natural waters (in terms of quantity and quality) ?	Yes No	10 0
6.	Will there be a significant disposal of solid waste (quantity and composition) on land as a result of construction and operation of the project ?	Yes No	10 0
7.	Will there be significant emissions (quantity and quality) to the air as a result of construction and operation of the project ?	Yes No	10 0
8.	How large is the affected population ?	High Medium Low	10 5 0
9.	Will the project affect any unique Resources (Geological/historical archaeological, cultural/ecological) ?	Yes No	10 0
10.	Will the construction be on floodplains ?	Yes No	10 0
11.	Will the construction and operation be incompatible with adjoining land use in terms of aesthetics/noise/odor/general acceptance ?	Yes No	10 0
12.	Can the existing Community Infrastructure handle the new demands placed upon it during construction and operation of the project (Roads/Utilities/Health Services/Vocational Education/Other Services) ?	Yes No	10 0
Source : R. K. Jain, L. V. Urban, G. S. Stacey, "Environmental Impact Analysis", Van Nostrand Reinhold, New York.			

Review criteria are employed to assess the accuracy of the impact statement.

15.5 COMPLEXITY OF ECO-FRIENDLY PROJECTS

Environmental Issues in Conventional and Non-conventional Irrigation Projects

Conventional projects are those which use water from river, lake, streams, ponds, reservoir, surface and groundwater bodies. In non-conventional category comes irrigation projects which use water from sea, water harvested through rain catchment, municipal and domestic sewage water, industrial water effluent, effluent from hotel industry etc.

Conventional and non-conventional Irrigation projects produce different environmental issues, where the latter demands more closer examination and appraisal from the viewpoint of financial Institutions. Alam and Srivastava (1986), Srivastava and Daisley (1983) and Srivastava and Brudi (1981) have shown that the requirements of technological packets and project appraisal for conventional and non-conventional

irrigation projects are different. Financial Institutions financing these projects also take environmental matters into consideration.

There are different methodologies used because in case of conventional irrigation project the environmental issues are seen through hydraulics and hydrology of water while for non-conventional irrigation projects environmental issues are analysed through additional factors such as material (organic and inorganic matters) transport, decay and transformation.

Here, let's look into "The Environmental Issues in Non-conventional Irrigation Project". Rapid industrialisation and urbanisation created a large gap between supply and demand of conventional water for irrigation. The gap is pronounced and wider in Arid and Semi Arid Land (ASAL) than in humid area. As demand from priority sectors (municipal and industry) is approaching production limit of conventional water, the agriculture in future may have to largely depend on non-conventional irrigation.

Juwarkar (1988) estimates 2.5 lakhs hectare can be irrigated by urban wastewater, indirectly, including treated industrial effluent and domestic wastewater. It can be speculated that about 69 lakhs hectare can be irrigated in this way, i.e. about 12% of total irrigated area in India.

As environmental awareness grows and Industries become responsible for treating their effluent more and more can be brought under non-conventional irrigation. Studies on availability of treated industrial effluent for irrigation are scanty, but study on domestic wastewater is available. Wastewater generated is estimated to be of the order of about 10,000 million litres per day from about 110 urban centres in 240 towns and cities having population of more than 50,000 (NEERI, 1985).

The non-conventional irrigation has demand from viewpoint of economic necessity but it also has additional issues to what is given above, namely

- hazard to health,
- toxicity to soil,
- toxic residue in the product, and
- contamination of surface and ground water.

Domestic effluent is comparatively harmless if synthetic detergents are not very high in concentration but industrial effluents are dangerous in terms of chemical composition.

It is pollution loading rate to soil which is of concern in non-conventional irrigation. The pollution loading rates depend on factors such as chemical and physical properties of effluent, terrain feature of the land, chemical, physical and micro-biological properties of the soil, land-use, crop and irrigation plant, etc. Shallow and deep groundwater contamination is a main concern which refrains institutions from considering non-conventional irrigation project as an environmentally friendly venture. Thus conventional irrigation requires a different technological and on-farm management packages than the conventional irrigation to counteract the negative environmental impacts mentioned above. This is a typical example to show the controversial problems involved in eco-friendly projects.

