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* ENVIRONMENTAL IMPACT ASSESSMENT:-

In order to assess the adverse possible effects of a proposed developmental project on the environment surrounding the proposed project. A detailed analysis is required to be made. This report is known as the environmental impact assessment (EIA).

As a matter of fact, the impact assessment attempts to determine the effects of the installation of a development project on the existing relationship betⁿ the surrounding & its inhabitants.

- i) The practice for preparing an environmental impact assessment for a project was ~~assessment~~ initiated on Jan 1, 1970 in the USA.
- ii) Since then more than 100 developing & ~~develop~~ nations have either passed specific laws or have adopted procedures, used as were.
- iii) As far as India is concerned the ministry of environment & forest (MoEF) GOI, for the 1st time it should environmental guide lines for setting of specific time of industries in Aug 1985, relating to areas to be avoided for setting of industries & measures to be taken for site selectⁿ, as also the various aspects of environmental protectⁿ which should

be incorporated during the implementation of the proposed industries developing project.

iv) On 27th Jan 1994, to MoEF, GOI, it should be the 1st important notification governing the need of submission of environmental impact assessment with environmental plan (EMP) for specified types of developmental projects, to the MoEF for obtaining its clearance, before the project can be got sanctioned for execution.

→ The 1st notification of 27th Jan 1994 has been superseded by a recent notification of 14th Sep 2006.

This 2nd notification, however provides that all the applications submitted till 14-09-2006 under the provisions of the 1994 notification, shall be decided on the basis of the same notification.

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* Indian's Environmental impact assessment notification, 1994 :-

The original notification dated 27th Jan 1994 included 27 types of or industries which were brought under the ambit of this notification but with the passage of time, 5 more categories were added. Thus by bringing 32 types of projects within the ambit of this act.

Out of this 32 types of projects, 15 types of projects or industries by necessarily required

to obtain environmental clearance irrespective of the cost of project. one type of project needed environment clearance, if the project cost exceeded 5 crores, while 16 types of project needed environmental clearance when the project cost exceeded rupees 50 crores, as detailed below in categories, (A), (B) & (C) respect...

* Least of projects requiring environmental clearance irrespective under EIA notifiⁿ 1994:-

{A} Least of projects required environmental clearance irrespective of cost of project.

- 1) Pesticide (technical)
- 2) Petrochemical complexes, petrochemical intermediates, such as, DND, caprolactam, LAB etc.
- 3) EN-productⁿ of basic plastic, such as LDPE, HDPE, PP, PVC.
- 4) Bulk drugs & pharmaceuticals.
- 5) Asbestos & asbestos product.
- 6) Hydrocyanic acid & its derivatives.
- 7) Chloro alkali industries.
- 8) Integrated paint complex including manufacture of resins & basic raw materials required in the manufacture process of paints.
- 9) mining projects with leach more than 5 hectares.

- 9) Taxed roads in himalayan & forest areas.
- 10) Distillaries.
- 11) Raw skins & hides.
- 12) Dyes.
- 13) foundaries.
- 14) Electro plating.
- 15) meta animo phenol.

{B} Least of projects needing environmental clearance when project cost exceed 5000000.

- 1) All tourism projects betⁿ 200 to 500 m of high water tide line or at locatⁿ with an elevatⁿ of more than 100 m

{C} Least of project needing environmental clearance when project cost exceeds 5000000.

- 1) Nuclear power & related projects such as, heavy water plants, nuclear fuel complex, rare earth.
- 2) River value project including hyden power, major irrigatⁿ & their combinatⁿ including flood control.
- 3) ports, harbours, airports (except minor ports & harbours)
- 4) petroleum refineries including crude & product pipe lines.
- 5) Chemical fertilizers.
- 6) Explosatⁿ for oil & gas & their product, transportⁿ & storage.

- 7) Synthetic rubber.
- 8) → primary metallurgical industry.
→ Electric arc furnace.
- 9) viscose staple fibre & filament yarn.
- 10) storage batteries integrated with manufacture of oxide of lead & lead antimonite alloy.
- 11) Thermal power plants.
- 12) Higher projects except projects relating to improvement work.
- 13) Pulp, paper & news print.
- 14) cement.
- 15) New constructⁿ projects.
- 16) New Industrial estates.

