

APPENDICES

**with the advisory review of the
Environmental Impact Statement
Kasur Tanneries Effluent Treatment
Plant, Punjab Province, Pakistan**

(Appendices 1 to 7)

APPENDIX 1

Letter of DGIS dated August 10th 1993, in which the Commission is asked to submit an advisory report

Ministerie van Buitenlandse Zaken

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Nederlandse Commissie MER
t.a.v. drs. J.J. Scholten
Postbus 2345
3500 GH Utrecht

Directoraat-Generaal
Internationale Samenwerking

Datum
10 augustus 1993

Onderwerp
MER advies Pakistan
Kasur Tannery Pollution Control
Actnr. WW/92/850
volgnummer MER/93/02

Kenmerk
DST/ML 407

Gelet op de overeenkomst die het DGIS met de Commissie voor de MER heeft gesloten op 26 maart 1993, artikel III, lid 2, verzoek ik u een werkgroep samen te stellen en een offerte in te dienen voor een desk-study uit te voeren in Nederland voor in hoofde genoemd projectvoorstel. Als rapport verwacht ik binnen twee maanden akkoord op uw offerte en samenstelling werkgroep, een beoordeling door Cie MER van het door de IUCN opgestelde rapport: Environmental Impact Assessment of Kasur Tanneries Effluent Treatment Plant, februari 1993.

Overige relevante documentatie:

Rapport van Wegelin (NEI) van formuleringsmissie, april 1993
Beide rapporten zijn u reeds met een zendbrief toegegaan.
Voorts zijn er bij DST/ML en DAL/CO nog enige documenten ter inzage.

Gaarne ontvang ik uw offerte, waarna ik u zo spoedig mogelijk zal berichten over het al dan niet akkoord gaan met uw offerte.

DE MINISTER VOOR ONTWIKKELINGSSAMENWERKING,
Voor de Minister,
Het Hoofd van het Speerpuntprogramma Milieu

E.L. Schlingemann

APPENDIX 2

PROJECT INFORMATION

Proposed Activity: The Government of Pakistan, assisted by the Governments of Norway and the Netherlands and the United Nations Industrial Development Organisation plan to contain industrial pollution in the city and the district of Kasur, Punjab province in Pakistan. The pollution is mainly caused by 162 tanneries, that are concentrated in three clusters in the city of Kasur. Project activities comprise promotion of cleaner technologies, liquid waste treatment facilities and solid waste disposal.

Categories: disposal systems, wastewater collection, treatment, reuse and disposal systems.

Project numbers: WW/92/850

Progress: A project proposal is formulated by a joint formulation mission after completion of the Environmental Impact Statement (EIS), which was compiled in support of the formulation. The Commission for environmental impact assessment submitted an advisory review of the EIS to the Netherlands Minister for Development Cooperation on the 13th of January 1994.

The composition of the working group of the Commission for EIA is as follows:

- mr. J.W. Kroon (chairman);
 - ms. I. de Vries;
 - mr. J.S.A. Langewerf;
 - mr. I. van der Putte;
 - mr. Azher Uddin Khan (resource person in Pakistan).
- mr. R.A.M. Post acts as technical secretary of the working group.

APPENDIX 3

TERMS OF REFERENCE OF THE EIS (TOR-EIS) (Summary)

(as established by NORAD, in conjunction with Netherlands aid and UNIDO)

The EIS should assess the environmental effects of:

The pre-treatment plant:

- normal operation of the pre-treatment plant at a rate of 13.000 cum/day and 'self purification' of effluent in the collection system;
- failure of the Dingarh pumping station resulting in reversion of 3.500 cum/day of non treated effluent in the Rohi Nullah and discharge of 9.500 cum/day of pre-treated effluent in river Sutlej;
- failure of the pre-treatment plant possibly resulting in integral discharge of non treated effluent in the drainage canal and river Sutlej.

Sludge treatment and disposal:

- dumping of solid wastes, especially the stability of chromium sludge and groundwater contamination.

Drainage of stagnant lagoons:

- hazard associated with reclamation and reuse and possible uses.

It does so by comparing the forecasted effects to the existing environmental situation. In addition to the assessment of environmental effects, mitigating measures should be recommended.

Methodology:

- study of documents produced by the project and the details of the pre-treatment plant;
- assessment of the reliability of available social and agricultural base-line data;
- assessment of local concerns about the pre-treatment plant, the landfill site and land reclamation;
- collection of hydrological data relating to groundwater quality and quantity around Kasur and relating to annual (monthly) flows in the Sutlej river, the Pandoki Outfall drain;
- collection of quantitative and qualitative data concerning up- and downstream uses and functions of water of river Sutlej;
- assessment of the efficiency of the proposed pre-treatment plant, the quality of effluent under different conditions, dilutions afforded at different times of the year and likely impacts upon receiving water quality and the users of this water. The various zones of influence would be outlined;
- if any of these assessments should prove unfavourable, recommend mitigating measures to protect water users in the event of different scenarios;
- assessment of the hazards involved in different uses for the reclaimed stagnant ponds (housing, agriculture/forestry, industries). Recommendation of the safest use and precautionary measures to be given;

- **assessment of the hazards resulting from tannery solid waste management and disposal, particularly leachate and contamination of groundwater. This should include information on the hydrology and groundwater use;**
- **recommendations for monitoring environmental quality and health.**

APPENDIX 4

REVIEW FOLLOWING THE METHODOLOGY OF TOR-EIS

Study of the documents produced by the project and details of the pre-treatment plant.