15.6 FINANCIAL INSTITUTIONS AND PROJECT'S ECO-FRIENDLINESS

From the perspective of financial institutions, Environmental Impact Assessment (EIA) is inherently linked to the project cycle. EIA begins with screening at the time of project identification. Getting EIA done is the responsibility of whoever is taking credit loan (borrower) and incorporating it into project appraisal is the task financial institution. Prior to project appraisal, EIA study is sent to Financial Institutions. Thus, EIA is a prerequisite for Bank loans and credit except sectoral and structural adjustment loans for the project. If the EIA study is satisfactory it forms the basis for making decision to clear the project and incorporate Environment Management Plan (EMP) into the loan agreement. After the agreement is signed it becomes mutual responsibility of the financial institutions and borrower to monitor environmental performance and compilation according to EMP conditions spelled in the agreement. After implementation is complete the project completion report should include evaluation of impact that occurred and the effectiveness of mitigation measures adopted in Environmental Management Plan.

Figure 15.1 shows application flow diagram of a model ITEGIS software (Srivastava and Kumar, 1993) in internal and external management and appraisal, monitoring and evaluation of agricultural and industrial projects. ITEGIS is an acronym for Integrated Terrain Environmental and Geographic Information System. The ITEGIS produces appraisal report after integrating EIA and EMP into financial institutions policy on loan & credit. The ITEGIS works on a personal computer and is user friendly.

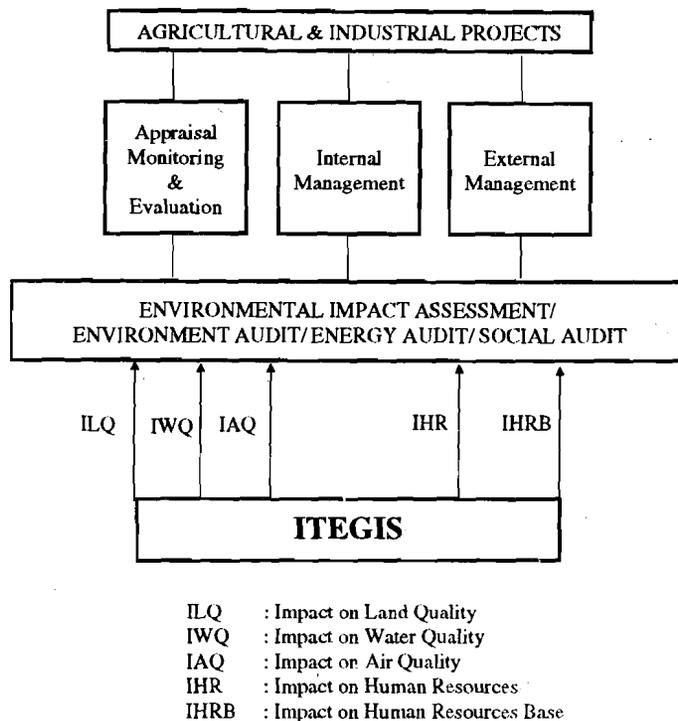


Figure 15.1 : Application Flow Diagram of ITEGIS in Agricultural and Industrial Projects

Training in Financial Institution become inevitable to use ITEGIS either on computer or using tabular and hand calculation of EIA and EMP procedures.

ITEGIS produces impact of a project on land, water, air quality, human resources and human resources base. All these impacts are then analyzed to produce EIA, Environment Energy and Social Audit of the Project. EIA and all the audit reports are then used to produce project appraisal report according to environmental policy of Financial Institutions. Thus depending on the size and complexity of the project one can either comprehensively use ITEGIS simulation result or use a simplified project-wise guidelines derived from the simulation models. Computer models help in doing calculations in perspective financial planning and prediction of resource production and productivity with the time and space.

SAQ 2

- Give a flow chart of activities in EIA process.
- Discuss briefly about reviewing environmental impact assessment.
- Give some sample project screening questions to be used while reviewing EIA.
- Discuss about environmental issues in conventional and non-conventional irrigation projects.
- Write briefly about ITEGIS model software used in evaluation of agricultural and industrial projects.
- Justify the importance of computer models in EIA.

15.7 ECO MARK

Different countries have adopted different measures to promote schemes for environmental protection. One such scheme is the labelling system of products to indicate environment friendliness of products. In India, a scheme of eco-mark has been introduced which aims at distinguishing any product which is made used or disposed off in a way that significantly reduces the adverse effect it would otherwise have on the environment.

The objectives of the scheme are as follows :

- to provide an incentive for the organisation to produce environment friendly products.
- to reward genuine initiative by organisations undertaking to minimise the adverse impact of their operations on the environment.
- to help customers to become environmentally responsible by extending their patronage to products which are environmentally benign.
- ultimately to improve quality of the environment and to encourage the sustainable management of resources.