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* India's EIA notifiⁿ, 2006 :-

Under this new notifiⁿ dated 15-09-2006, all projects or activities which need environmental clearance from the regulatory authorities having decided into 2 types.

- i) category A.
- ii) category B.

Projects or activities falling in category A needs environmental clearance from the central govt. on the recommendⁿ of the Expert appraisal committee (EAC). preparatⁿ of EIA is necessary for all such cat. A projects.

projects or activities falling in category B shall, however be further subdivided into 2 sub categories, i.e. cat. B-1 & cat. B-2.

Projects falling under cat. B-2 shall not require any EIA report, while projects falling under B-1 cat. shall require EIA reports.

In the original notificⁿ only one type of activity (Township & Area developments project) has been notified as of cat. B-1. Thus there will be no B-2 cat. in this type of projects.

For the rest of the activities the notificⁿ has authorised the MoEF to issue appropriate guidelines for deciding B-cat. projects in to B-1 & B-2 cat.

The B-cat. projects or activity need environmental clearance from state level environmental impact assessment authorities (SEIAA) to be constituted by the central govt.

The SEIAA shall grant ~~envi~~ environmental clearance to B-cat. projects on the recommend of the state expert appraisal committee (SEAC). In the absence of a duly constituted SEIAA or SEAC, a cat-B project shall be treated as cat-A project, needing clearance from MoEF (GoI).

These orders shall be applicable not only all the new activities or projects of the listed types, but shall also include.

7) Expansion & modernisation of existing projects or activities or the listed types with addⁿ of capacity beyond the limits specified for the concerned sector (i.e. the projects or activities which cross the threshold limits given in the schedule (table 22.1), after expansion or modernisation.

Any change in the product mix in an existing manufacturing unit included in schedule table 22.1 beyond the specified range.

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* Stages in the environmental clearance process for new projects under the 2006 notificⁿ:-

The environmental clearance process for new projects will comprise of a maximum of 4 stages, all of which may not apply to particular cases these 4 stages are:-

- stage (1) - screening (only cat.-B projects & activities).
- stage (2) - scoping.
- stage (3) - public consultatⁿ.
- stage (4) - Appraisal.

→ stage (1) :-

In case of cat.-B projects or activities this stage will entail the scrutiny of an applicⁿ seeking prior environmental clearance may be form^d by the concerned state expert.

Appraisal Committee (SEAC) for determining whether or not the project or activity requires further environmental studies for preparation of an EIA for its appraisal prior to the grant of environmental clearance depending upon the nature & local specificity of the projects.

The projects requiring an EIA report shall be termed as cat. B-1 & remaining projects shall be termed as cat. B-2 & will not require an EIA report.

→ Stage (2) :-

Scoping refers to the process by which the expert appraisal committee in the case of cat. - A projects or activities. Instead expert appraisal committee in the case of cat. B-1 projects or activities, including applicant for expansion &/or modernisation &/or change in product mix of existing projects or activities determine detailed & comprehensive terms of reference (TOR) addressing all relevant environmental concerns for the preparation of environmental impact assessment report in respect of the projects for which prior environmental clearance is sought.

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The EAC & SEAC concerned determined the terms of reference on the basis of the information furnished in the prescribed applicⁿ form-1/for 1/A

including terms of reference proposed by the applicant, site visit by a sub-group of EAC or SEAC concerned or other information that may be available with the EAC or SEAC concerned.

All projects & activities listed as cat.-B in item 8 of the schedule (i.e. construction/transport & commercial complexes housing) shall not require scoping & will be appraised on the basis of form-I or form II/A & the constitutional plan.

→ The terms of reference (TOR) shall be conveyed to the applicant by the EAC or SEAC concerned within 60 days of the receipt of form-I.

A hydro electric projects, the terms of reference shall be conveyed along with the clearance for pre construction activities.

If the terms of reference are not finalised & conveyed to the applicant within 60 days of projects of form-I, the terms of reference suggested by the applicant in form-I shall be deemed as the final terms of reference approved for the EIA studies.