The Commission is convinced that documents produced by the project and plant design were profoundly studied by the EIA-team.

Assessment of the reliability of social and agricultural base-line data.

Reliability of data in a base line health survey of the National Management Consultants (NMC), a survey by UNICEF and a report on 'CTA's first mission to Pakistan' was assessed by the EIA-team. The team stresses that the information is unreliable. In the EIS the contents of these reports and surveys remains dim. Some additional qualitative information on health problems was collected by the EIA-team itself. The information, however, was not verified. Moreover part of this information is not grounded on verifiable measuring methods. Morbidity and mortality data were found, but judged of little reliability. No significant causal relationship could be found between health parameters and pollution.

Data on demographic developments, employment, housing and socio-economic issues could not be found by the EIA-team.

NMC reports on Air and Water survey, on Agricultural survey and on Livestock survey were reviewed by the EIA-team and found incomplete and unreliable.

In an additional survey the EIA-team quantifies the financial losses and qualifies negative effects, due to the existence of the stagnant pools.

Assessment of local concern about the pre-treatment plant, the land-fill site and land reclamation.

Local concern about the pre-treatment plant was addressed to some extent by the EIA-team (p. 26/27). A study from UNICEF was reviewed and qualitative sensing of the communities opinion was executed during a field visit.

The EIA-team found out that the treatment plant was **not** the priority of the local community, although the community acknowledged its beneficial effects, especially on water quality. The EIA-team identified water, general sanitation in and around the homes, sewerage and drainage, removal of garbage and reduction of emissions of chemical dusts and fume from tanneries as the citizens priorities.

Local concern about land reclamation was addressed in the same way (p. 27). According to the EIA-team the local community fears aggravation of environmental problems, due to establishment of more tanneries on the reclaimed areas. Local concern about the land fill site was not addressed by the EIA-team.

Collection of hydrological data relating to groundwater quality and quantity and relating to annual (monthly) flows in the Sutlej river and the Pandoki Outfall.

The Commission did not find hydrological data pertinent to groundwater quality and quantity in the EIS. Though the EIA-team makes a reference to a NMC-report on Air and Water survey (p. 33), no information was reproduced.

The EIA-team took some samples from a hand pump at 2 different moments to assess actual self purification of the watercourses and two more 'grab' samples were taken from hand pumps in the town of Kasur. In the opinion of the Commission, however, this data does not give insight in the actual hydrological situation of the groundwater in and around Kasur. As supplies of water for industrial and household uses are completely dependent on groundwater sources, this information is considered essential for the EIS.

The EIS gives hydrological data for annual flows in the Pandoki outfall and the Sutlej river. For the Sutlej river the data refers to the nearest reliable measuring point, some 85 km downstream from the point where Pandoki outfall joins river Sutlej. This data was furnished by the Discharge division of the Irrigation and Power Department of Punjab. The EIA-team accepts them as reliable.

The Commission observes that the flow data for the Pandoki outfall was calculated from climatic data, the hydraulic profile and runoff figures. The calculation is based on average precipitation figures until 1977 (it is not clear how many years) and average precipitation figures over the years '88-'91. As a consequence the calculated flow figures are averages and not absolute minima. From figure 5.12 it can be seen that virtually no flow must have been present in the months of October, November and December of the years 1989, 1990 and 1991. Any effluent would have drained off undilutedly in these periods.

Collection of quantitative and qualitative data concerning up and downstream uses and functions of water of river Sutlej.

The EIA-team concludes (p. 29) that such data is not available for domestic and agricultural purposes. Information on the importance of fisheries is given but, according to the EIA-team, should be viewed with extreme caution (p. 52).

Other possible uses and functions of the water of river Sutlej (industry, drenching of cattle and wildlife, biotope/ecosystem functions, transport) are not addressed in the EIS.

Assessment of the efficiency of the proposed pre-treatment plant, the quality of the effluent under different conditions, dilutions afforded at different times of the year and likely impacts upon receiving water quality and the users of this water. The various zones of influence would be outlined.

The Commission observes, that the EIA-team is ambiguous in its findings with regard to the efficiency assessment in previous reports. The EIA-team's final conclusion is that performance of the pre-treatment plant, as specified by the designing experts, can only be achieved under optimal circumstances and at the specified quantity and quality of input. Climatic conditions affects its efficiency and in cases of warm weather or excess BOD input mechanical aeration and/or increased tank dimensions will be needed. It is concluded that the plant will cause odour nuisance.

