NWFP Environmental Protection Agency

Environmental Assessment Checklists and Guidelines

Carpet Manufacturing Units

No:	Version: **B**	Date: **21 May 2004**	Page **1** of **14**

Contents

1. Introduction

Pakistan has made a successful transition from an agrarian economy, with only a handful of manufacturing units at the time of independence, to a semi-industrialized country where manufacturing accounts for 18.2 percent of GDP. This increased industrial growth, at the other hand, is causing a social cost in terms of deteriorating the environment. A trade-off is needed to be evaluated between the development and environment.

1.1 Scope of the Guidelines

These guidelines are applicable to the future developments of carpet manufacturing units in the province of NWFP.

1.2 How to These Guidelines

The project proponent (the local government, municipal government, city government or the cantonment board) is obliged to use these guidelines. The project proponent has to fill in an environmental impact assessment form.

The following steps are to be taken in this regard:

Step 1: Provide information on project [use **Section I**]

Step 2: Determine Applicability (*Are you sure that IEE or EIA is not required?*) [use **Section II**]

Step 3: Describe the physical, biological and social environment [use **Section III**]

Step 4: Assess potential impacts and applicable mitigation measures [use **Section IV**]

Step 5: Provide undertaking to the EPA on mitigation measures and compliance [use **Section V**]

Completed form is to be submitted to the NWFP Environmental Protection Agency for evaluation. NWFP EPA may request for additional information or decide to undertake visit to the proposed project site in order to assess the environmental impact of the proposed project.

1.3 Glossary

Act means the Pakistan Environmental Protection Act, 1997

Biological Oxygen Demand (BOD) BOD is a measurement of oxygen required by bacteria to oxidize (stabilize) the organic matter in the wastewater.

Dust are fine powdery material such as dry earth or pollen that can be blown about in the air

Environment means (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the inter-relationships between any of the factors in sub-clause (a) to (f).

Environmental Assessment a technique and a process by which information about the environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming their judgments on whether the development should go ahead.

Impact on Environment means any effect on land, water, air or any other component of the environment, as well as on wildlife harvesting, and includes any effect on the social and cultural environment or on heritage resources.

Liquid Effluent is the used water coming out of the carpet-manufacturing unit

Mitigation Measure means a measure for the control, reduction or elimination of an adverse impact of a development on the environment, including a restorative measure.

Regulations means the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations, 2000

Screening subjecting the liquid effluent to pass through bar screens for the removal of large objects

Sedimentation means settling of particles by gravity

2. Project Profile

2.1 Project Description

In a formal carpet-manufacturing unit the operations generally undertaken are described below:

Carding

Carding is the process of combing and cleaning the wool. Since wool is the basic raw material for carpet making, it should fine and clean. In an effective carding, no fiber is intermingled with another and all foreign particles and dirt are removed. This helps in spinning, blending and wool mixing if necessary. Carding is done by hand and also done using machines.

Spinning

After carding, the wool fibers are drawn and twisted to make yarns of desired thickness. This process is called spinning. The yarn of soft 5-7 twist per inch is said to be ideal for carpets. Spinning is a traditional skill and generally wool is spun by hands. Though hand-spun yarns have uneven structure, they provide a special look in a carpet. The wool should be well carded to obtain even yarns of desired thickness. Increasingly, machines are also being used for spinning as it is more efficient.

Dyeing

Dyeing wool can be quite a complicated process. It needs a lot of attention and experience to obtain wool of desired colour. The wool can be dyed either using natural dyes or synthetic dyes, and both have good and adverse effects.

Using natural dyes is more complicated and the colours obtained are not that brilliant, but it promotes special textures of carpets and is less harmful to the environment. On the other hand, synthetic dyes provide brighter colours in various shades with relative ease which is not possible with natural dyes. Chemical dyes are therefore used but natural dyes are also used whenever demanded.

Weaving

The real making of carpets begins with weaving. A loom is a wooden frame which holds the carpet while it is being woven. There are two major kinds. One is the vertical loom and the other is the horizontal loom. A vertical loom consists of four bars. Two are horizontal—one at the top and one at the bottom. The other two go vertically from side to side so that it looks like a standing frame. The warp yarns are fixed between the top and bottom bars. A horizontal loom is simpler in structure. It is framed by four bars, looking like a quadrangle lying on the ground. The length of a carpet is determined by the distance between the top and bottom bars and the width by the two side bars and carpets woven on it are generally smaller. As on a vertical loom, the warp yarns are fixed between the top and bottom bars, too.

For hand woven carpets it is very time consuming and laborious. A good weaver can weave about 4-5 square meters in one month. While weaving, a row of pile yarns are knotted to the wrap

yarns firstly. Next two weft yarns are woven through the wrap. The knots and weft yarns are then packed down tightly on previously woven rows with a comb-like device. After knotting several rows, ends of pile yarns are cut to create an even rug surface. The knotting process is then repeated. The knot density of a carpet ranges from 40 to several hundred knots per square inch. However, the most common knot density of carpets are 60, 80 and 100 knots per square inch.