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→ Stage - (3) :-

⇒ ⇒ All category A & B-1 projects except the following shall require public consultation prior to their appraisal by the EAC or SEAC.

a) Modernisation of foreign projects.

b) All projects or activities located within industrial estates or parks approved by the

concerned authorities, in which are not allowed in such approvals.

- c) Expansion of roads & highways which don't involve any further acquisition of land.
- d) All building for constructⁿ projects for area developments projects in townships.
- e) All cat. B-2 projects & activities.
- f) All projects or activities concerning national defence & security or other involving strategy consideration is determined by central govt.

⇒ public consultation refers to the process by which the concerns of local affected persons & others who have plausible stake in the environmental impacts of the projects or activities are ascertained with a view to technique in to all all the materials concerns in the projects all activity design, as appropriate.

→ public consultⁿ shall ordinarily had 2 components comprising of -

- a) A public hearing at a site or its close proximity district wise, to be carried out in the manner prescribed & appendix-IV to the notificⁿ. For ascertaining the concerns of local affected person

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- b) Obtain responses in writing from other concerned persons having a plausible stake in the environmental aspects of the project or activity.

⇒ The public hearing at or on includes proximity to, the site in all cases shall be conducted by the state pollutⁿ control board (SPCB) or the Union territory pollutⁿ control community (UTPC) concerned, in the specified manner, who will forward the proceedings to the regulatory authority concerned within 45 days of a request to the effect from the applicant.

⇒ In case the SPCB or UTPCC concerned doesn't under takes & complete the public hearing within specified period, &/or doesn't convey the proceeding of the public hearing within the prescribed period directly to the regulatory authority concerned as above, the regulatory authority shall engage another public agency or authority which is not sub-ordinate to the regulatory authority, to complete the process within a further period of 45 days.

⇒ If the public agency or authority nominated under the sub-paragraph (3) above reports to the regulatory authority concerned that owing to the local situatⁿ, it is not possible to conduct the public hearing in a manner which will enable the use of the concerned local person to be freely expressed, it shall report the facts in detail to the concerned regulatory authority which may after due consideratⁿ of report & other reliable informⁿ that it may have, decide that the public consideratⁿ in the case need n't include the public hearing.

6) For obtaining responses in writing from other concerned person having a plausible stake in the environmental aspect of the project or activity, the concerned regulatory authority & state pollution control board (SPCB) or CTPCC shall invite responses concerned persons by placing on their web site summary EIA report prepared in the format given in appendix - II & II-A, to the notified by the applicant along with a copy of the application in the prescribed form, with in 7 days of the receipt of a written request for arranging the public hearing.

- Confidential informⁿ including non-disclosable or legally privileged informⁿ involving intellectual property right, source specified in the applicⁿ shall n't be placed on the web site. The regulatory authority shall however make available on a written request from any concerned person, the draft EIA report for ~~insert~~ inspectⁿ at notified place during normal office hours till the date of public hearing. All the response received as part of this public consultⁿ process shall be forwarded to the applicant to the quickest available means.

7) After completⁿ of the public consultⁿ, the applicants shall address all the

material's environmental concerns expressed during this process, & may appropriate changes in the draft EIA & EMP (environmental managing plan) addressing all the concerns expressed during public consultⁿ.

* Modificⁿ in the original notificⁿ dated sep 15, 2006 with public hearing:-

- i) On 24-08-2009, the ministry of environment & forests (MoEF) makes public hearing mandatory for expansⁿ of any existing projects, including the once cleared before the new EIA notificⁿ of 2006.
- ii) On 19-07-2010, the ministry of MoEF after a court order, revises the condiⁿ of public hearing asking projects proponents as well as state Poluⁿ control boards (SPCB) to provide adequate time & informⁿ about public hearing to project affected communities.
- iii) On 19-12-2012, the MoEF issues an office memorandum allowing coal mining projects to skip public hearing for 1 time expansⁿ capacity of 25%.

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→ Stage (4) :-

Appraisal means the detailed scrutiny by the ~~EA~~ EAC OR SEAC of the applicⁿ & other documents like the final EIA report out come the public consultⁿ including public

hearing proceeding submitted by the applicant to the regulatory authority concerned for branch environment clearance.