The Commission agrees with the most pessimistic vision but concludes that the final report of the joint formulation mission departs from the most optimistic vision.

The Commission observes that the description of the afforded dilutions and impacts on receiving waters does not cover the full range of indicated flow rates. Notably near to zero flow rates, occurring in both the Pandoki outfall and the river Sutlej in winter, are ignored. These circumstances would imply 'worst case' type of situations and should be described. The description of the (negative) impacts merely relates to impacts on fisheries. Effects on other functions and use(r)s are not addressed. No zones of influence are indicated.

If any of these assessments should prove unfavourable, recommend mitigating measures to protect water users in the event of different scenarios.

The Commission observes that recommendations for mitigating measures are formulated in the field of the design of the plant (dimension of tanks, aeration). In case of total failure of the plant the proposed measures relate to deviation of the effluent to the Rohi Nullah as to maximize 'self purification' before entering Sutlej river or blocking of the arm of Sutlej river in which Pandoki outfall discharges. The EIA-team considers correct institutional embedding, funding and management preventive for occurrence of failures.

Assessment of the hazards involved in different uses for the reclaimed stagnant ponds (housing, agriculture/forestry, industries). Recommendations of the safest use and precautionary measures to be given.

The Commission concludes that the hazards of the use of reclaimed land have not been assessed. The EIA-team recommends disposal of contaminated soil (p. 30) and reclamation along scientific lines (p. 48). No recommendations for the safest use are formulated.

Assessment of the hazards resulting from tannery solid waste management and disposal, particularly contamination of groundwater. This should include information on the hydrology and groundwater use.

The EIS assesses hazards resulting from tannery solid waste management and disposal. Site specific hydrological data and data on leachate and groundwater contamination are not given.

Recommendations for monitoring environmental quality and health.

Recommendations for monitoring environmental quality and health are formulated by the EIA-team. The Commission observes that their elaboration reflects the experienced need of reliable base-line data in establishing this EIS.

APPENDIX 5

REVIEW FRAMEWORK FOR THE EIA KASUR

The review framework will consist of the following subjects:

1. points of departure, problem analysis, objectives and decision making;
2. the intended activity, alternatives and accompanying mitigating measures;
3. description of the prevailing condition of the environment and its evolution in case no activity would be undertaken;
4. environmental impact of the intended activity and its alternatives;
5. comparative screening of the intended activity and its alternatives on environmental impact;
6. remaining gaps in knowledge and post-project evaluation;
7. summary.

1 Points of departure, problem analysis, objectives and decision making

- 1.1 The EIS should indicate the *points of departure* on which the project is based. These would include aspects of degradation of the environment, aspects of public and occupational health and wellbeing, delicacies in institutional structure and functioning and public participation, economic and social circumstances (including gender-related issues) and aspects of production related technology and technicity.
- 1.2 The *problem analysis* should include a clear description of bottlenecks with regard to aspects as described under paragraph 1.1, with special emphasis on institutional delicacies, public participation and social and economic circumstances. The analysis should attempt to assess the risks of, and possible reasons for failure of the intervention.
- 1.3 The *objectives* should be formulated explicitly and should be rooted in the problem analysis as described under 1.2. They should cover all aspects of this analysis with exception of those, addressed by other existing or scheduled initiatives. These initiatives should be described in a separate chapter (see 1.4). Problem analysis and objectives are formulated independently of the intended activity and in such a way that they may equally apply to all relevant alternative initiatives.
- 1.4 **Development programmes and policies** limiting or influencing the scope of the objectives should be discussed in the EIS.
- 1.5 The EIS should clearly state the *decision* in support of which it is written. Moreover it should contain an overview over previous decisions and legal provisions conditioning the actual decision to be made.

2 Intended activity, secondary effects, alternatives, mitigating measures.

2.1 the *intended activity and the alternatives* should lead to a realisation of the objectives formulated.

- Observes the EIS, in addition to the intended activity, possible alternatives sufficiently? One can think of prevention of pollution in the enterprises (in-house arrangements), reuse of wastes.
- To what degree does the intended activity (and its alternatives) contribute to an improvement of the condition of the environment on a short term basis and may it be preventive for structural (long term) improvement of the environment?

2.2 the intended activity must be clearly and completely described, particularly those parts influencing the environment. Special attention should be paid to the institutional setting, in which the activity and parts thereof must be realised and must function. Four stages can be distinguished in the realisation of the intended activity:

2.2.1 the preparatory stage (feasibility-study):

Base-line data:

- review and assessment of the reliability of available relevant data;
- collection of hydrological data (recorded flows, groundwater);
- collection of information concerning beneficial uses of water bodies (irrigation, water supply, fisheries, wildlife, industry);
- spot sampling and site measurements if necessary;
- quantities of wastes of different categories produced and forecasted development;
- collection of remaining missing base-line data;
- methods and scope of sensing populations attitudes towards intended initiatives.