Assessment Criteria

Assessment criteria is such that only eco-friendly projects can produce Eco-mark products.

A perfectly environmentally sound product does not exist. There will also frequently be controversy about whether a particular feature is really unharmed to the environment or not. However, the assessment will encompass all aspects of a product from production through packaging and use to disposal. The different criteria for this is as follows and all this have to be kept in mind at the project inception stage itself.

Criteria are as follows :

- Productions process, including source of raw materials
- Wise use of natural resources
- Likely impact on the environment
- Energy conservation in product
- Effect & extent of waste arising from the production process
- Utilization of waste and recycled materials
- Suitability for recycling or packaging
- Disposal of the product and its container
- Biodegradability

15.8 QUESTIONING DEVELOPMENTAL PROJECTS

Environmental awareness in public have increased over the past few years. Local communities have started asking uncomfortable questions about developmental projects.

In many cases, people find that their land is being requisitioned for a project from which they will derive no benefit. The decade long battle against Sardar Sarovar Project on the Narmada river is an example of this.

A system of consultation must be devised so that the views of the community who will be affected as a result of the project is taken into consideration.

Example of projects which failed due to lack of eco-friendliness are as follows :

Goa

People in Goa are very concerned about their fragile Eco-System. "Economic Development should be compatible with Environmental Protection". This aspect has come to occupy centre stage in Goa now.

The Nyton project was mooted in 1983 by the Economic Development Corporation (EDC), a State Government Undertaking, but the letter of intent was subsequently

transferred to a new company, Thapar Dupont Limited (TDL). The project involved setting up of 18,500 tonnes/Annum nylon cord plant with an investment of over Rs. 800 crores. Everything about this project has been questionable, starting from the decision to start a chemical industry in Goa in total disregard of the stipulation to keep the state free from polluting industries. The State Government then also helped TDL by clearing the project overruling objections and without bothering to check the likely impact on the Environment.

The project suffered a major setback in 1990, following allegations that rules had been flouted to hand over land belonging to the agricultural societies, to DuPont.

The progressive democratic front-ruled Government of that time appointed a House Committee headed by Mr. A. N. Naik, to go into the Environmental Implications of the Project including its socio-economic impact and also look into allied matters like the events leading to the proposal to establish the Nylon 6.6 project in its present location, the role of Government Authorities and the intentions of the project promoters.

After a detailed study, the committee recommended that the project should be shelved on account of the likely threat of pollution. It called for the cancellation of the "letter of Intent". The committee stated that it would be an ill-advised move to allow large chemical industries, discharging even their 'treated' effluents in Goa's eco-rich and virgin Rivers. The committee stated while deciding on the establishment of large chemical industries in a small relatively densely populated and socio-economically rich state like Goa, one has to consider not only the statistical probability of a possible industrial accident but also the disastrous danger to human and ecology that may result from such an accident. In a tiny state like Goa, any large Capital Intensive Industry is bound to consume a significant percentage of available natural resources, but in turn contributes negligibly to the local economy.

Among the lapses noticed was the failure to get an Environmental Impact Assessment for the project which is mandatory before an clearance is given. Environmentalists were opposed to the project mainly because of the unsuitability of the area, the deleterious impact, the tapping of water would have on the water table and the unsatisfactory pollution control measures taken by TDL.

On January 23, 1995, some foreign delegates were expected to visit the factory site. People gathered near the factory site and prevented vehicles carrying the delegates and others from reaching the site. The police tried to disperse the crowd and in the process, one of the agitators fell victim to police firing. After this, the mob went literally berserk and ransacked the TDL offices. Some police vehicles were set on fire and three policemen were "forcefully" detained by the agitators for some time. A bandh was observed against the police in Ponda town the next day.

There is nothing at the TDL site now, the TDL officials staying in Ponda & Panaji have quit the place. Anti-Nylon Citizens Action Committee (ANCAC) and the ECO-Forum, an umbrella organisations of the Environmental groups in Goa are determined to ensure that TDL does not revive its operations in Goa. With this project, the Government realised that the people of the area do not want the project due to its lack of eco-friendliness.

SAQ 3

- (a) Give an example to illustrate that people of the area can stall a project if it is not eco-friendly ?
- (b) What does ANCAC stand for ?
- (c) What are the ecological issues involved in the nylon project ?
- (d) What is the importance of Eco-mark ?

15.9 CASE STUDY : NARMADA DAM

Sardar Sarovar Project is typical case of a project which is in troubled waters due to lack of Eco-friendliness. Two official reports of the Jayant Patil Committee and the Dam Safety Panel which have strongly criticised several aspects of the Sardar Sarovar Project have come as a shot in the arm for the Narmada Bachao Andolan.