This appraisal shall be made by expert appraisal committee or SEAC concerned need in proceeding to which the applicⁿ shall be invited performing necessary classificⁿ. In person or through or authorised representative.

On the conclusion of this proceeding the EAC or SEAC concerned shall may categorical recommendⁿ to the regulatory authority concerned either for grant of prior environmental clearance on stipulated terms & condiⁿ or the rejectⁿ of the applicⁿ for prior environmental clearance together with reasons for the same.

The appraisal of all projects or activities which are it required to undergo public consultⁿ, or submit an environment impact assessment report, shall be carried out on the basis of prescribed applicⁿ form - I & form - IA as applicable, any other relevant validated Informⁿ available, & the site visit where ever the same is considered necessary by the expert appraisal committee or SEAC concerned.

The appraisal of applicⁿ shall be completed by the EAC or SEAC concerned within 60 days of the receipt of the final environmental impact assessment report & other documents or the receipt of form - I & form - IA, when public consultⁿ is n't necessary & recommendⁿ

Of the expert consultⁿ by expert appraisal committee or SEAC shall be placed before the competent authority for final decision within the 15 days.

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* Prior environmental clearance (EC) process for expansion or modernisation or change of product mix in existing projects:-

→ All applicⁿ seeking prior EC for expansion with increase in the productⁿ capacity beyond the capacity for which prior environmental clearance has been granted under this notificⁿ or with increase in either lease area or productⁿ capacity in the case of mining projects or for the modernisation of an existing unit with increase in the total productⁿ capacity beyond the threshold unit limit prescribed in the schedule to this notificⁿ through change in process &/or technology or involving a change in the product mix shall be made in Form-I & they shall be considered by the concerned EAC or SEAC within 60 days, who will decide on the due diligence necessary including, preparatⁿ of EIA & public consultⁿ & the applicⁿ shall be appraised solely for grant of EC.

* Grant or rejectⁿ of prior EC:-

⇒ The regulatory authority shall consider the recommendⁿ of the EAC or SEAC concerned & convey its decision to the applicant within 45 days of the receipt of the recommendⁿ of the EAC or SEAC concerned or in other

words with in 105 days of the receipt of the final EIA report, & whose EIA is not reviewed, with in 105 days of the receipt of the complete applicⁿ with requisite documents except as provide below.

⇒ The regulatory authority shall normally accept the recommendⁿ of EAC or SEAC concerned in case where it disagrees with recommendⁿ of the EAC or SEAC concerned, the regulatory authority shall request reconsiderⁿ by the EAC or SEAC concerned with in 45 days of the receipt of the recommendⁿ of the EAC or SEAC concerned while stating the reasons for the disagreement. An intensionⁿ of this decision shall be simultaneously conveyed to the applicant. The EAC or SEAC concerned in term shall considered the observatⁿ of the regulatory authority & furnish its views on the same with in the further period of 60 days. The decision of regulatory authority after considering the views of the EAC or SEAC concerned shall be final & conveyed to the applicant by the regulatory authority concerned with in the next 30 days.

⇒ In the event that the decision of regulatory authority is not communicated to the applicant with in the period specified in the sub paragraph 1 & 2 above as applicable

The applicant may proceed as if the environment clearance sought for has been granted or denied by the regulatory authority in terms of the final recommendⁿ of the EAC or SEAC concerned.

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* Post EC mandatory :-

→ It shall be mandatory for the project management to submit half-yearly compliance reports in respect of the stipulated prior EC terms & conditions, in hard & soft copy to the regulatory authority concerned on 1st June & 1st Dec. of each calendar year.

→ All such compliance reports submitted by the project management shall be public documents. Copies of the same shall be given to any person applying to the concerned regulatory authority. The latest such compliance reports shall also be displayed on the website of the concerned regulatory authority.

* Transferability of EC :-

A prior EC granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferee or by the transferor with a written "no objection" by the transferor to, & by the regulatory authority concerned, on the same terms & conditions under which the prior EC was initially granted & for the same validity period. No reference to the EAC or SEAC concerned is not necessary in such cases.

based & air ignations.

iv) Env. management planning.....

A detail env. management planning has to be drawn & submitted with EIA for formulⁿ, implementⁿ & monitoring of env. protectⁿ measures during & after commissioning of the purpose projects.