Long term planning:

- description of an overall long term planning of sanitation of the town and the district of Kasur.

Technical data on the initiative:

- technical data on the effluent collection system, the final outfall, the chromium-recovery plant, the effluent pre-treatment plant, the solid waste disposal facilities.
Justification of their location, their design and capacities (effectiveness, efficiency, remaining emissions under various circumstances, safety margins observed);
- description of techniques to be used to eliminate stagnant pools and assessment of the hazards involved in the use of the reclaimed areas;
- how does the design of the effluent collection system, the effluent pre-treatment plant, the final outfall and the solid waste disposal facilities cope with excessive precipitation?
- does the design of the structures allow for future upscaling or upgrading (modular structure)?
- design-related security arrangements in case of failure of one or more parts of the system;

Such alternatives can be realised as follows:

- Within the framework of the existing programme a shift of about 150.000 US\$ e.g. from the too expensive chromium-recovery unit and possibly other budgets could take place in order to (partly) finance the essential aeration capacity.

In view of the foregoing, installment of about 20 kW in each of the 14 (well to dimension) lagoons seems most useful.

- Financial arrangements should be made for structural involvement of leather technologists (at least after completion of the project) from Pakistani Institutions to implement high exhaustion chromium tannage and recycling techniques in preparation of installment of optimal UASB treatment systems.

In such a way the still very limited aerated lagoon system and low cost chromium recovery technique, introduced in the first phase, positively stimulates tanneries to an end situation of low sulfate, chromium and COD emission. Moreover it can effectively prepare for a high yield integral UASB/aerated lagoon treatment system for industrial and municipal waste water with relatively low O&M costs.

- Whatever type of sewerage treatment adopted, it will have to be accompanied by a suitable monitoring programme. Effluent quality must be monitored on a regular basis for BOD, chromium and sulfate.
- As mitigating measure for inadequate functioning or complete failure of the central treatment, a buffering basin should be provided.

- design-related mitigating measures to avoid environmental damage in case of calamities;
- design-related facilities to avoid nuisance and health hazards caused by animals (rats, birds) and wind (drifting pollutants).

Institutional aspects and sustainability:

- the institutional framework in which realisation, operation and maintenance of the various structures will take place;
- funding of operation and maintenance costs and of relief costs in case of calamities;
- public acceptance, involvement and participation.

2.2.2 the stage of construction of project infrastructure:

- measures to avoid environmental damage due to displacement of polluted materials (soil, effluent, solid wastes);
- facilities for employees (safety, health);
- mitigating measures (prevention and repair of erosion, disturbance of archeological sites or environmental damage caused by construction activities, aesthetical adaptation).

2.2.3 the stage of exploitation:

- training facilities for employees and staff;
- description of the functioning of the various structures under normal circumstances and in situations of stress;
- procedures for maintenance of the structures and measures to prevent environmental damage due to maintenance activities;
- procedures in case of calamities;
- security arrangement for employees and staff;
- monitoring facilities and procedures.

2.2.4 the stage of evaluation of performance:

- has a long term monitoring and evaluation plan been foreseen?

2.3 have all eventual *secondary effects* of the initiative and its alternatives been identified and described (including measures to prevent or diminish environmental damage thereof)?

2.4 have all relevant *alternatives* been identified and described (according to the aspects mentioned under 2.2)?

2.5 does the EIS describe the *alternative most friendly to the environment* for the various parts of the alternative?

2.6 do *mitigating measures* (measures to prevent or diminish environmental damage) form an integral part of the description of the intended activity and its alternatives? (To a substantial degree these measures result from the description of the environmental effects foreseen).

3 description of the prevailing **environmental** conditions and its evolution in case no activity would be undertaken

3.1 The *prevailing condition of the environment* is described in order to facilitate forecasting of:

- the environmental impact of the intended activity and its alternatives;
- the autonomous development of the environment in case the intended activity nor its alternatives are implemented.

As a consequence the description of the prevailing condition of the environment can be limited to those aspects that will be subject to change due to implementation of the intended activity or its alternatives.

The description of the autonomous development of the environment serves as reference for the comparison of the environmental impact of the intended activity and its alternatives. It also identifies future environmental bottlenecks in case no action is undertaken and thus provides clues on whether the 'no action' alternative should be observed as realistic.

3.2 **The location and extent of the study area**, for which the EIS was established should be clearly delimited and motivated. It may vary per type of environmental effect. For instance for the effect 'water pollution' both the basins of the Rohi Nullah and Sutlej river are involved whereas 'soil pollution' may be limited to the solid waste disposal site, to the city of Kasur and the stagnant pools and its surroundings.

3.3 The following aspects are essential in the description of the prevailing situation and the autonomous development of the environment in the study area:

Population:

- demographic data like actual population and population growth;
- source of income and dependence on natural resources as far as they might be affected by the intended activity or its alternatives. (agriculture, silviculture, fisheries, hunting, trade, transport, recreation). This is important to evaluate possible economic impacts;
- the socio-economic situation of the population and their perception of the sanitary conditions in which they live. Assessment of the financial capacity and willingness to pay for improvement of these conditions. (Distinction should be made here between man and women as judgement may vary considerably).