The Dam safety panel confirmed the news that the stilling basins at the base of the dam were seriously damaged in September 1994.

One of the major problem of this project is that the people displaced were not rehabilitated properly. A report by a six member all party team of Madhya Pradesh MLAs which was placed on the floor of the state assembly on December 14th, stated that the rehabilitation sites were waterlogged amenity-less, barren waste fallow land. The report also pointed out that even though the rehabilitation master plan for the oustees in Madhya Pradesh was supposed to have been completed by 1981, as required by the Narmada Waters Dispute Tribunal (NWDT) award, even till 1995 such a plan had not been finalised.

The Patil Committee report also draws attention to several groups of people who will be affected in the project but who have not been listed as "Project Affected Persons (PAP)". These includes those to be displaced by the canal network, the downstream displacement, those affected by the backwater effect, those who will have to move to make way for compensatory afforestation and catchment area treatment and finally those who will be affected when forest land, for instance is released for the displaced. Among its recommendations, the committee suggested that each state should appoint an ombudsman, who can address the grievances of PAPs and non-governmental organisations working with them. This case study is thus an example to show that unless systematic effort to deal with environmental issues at the inception stage itself, there will surely be problems in the future.

Projects Requiring Environmental Clearance from the Central Government

Under the Environmental Protection Act (EPA) 1986, in 1994 expansion or modernisation of any activity if pollution load is to exceed the existing one, of new project listed in schedule I, shall not be undertaken in any part of India unless it has been accorded environmental clearance by the central government in accordance with the procedure stipulated.

The list of projects requiring environmental clearance are as follows :

- (1) Nuclear Power & related projects such as Heavy Water Plants, Nuclear fuel complex rare earths
- (2) River valley projects including Hydel power, Major irrigation and their combination including flood control
- (3) Ports/Harbour, Airports (except minor ports & Harbours)
- (4) Petroleum Refineries including crude & product pipelines
- (5) Chemical fertilizers (nitrogenous and phosphatic) other than single superphosphate.
- (6) Pesticides (Technical)
- (7) Petrochemical complexes
- (8) Bulk drugs and pharmaceuticals
- (9) Exploration for oil and gas and their production, transportation and storage
- (10) Synthetic Rubber
- (11) Asbestos and Asbestos Products
- (12) Hydrocyanic acid and its derivatives
- (13) (a) Primary metallurgical Industries (such as Production of iron and steel, aluminum, copper, zinc, lead and ferrous alloys)
(b) Electrical Arc furnaces
- (14) Chlor alkaline Industry
- (15) Viscose staple fibre and filament yarn

- (16) Integrated Paint complex including manufacture of Resins and basic raw materials required in manufacture of paints
- (17) Storage batteries integrated with manufacture of oxide of lead and lead antimony, alloy
- (18) All tourism projects between 200-500 metres of high water tide.
- (19) Thermal Power Plants
- (20) Mining Projects
- (21) Highway projects
- (22) Tared Road in Himalayas and or forest areas
- (23) Distilleries
- (24) Raw skins and Hides
- (25) Pulp, Paper & Newsprint
- (26) Dyes
- (27) Cement
- (28) Foundries
- (29) Electroplating

In the face of unending controversies and the resultant delays in the implementation of large development projects, the central government has in the later part of the year 1991, set up a "standing committee on environmental clearance for developmental projects" headed by the Dy. Chairman of the Planning Commission. It aims at clearing any projects within three months.

This major initiative taken personally by the countries Prime Minister will reduce own project overruns to some extent.

SAQ 4

- (a) Discuss about the controversies in Sardar Sarovar Project and findings of Patel Committee.
- (b) Which are the projects requiring Environmental Clearance from Central Government ?

15.10 SUMMARY

As major projects will be finally cleared and financial sanctions given only after the environmental impact is examined properly, it is better to prepare a good environmental management plan in the beginning itself for all phases of the project. To make projects true eco-friendly environmental protection aspects have to be incorporated in the project design, construction methods and operation and maintenance systems employing sophisticated technology and rigid monitoring system.

15.11 ANSWERS TO SAQs

Refer the relevant preceding text in the unit or other useful books on the topic listed in the section "Further Reading" to get the answers of the SAQs.

FURTHER READING

J. Rodney Twinor, *The Handbook of Project Based Management*, McGraw Hill, 1993.
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