The new management plan for the plan will ensure that resources are used with maxim^m efficiency to minimise generatⁿ of waste such strategic couldn't only but the polluⁿ control cost but also results in ↑ in the cost of productⁿ.

* The post project management plan is necessary to monitor both the development & subsequent operational activities, the investment EIA is not to be wasted. Post project monitoring (PPM) will secure an immediate advantage in env. management. The ppm when have to find an implement remedial measures for unexpected features adverse impact.

* Methodology for preparing EIA! - IMP.

EIA essentially involves 3 steps!

i) Identificⁿ, ii) predicⁿ, iii) Evaluⁿ of impact.

i) Impact identificⁿ! -

It may carried out with the help of check-list matrices or networks. Check list nearly present a list of env. parameters to be investigate for possible impacts matrices are 2D checklist in which cause effect relationship are established by the listing possible project activities along one axis & potentially impacted env. ed charact. or condiⁿ along the other. Network use illustrate cause - condiⁿ effect

languages as also temporal dimensions & then
for provide the most comprehensive methodology
for impact identification.

ii) Predictⁿ of env. impacts:-

" " " " requires the greatest
degree of scientific applicⁿ. This steps involves
projecting the base line env. setting into the
future with & without the project & then
performing the necessary calculⁿ the predicting real
impacts of the proposed env. development.

iii) Evoluⁿ of impact:-

The " " " in an EIA calls for
conversion of the predicted values the various
env. parameters to a comparable set of units
using system of normalisatⁿ.

The major problem however lies in assigning
monitory values to in tangible env. parameter.
method involving numeric ranking & rating
or weighting or spelling of env. impacts are these
fore commonly used.

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* What is EIA?

Engg. projects involving development of thermal
power, mining operatⁿs & severally water resource
development have been found to be causing certain
adverse & -ve impacts on our surrounding env.
which is forced us to make it compulsory to
evaluate these adverse impact in details well
before the projects is cleared for executⁿ with
this end into all project clearance cells to
evaluate & examine the details env. assessment
report, which is prepared & submitted along
with the DPR (detail project report).

Such submission of env. impact assessment or env. impact statements (EIS) have been made compulsory by the Indian govt. All such impact assessment should thoroughly examine & discuss the various possible env. damages like, water poluⁿ, air poluⁿ, ground poluⁿ, noise poluⁿ or any other kind of env. poluⁿ & their remedial measures, to prevent or to mitigate such hazardous env. effects.

* Env. Impact of thermal power plants:-

Thermal power plants generally use coal as the fuel for producing steam to run their turbines, the product of electricity.

Fuel oil is also some times used as fuel. Use of fuel gas is the most modern advancement in the field.

Fossil fuels include coal & fuel oil when used in the power plants which is very harmful to the air env. as they release very heavy amounts of pollutants into the atmosphere.

Coal releases pollutants like fly ash, sulphur dioxide & nitrogen oxide, whereas oil releases sulphur dioxide & nitrogen oxide as major pollutants.

Thus, coal proves to be a worse fuel & is responsible for poluⁿ in air. Heavy amount of fly ash has been observed to be falling even at distances as large as 3 to 6 km.

Exa. The fallout rates of fly ash at the thermal power plant at Korba in Madhya Pradesh state has been found to be as highest 300 to 550 $\text{t}/\text{km}^2/\text{month}$. in the vicinity of the plant about 130 to 550 $\text{t}/\text{km}^2/\text{month}$ at a distance

Of about 2.5 km. & about 60 to 450 $\mu\text{g}/\text{m}^3$ month at distance of about 24m.