Health:

- the actual state of health of various groups of the population should be analysed and related to basic health, availability and quality of drinking water, sanitary and housing facilities;
- a list of tannery-chemicals and risk for allergies, intoxications and related health hazards;
- the expected contribution of existing stagnant ponds and solid tannery wastes dispersion to nuisance as result of stench and insect pests;
- the expected contribution to the same nuisance of communal solid waste dispersion and malfunctioning of the communal sewer system.

Water:

- actual quality of the waters of the Rohi Nullah, Pandoki Outfall and the Sutlej river [temperature, salt concentration and sources (industrial, natural), oxygen, nutrient content and other physical-, chemical and biological parameters];
- river ecosystems, population data for fish, salt and oxygen sensitive species;
- availability, origin and quality of water for use in tanneries and households
- agricultural use and origin of water polluted by effluent (quantity and quality).

Soils and land:

- nature and degree of pollution of the soils under the stagnant pools and adjacent area (depth of penetration and area with substantially increased concentrations of chloride, sulphate and chromium);
- chemical and physical soil properties of these soils and speed of diffusion of pollutants;
- land ecosystems (vegetations, (rare) animal species).

Air:

- air quality (odour, dust).

Culture:

- effects on valuable cultural objects.

Nature reserves:

- possible presence of nature reserves in the study area.

4 Environmental impact of the intended activity and its alternatives

- 4.1 Impacts should be described for the intended activity *and its alternatives*.
- 4.2 Both positive (improved sanitary conditions, reduction and prevention of environmental degradation) and negative effects (increased risk of occurrence of environmental effects and calamities) should be described.
- 4.3 Applied research methodology and its limitations should be discussed.
- 4.4 The following aspects should be observed describing the impact of the intended activity and its alternatives:

Population:

- temporal or permanent decline or increase of the sources of income for (parts of) the population in the study area, based on the national resources;
- degradation of agricultural, piscicultural or other economy related potential downstream river Sutlej;
- possible effects on population figures by increased attractiveness by improved living conditions;
- opinion of the local communities involved in relation to the intended activity and the alternatives;
- degree of involvement/participation of local communities and effects on communal identity and organisation.

Health:

- change of sanitary conditions and effects on public and occupational health;
- change in tanning practices and effects on working conditions and occupational health.

Risks and security:

- legal aspects concerning land ownership;
- risk of occurrence of malfunction of the institutional framework in which operation and maintenance of project structures should take place and environmental effects hereof;
- risk of occurrence of financing deficits and its environmental effects;
- risks of use of reclaimed areas;
- risk of occurrence of failure of the treatment plant and the pumping station and environmental effects (river Sutlej);
- risk and effects of indifference of the population in relation to the functioning of the proposed infrastructure;
- impacts of the solid waste disposal system under normal and severe (climatic) circumstances.

Water:

- effects on the water quality (including drinking water) of the intended activity and its alternatives under normal operating conditions (physical, chemical parameters, growth of undesirable organisms like pathogens, vectors);
- effects of the changes in water quality on agriculture, fisheries and other economic activities downstream river Sutlej.

Soils and land:

- effects on valuable landscapes;
- impact on vegetations and (rare) animal species;
- impact on the land under the stagnant pools.

Air:

- changes in air quality (dust, odour and hairs).

Culture:

- impact on valuable historical, religious and archeological objects;
- improvement of attractiveness of the city of Kasur.

5 Comparative screening of the intended activity and its alternatives on environmental impact

- 5.1 The *alternatives should be compared per type of impact*. The autonomous development of the environment as described under chapter three should serve here as situation of reference.
- 5.2 The EIS should indicate in which way each of the observed alternatives achieves the objectives formulated.
- 5.3 The comparison of the alternatives on environmental impact *and on achievement of objectives* should lead to an order of preference per impact. Combination of these orders should culminate in formulation of the '*preferred alternative*', which may differ from the intended activity due to the process of EIA.

6 Remaining gaps in knowledge and post-project evaluation

- 6.1 The EIS should include a overview of remaining gaps in knowledge and their significance for the intended activity. Uncertainties with respect to environmental impacts are part of this overview.
- 6.2 The EIS should schedule an *evaluation programme* including:
- a research programme filling remaining gaps in knowledge as far as relevant for the implementation of the intended activity;
 - a monitoring programme, evaluating actually emerging impacts on the environment and the effectiveness of mitigating measures implemented.

7 Summary

The Summary should present the main elements of the EIS.

PART I

Acts, Ordinances, President's Orders and Regulations, including Martial Law
Orders and Regulations

GOVERNMENT OF PAKISTAN

MINISTRY OF LAW AND PARLIAMENTARY AFFAIRS
(Law Division)

Islamabad, the 31st December, 1983

No. F. 17 (1)/83-Pub.—The following Ordinance made by the President is hereby published for general information :—

ORDINANCE No. XXXVII of 1983

AN

ORDINANCE

*to provide for the control of pollution and preservation of living
environment*

WHEREAS it is expedient to provide for the control of pollution and preservation of living environment and for matters connected therewith or ancillary thereto;

AND WHEREAS the President is satisfied that circumstances exist which render it necessary to take immediate action;

NOW, THEREFORE, in pursuance of the Proclamation of the fifth day of July, 1977, and in exercise of all powers enabling him in that behalf, the President is pleased to make and promulgate the following Ordinance :—

1. Short title, extent and commencement.—(1) This Ordinance may be called the Pakistan Environmental Protection Ordinance, 1983.
- (2) It extends to the whole of Pakistan and its territorial waters, Exclusive Economic Zone and historic waters.
- (3) It shall come into force on such day as the Federal Government may, by notification in the official Gazette, specify in this behalf.

2. **Definitions.**—In this Ordinance, unless there is anything repugnant in the subject or context,—

- (a) "Agency" means the Pakistan Environmental Protection Agency ('PEPA) established under section 5;
- (b) "Air pollutant" means any substance that causes alteration in chemical, physical, biological or radiological integrity of air and includes soot, smoke particulates, combustion exhaust gases, obnoxious gases and radioactive substances;
- (c) "Council" means the Pakistan Environmental Protection Council established under section 3;
- (d) "discharge" means spilling, leaking, pumping, pouring emitting, emptying or dumping;
- (e) "effluent" includes any material in solid, slurry, suspension, liquid, vapour, fumes or gaseous form coming out as or from any industrial activity or any other source;
- (f) "effluent standards" means the permissible limits prescribed by the Agency regarding the quality and quantity of effluents and wastes;
- (g) "emission standards" means the permissible standards for emission of air pollutants prescribed by the Agency;
- (h) "Exclusive Economic Zone" shall have the same meaning as in the Territorial Waters and Maritime Zones Act, 1976 (LXXII of 1976);
- (i) "Government agency" includes a division, department, bureau, section, commission, board, office or unit of the Federal Government or a Provincial Government;
- (j) "historic waters" means such limits of the water adjacent to the land territory of Pakistan as are for the time being specified by notification under section 7 of the Territorial Waters and Maritime Zones Act, 1976 (LXXXII of 1976);
- (k) "industrial activity" means any process for manufacturing, making, altering, repairing, ornamenting, finishing, packing or otherwise treating any article or substance with a view to its use, sale, transport, delivery or disposal or for pumping oil, water or sewage or for generating, transforming or transmitting power;
- (l) "industrial waste" means waste resulting from an industrial activity;
- (m) "local authority" includes any agency set up or designated by the Federal Government or a Provincial Government to be a local authority for the purposes of this Ordinance;

- (n) "local council" means a local council constituted or established under a law relating to local government;
- (o) "municipal waste" includes sewage, refuse sludge and human excreta and the like;
- (p) "pollution" means any matter which, on being discharged into the air, soil or public waters, alters unfavourably the chemical, physical, biological or radiological integrity of the air, soil or public waters or, by itself or in combination with other discharges, is likely to make the air, soil or public waters unclean, noxious or impure or injurious or disagreeable or detrimental to the health, safety, welfare or property of persons or harmful to aquatic life, animals, birds, fish, plants or other forms of life;
- (q) "prescribed" means prescribed by rules or regulations;
- (p) "public waters" means water areas in public use and includes streams, nullahs, canals, seepage drains, natural or artificial water courses, rivers, wells, ponds, ditches, lakes reservoirs, underground or artesian water, territorial waters, the Exclusive Economic Zone and historic waters;
- (s) "regulations" means regulations made under this Ordinance;
- (t) "rules" means rules made under this Ordinance;
- (u) "sewage" means liquid wastes from sanitary conveniences, kitchens, laundries, washing and the like;
- (v) "standards" means effluent standards and emission standards;
- (w) "territorial waters" shall have the same meaning as in the Territorial Waters and Maritime Zones Act, 1976 (LXXXI of 1976);
- (x) "treatment works" means the various processes and devices used in the treatment of wastes; and
- (y) "wastes" includes liquid wastes, solids wastes, industrial wastes, municipal wastes, wastes from mining processes and wastes from farm and agricultural activities such as poultry, cattle, animal husbandry, abattoirs and the use of fertilizers and pesticides.

3. **Establishment of the Council.**—(1) The Federal Government shall, by notification in the official Gazette, establish a Council to be known as the Pakistan Environment Protection Council and consisting of:

- (i) the President of Pakistan Chairman.
- (ii) the Minister incharge of the subject of Environment Vice-Chairman.

- (iii) Ministers incharge of the subject of Environment in the Provinces . . . Members.
- (iv) such other persons as the Federal Government may appoint . . . Members.
- (v) the Secretary to the Government of Pakistan dealing with the subject . . . Secretary.