Similarly the Indraprastha & Rajghat power houses at delhi near ITO are responsible for polluting delhis air on large scale dust & fly ash has been thrown by this plant even upto karol bagh about 10km away. This dust fall have now be reduced with the commissioning electrostatic precipitators at this plant. Because the poecipitators catch the particulate matter

In order to reduce the quantum of fly ash produced & consequential air pollution delhi vichet board (DVBB) is also now planning run this plants on fuel gas in place of coal. A gas pipeline existing bet hazira - Bijapur - sagolishpur is being extended by the gas authority of India for bringing fuel gas to this plants

* Impact Evaluation methodologies :-

Name	Salient features
Mc Harg overlay approach	Involves mapping an area & the envial impacts of the project. A shading system indicates the degree of impact. The transparent maps are overlaid to identify visually, the project locat ⁿ giving least impacts. computerised overlays could also be used.
Leopold matrix method	uses matrix of human act ⁿ & envial factors. significant impacts are shown placing a diagonal line in appropriate cell of the matrix. magnitude & importance of impacts are evaluated on a 1-10 scale & placed on either side of the diagonal. The values indicated in the matrix cells are equitable. A written descrip ⁿ of significant impacts as well as activities or envial factors, for which may interact occur, must be presented to enable overall assessment.

Battelle env. al evaluatⁿ system

This method is based on check list of 1-100 parameters. preselected value of each parameter is converted to a 0-1 scale of env. al quality (EQ) using value funⁿ graphs. Each env. al parameter is assigned a wt. out of 100 parameter imp. wt. units (PIU) by ranked pairwise comparison. EQ value is multiplied by PIU to provide env. al score. The final score of the alternative is the difference betⁿ the sum of the scores, with & without the project.

These scores of alternatives are then compared to find the best alternative. It provides a useful technique for comparing the alternatives from an env. al angle. However, numerical scores don't allow comparison with project costs & benefits, which are in monetary units.

Adaptive env. al assessment & manage- ment

A workshop comprising groups of experts is held to consider & define variables such as objectives, indicators, time & spatial boundaries, alternative acts, etc. The core group of experts then develops an explicit computer model of the system, which is later subjected to validity testing & used to develop resilient policies to avoid adverse impacts. Since model is based on understanding of the process as well as components, it simulates behaviour over time & is responsive to different modes of management.

Economic valutⁿ input-output modelling

It stimulates the effect of introducing a project on the economy & the env., using a two-sector model, one sector is the standard economic input-output model for tracing direct & indirect impacts on an economy of injectⁿ of or reduceⁿ in expenditure. The other sector is the env. al sector with flows of ecological commodity inputs & outputs as well as those associated with the final demand. feedback from env. to economic sector is also incorporated.

Cost-benefit analysis

As applicable to EIA, the technique involves monetary valutⁿ of env. al components & natural resources through surrogate markets, direct questⁿing, or voting. These values are used along with the values of commodities consumed by individuals as well as their direct & indirect income to obtain the net change in the agg. income, base on which, alternatives could be compared.

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* Env. al impact of mining!

mining is the extractⁿ of minerals from the earth. mining provides us fuels, metals & the ores, the clays, the rocks, the gold, the diamond etc.

The total no. of mines strictly speaking open cast mines in our country is around 5600 which about 500 mines producing hole & remaining are in the non well sector.

mining activities are accompanied by a variety of env. problems. The process of env. al degradⁿ which ~~start~~ starts with the extractⁿ of minerals resulting in land degradatⁿ & addiⁿ of pollutants in the air & water.

The env. al impact of mining can be broadly divided into 4 parts.

i) water pollutⁿ.

ii) Air

iii) Despollatⁿ including land subsidence, land degradⁿ & deforestation.

i) water pollutⁿ!

mining causes water pollutⁿ in 2 ways, firstly mining causes discharge of acid mine waters into surface water bodies & 2^{ndly} mining adds toxic radio active substances to the water bodies.

mining is also responsible for changing the hydrology of an area in many ways. sometimes mining activities may lower the water table of the area.

ii) Air Pollutⁿ :-

mining causes air pollutⁿ in 2 ways, firstly it adds gases pollutants to the air & 2^{ndly} it emits an adds dust particulates to the atmosph.

Ex^m :- Gases pollutants like sulphur dioxide, oxide of nitrogen, carbon monoxide etc.

Dust particulates produced during ore handling, plastic & transportⁿ.

- mine fires which are largely associated with the underground mining at also in solid waste disposal, also do pollute the atmosph.

iii) Despoilatⁿ of Land :-

The land degradatⁿ effect of mining can be divided into 3 parts :-

→ Land subsidence :-

Due to underground mining the land surface subsides which not only cause damage to buildings & surface range but also some time damages the highways, bridges & sewage lines existing on the ground.