(2) The members of the Council, other than ex-officio members, shall hold office for a term of three years.

(3) The Council shall frame its own rules of procedure.

(4) The Council shall hold meetings as and when necessary :

Provided that not less than two meetings shall be held in a year.

(5) The Council may, by general or special order and subject to such conditions as it may consider fit, delegate any of its functions under this Ordinance to a Committee or any member of the Council.

4. Functions of the Council.—(1) The functions of the Council shall

be to—

- (a) ensure enforcement of this Ordinance;
- (b) establish comprehensive national environmental policy;
- (c) give appropriate direction to conserve the renewable and expendable resources;
- (d) ensure that environmental considerations are interweaved into National Development Plans and Policies;
- (e) ensure enforcement of the National Environment Quality Standards; and
- (f) give directions to any Government agency, a body or a person requiring it or him to take measures to control pollution being caused by such agency, body or person or to refrain from carrying out any particular activity prejudicial to public interest or the purposes of this Ordinance.

(2) The Council may, or if so required by the Government or any Government agency shall, direct the Agency to prepare, submit and promote projects for the prevention of environmental pollution or to undertake research in any specified aspect of environment.

5. Establishment of the Agency.—(1) The Federal Government shall, by notification in the official Gazette, establish an Agency to be called the Pakistan Environmental Protection Agency to exercise the powers and perform the functions assigned to it under the provisions of this Ordinance or the rules and regulations.

(2) The Agency shall be headed by a Director-General who shall be appointed by the Federal Government on such terms and conditions as it may determine.

(3) The powers and functions of the Agency shall be exercised and performed by the Director-General.

(4) The Agency shall have such administrative, technical and legal staff as the Federal Government may appoint.

(5) To assist him in the discharge of his functions, the Director-General may establish such Advisory Committees as he may deem fit and appoint as members thereof eminent representatives of universities, research institutes, the business community and other professions and fields of knowledge.

6. Functions of the Agency.—(1) The Agency shall—

- (a) administer this Ordinance and the rules and regulations;
- (b) prepare national environmental policy for approval of the Council;
- (c) publish an annual report on the state of environment;
- (d) establish National Environmental Quality Standards with the approval of the Council;
- (e) revise the National Environment Quality Standards as and when deemed necessary;
- (f) coordinate environmental policies and programmes nationally and internationally;
- (g) establish systems for surveys, surveillance, monitoring, measurement, examination and inspection to combat environmental pollution;
- (h) take measures to promote the development of science and technology which will contribute to the prevention of environmental pollution, such as the consolidation of survey and research system, the promotion of research and development, the dissemination of the results of such research work

and development work, and the education and training of research experts and other governmental functionaries; provide information and education to the public on environmental matters and to recommend to the Council the introduction of environmental information in the syllabi of educational institutions; and

(j) coordinate and consolidate implementation of measures to control pollution with Provincial Governments and other Government agencies.

(2) The Agency may—

- (a) request any Government agency to furnish any information or data relevant to the functions of the Agency;
- (b) with the approval of the Federal Government, initiate requests for foreign assistance in support of the objectives of this Ordinance and enter into arrangements with foreign agencies or organisations for the exchange of material or information and participate in international seminars or meetings;
- (c) establish and maintain laboratories to conduct research in various aspects of environment and provide grants to institutions for specific projects;
- (d) delegate any of its powers under this Ordinance and the regulations to any Government agency;
- (e) identify the needs for legislation in the environmental field;
- (f) at the request of the Federal Government or a Provincial Government or any Government agency, provide advice and assistance in environmental matters; and
- (g) perform any other function which the Council may assign to it.

7. Powers of the Agency.—Subject to the provisions of this Ordinance, the Agency may—

- (a) lease, purchase, acquire, own, hold, improve, use or otherwise deal in and with any property, both movable and immovable;
- (b) sell, convey, mortgage, pledge, exchange or otherwise dispose of its property and assets;
- (c) execute instruments, incur liabilities and do all acts or things necessary for proper management and conduct of its business; and

(d) appoint such advisers and consultants as it considers necessary for efficient performance of its functions on such terms and conditions as may be prescribed by regulations.

8. Environmental impact statement, etc., to be submitted to the Agency.—(1) The provisions of this section shall apply to such—

- (a) persons or class of persons, or
 - (b) industrial activity or class of industrial activity, or
 - (c) category, type or volume of discharges of air pollutants or wastes, or
 - (d) area or class of areas, or
 - (e) classes of public waters.
- as may be prescribed by regulations.

(2) Every proponent of a project the construction or completion of which is likely to adversely affect the environment shall file with the Agency, at the time of planning the project, a detailed environmental impact statement including information on:

- (a) the impact on the environment of the proposed industrial activity;
- (b) the treatment works of the proposed project;
- (c) the unavoidable adverse environmental effects of the proposed project; and
- (d) the steps proposed to be taken by the project proponent to minimise adverse environmental effects.

(3) The Agency may prescribe guidelines for the preparation of environmental impact statements and, where such guidelines have been prescribed, the proponents of projects shall prepare environmental impact statements according to the said guidelines.

(4) The Agency may itself or through the appropriate Government agency review the environmental impact statement and, where it deems appropriate, it may also involve public participation in the assessment of the environmental impact statement.

(5) After the review under sub-section (4), the Agency may either approve the environmental impact assessment or recommend to the Federal Government that the project be modified or rejected in the interest of environmental objectives.

9. Agency to assist local councils, etc., in disposal of wastes.—The Agency shall assist the local councils, local authorities or other Government officers and persons to implement schemes for the proper disposal of wastes with the standards and procedures prescribed by the Agency.

10. Funds of the Agency.—The funds of the Agency shall be derived from the following sources, namely:—

- (a) grants made and loans advanced by the Federal Government or the Provincial Government;
- (b) grants, loans, advances and other moneys received from local or international agencies;
- (c) fees, rates and charges received by the Agency under the provisions of this Ordinance; and
- (d) all other sums received by the Agency.

11. Audit and accounts.—(1) The Agency shall submit its annual budget estimates for approval of the Federal Government through the Council.

(2) The Agency shall maintain proper accounts and other relevant records and prepare annual statement of accounts in such form as may be prescribed by rules.

(3) The accounts of the Agency shall be audited in such manner as may be directed by the Federal Government.

12. Penalty.—(1) Whoever contravenes or fails to comply with any provision of this Ordinance or of any rule or regulation or any direction issued by the Agency thereunder, shall be punishable with imprisonment for a term which may extend to two years, or with fine which may extend to one hundred thousand rupees, or with both, and in the case of a continuing contravention or failure, with an additional fine which may extend to ten thousand rupees for every day after the first during which such contravention or failure continues.

(2) The Director General or an officer generally or specially authorised by him in this behalf may compound any offence under this Ordinance.

13. Indemnity.—No suit, prosecution or other legal proceeding shall lie against the Council, the Agency, the Director General, or the members,

officers, employees, experts or consultants of the Agency for anything in good faith done or intended to be done under this Ordinance or any rule or regulation.

14. Bar of jurisdiction.—No Court shall take cognizance of any offence punishable under this Ordinance except on a complaint in writing made by the Agency.

15. Dues of Agency recoverable as an arrear of land revenue.—Any dues recoverable by the Agency under the provisions of this Ordinance or any rules or regulations shall be recoverable as an arrear of land revenue.

16. Power to make rules.—(1) The Federal Government may, by notification in the official Gazette, make rules for carrying out the purposes of this Ordinance.

17. Power to make regulations.—(1) The Agency may, by notification in the official Gazette, with the approval of the Federal Government, make regulations, not inconsistent with the provisions of this Ordinance or the rules, for carrying out the purposes of this Ordinance.

(2) In particular and without prejudice to the generality of the foregoing power, such regulations may provide for the levy of fees, rates and charges in respect of services rendered, actions taken and schemes implemented by the Agency.

GENERAL.

M. ZIA-UL-HAQ.

President.

C. A. RAIIMAN,

Secretary

APPENDIX 7

DETAILED TECHNICAL RECOMMENDATIONS

In addition to the recommendations presented in the advice, the Commission would like to present a set of more detailed technical recommendations.

With regard to the tannery sector the Commission advises to adopt the following procedure:

Viable alternative in-house arrangements should be worked out. The effectiveness of these arrangements determines the technical criteria to be imposed on a central treatment plant. On the basis of these criteria alternatives for this central treatment plant should be elaborated. All viable combinations of alternatives should be screened quantitatively applying the following criteria:

- overall environmental effectiveness;
- cost-effectiveness;
- socio-economic impact.

The description of all considered alternatives, including their environmental effectiveness, cost-effectiveness and socio-economic impacts should form the basis for sound decision making on the subject.

On a recommendatory basis the Commission would like to mention some alternatives that might be considered.

Alternative in-house arrangements could be:

- introduction of high-exhaustion chromium tanning and/or chromium recycling by means of existing technologies (e.g. EC demonstration project Athens 1990/1991). In this way chromium and sulfate emissions are greatly reduced.
- centralisation of existing hazardous production of chromium tanning materials from chromate.

Alternative central treatment facilities:

- Reduction of the sewerage chromium and sulfate load opens up the possibility of effective waste water treatment by means of UASB-reactors¹. These reactors may reduce COD-load to 40% of the original COD-load and produce methane gas. Residual COD and BOD can be treated effectively together with municipal waste water in mechanically aerated lagoons of the dimensions proposed in the project documents. Biogas can be used as energy source to reduce O&M costs.

Preceding the realisation of process integrated measures, useful alternatives comprise optimisation of the lagoon surface versus mechanical aeration.

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1 Upflow Anaerobic Sludge Bed reactor