→ Land degradatⁿ :-

Open cast mining removes the top soil & causes deep & large excavatⁿ, pits & cuts.

As such large areas become unstable & denuded vegetatⁿ causing continuous soil erosion. The most imp. by the waste dumps created by open cast as well as underground mining to deplete the erosion & land flex.

→ Deforestⁿ :-

Large scale felling of trees from the forest areas may some times had to be adopted for extractⁿ of valuable minerals deposits from those areas.

During mining dust, dust & over burden spreads on the nearby areas, these by causing large scale damage to the nearby vegetatⁿ.

Large scale deforestⁿ decide causing oxygen deficiency, ~~forest~~ primary conditⁿ which ~~are~~ may result in large scale deaths of wild animals & birds living in the forest causing imbalance to the natural ecology of area.

iv) Noise & ground vibratⁿ :-

The large scale noise cause by mining operatⁿ & vibratⁿ induced into the ground have been established to be a major env. al hazards as it interferences with the hearing & speech communicⁿ, causes distractⁿ, annoyance & ultimately hearing loss.

Heavy ground vibratⁿ may also damage the nearby st^s buildings etc beside causing heritadⁿ to the residences.

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* Env. al Impacts of river valley projects:-

A multi purpose river valley project involving storage of river water by constructing of a dam across river can cause several effects on the river of the area.

Some of these impact may adversely affect the ecology & env. while most others may prove beneficial to the env.

* -ve impacts:-

i) Loss of wild life habitats:-

" " " " & possible extinct of some rare species of the flora & fauna of the area likely to be caused by the submergians of the vast tract of the forested area, needs to be evaluated.

ii) Loss of valuable forest land:-

" " " " & the consequent loss of wood particularly fuel wood should be evaluated.

iii) Loss of agricultural land:-

" " " " due to submergians & consequent loss of food & non food plants or crops & particularly those of vegetable of daily used needs to be evaluated & analysed.

iv) Loss of religious sites:-

" " " " mosques, temples, etc need shifting or relocation? need to be identified.

v) Loss of adventure sports river rafting:-

river runner remain available to the river runner & matters such as impacts to be analysed.

* Displacement of people coming in the submergians zone of the dam:-

The people living in the areas coming under the

Submergents zone of the dam will have to be shifted & relocated. This factor extremely imp. & must be well planned with comparison of liberal spendings.

* Growing pressure & civilizatioⁿ & industrializ^{ation} of nearby areas:-

The increase in popul^{ation} due to dam construction is certainly likely to occur when once the project is completed, bcz the project will ensure availability of water & power & flood free land. Post project effects like salinity & water logging of irrigated^{ated} lands.

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* +ve impact:-

→ Net improvement in public health:-

It is caused due to the availability of ample domestic water supplies leading to overall sanitatioⁿ cleanliness, the better living condit^{ion}.

→ The overall increase in good product^{ion}:-

" " " " " Product^{ion} of crops & wood is certain to occur after the implement^{ation} of the project due to flourishing growth of trees & crops in the irrigated command area of the project.

→ Excellent habitats for fisheries & water birding

The lake created by the dam on its upstream site usually shall provide an excellent habitats for development of fisheries & birds sanctuaries which may properly be planned & evaluated.

→ Development of tourism & recreat^{ion}:-

" " " " " Tourist sports can be made feasible by a dam reservoir.

Boating facilities in the reservoir lake are also developed to increase & induced tourism & recreation. As to provide boost to the env.

→ Improved micro climate! -

It is caused in the adjoining areas due to evaporation of open water surface of a reservoir & from the irrigated command area of the project.

→ Overall improved oxygen product! -

This is caused due to the increased photosynthetic rate from green crops & trees.

→ Development of sanctuaries & wild life! -

Development of wild life sanctuaries becomes feasible when once adequate sweet water becomes available round the year by the implement of dam project.

Sanctuaries can then be well planned & developed for the overall growth of wildlife & promotion of tourism.

→ Conclusion! -

In totality it can be stated that the multi purpose water resource project do not by themselves cause any env. degradation & do generally justify their nature of being in env. harmony.