Washing

After a carpet is woven it is washed to remove dirt and to restore the original shine of the wool. Washing brings sheen and lustre, and therefore, it is as important a step as colouring, designing and weaving. This is the final stage of carpet weaving and hence requires a lot of careful handling. Before washing, the carpet may go through the stage of burning the back of the carpet, rubbing with wired brush etc. to make it even. Washing is done with water mixed with soap, bleaching powder and other natural chemicals. After washing, the carpet is kept in the sunlight for drying and then it is sent for clipping.

2.2 Environmental Aspects

Small carpet manufacturing units (which come under scope of guidelines) have no significant environmental impacts. There is no noise and gaseous emissions involved. Environmental impacts usually caused by a carpet-manufacturing unit are:

- Discharge of effluent
- Dust and wool emissions
- Smell
- Solid wastes

Discharge of Effluent

During dying and washing processes liquid waste is generated. This waste has high Biological Oxygen Demand (BOD) and is colored in appearance. BOD and color is due to use of dyes, chemicals and soaps during the dying and washing processes.

Dust and Wool Emissions

Dust and wool emissions during carpet weaving may cause lung disease to workers upon extended exposure.

Smell

Use of dyes and chemicals brings about smell. This smell is only limited to the carpet manufacturing unit's internal atmosphere and does not cause nuisance to the surrounding communities.

Solid waste

Finishing generates solid waste, which is usually discarded in open or in a water body.

2.3 Mitigation Options

- To mitigate the environmental impacts caused by a carpet-manufacturing unit following mitigation measures can be adopted:

Discharge of effluent

- Good housekeeping
- Control of the amount of chemicals used in dying and washing
- Replacement of soap with detergent
- Liquid effluent will not be discharged into a river, stream or any water body.

- Liquid effluent will be treated by screening and sedimentation before being discharged into sewer.

Dust and wool emissions

- Proper ventilation and use of dust markers

Smell

- Providing workers with nose coverings
- Proper ventilation

Solid waste

- Installation of incinerator for solid waste burning
- Solid waste burning at any government approved burning pit
- Selling of solid waste to outside contractors
- Handing over solid wastes to municipal authorities

Environmental Assessment Checklist

Section I: Project Description

File No _____ (To be filled by EPA)

Date _____

General Information

1. Project Name or Title_____
2. Project Proponent (Department, organization, or owner) _____
3. Address _____
4. Telephone _____
5. Fax _____
6. E-mail _____
7. Representative of the Proponent_____
8. Designation _____
9. Name of the person who conducted this assessment _____
10. Designation _____
11. Qualification_____

Project Information

12. Project Location_____
13. Cost of the Project_____
14. Area of the proposed land for the project

    Total _____ m^2

    Proposed covered _____ m^2

    Open space _____ m^2
15. Brief Project Description _____

    _____

    _____

Please attach a plot plan of the proposed project site showing the location of the key structures, access, utilities, units, etc.

16. List key equipment of the plant _____

    _____

_____

_____

17. Please describe the main chemicals that will be used during operations:

No	**Chemical**	**Expected Weekly Quantity**	**Purpose**

18. Design production capacity of the unit _____
19. Number and type of qualification of required staff to run the project? _____

_____

20. What will be the expected water requirement for the project?_____m^3/d
21. What is the proposed source of water? _____
22. Where the wastewater from the unit be disposed? _____
23. Please describe any treatment system for the wastewater planned? _____

_____

24. Please describe the solid waste expected during operations:

No	**Waste**	**Expected Weekly Quantity**	**Proposed Disposal** (Municipal Dump, Waste Contractor, Recycle, etc.)

25. What are the expected operating hours?_____
26. Is night shift planned? _____
27. How many vehicles carrying raw material and finished product are likely to enter or leave the unit daily? _____

Construction

28. Who owns the proposed land for the project? _____
29. What is the present use of the land? _____
30. Are there any squatter settlements on the land? _____

    If yes, please specify

Number of settlements _____

Will any compensation be paid to them? _____

31. Are there any structures on the proposed site now? ☐ Yes ☐ No

    If yes, will any structure be demolished? ☐ Yes ☐ No

    If yes, where the demolition waste will be disposed? _____

32. Are there any trees on the proposed site? ☐ Yes ☐ No

33. Will any tree be removed? ☐ Yes ☐ No

    If yes, how many? _____

34. Period of construction (start and end dates) _____

35. What major construction equipment (dozer, grader, crane, etc.) will be used?

    _____

36. Is construction work during the night planned? ☐ Yes ☐ No

Section II: Screening

Is the proposed project located in an ecologically sensitive area?:

☐ Yes ☐ No

If the answer to the above questions is yes, then the project would require an initial environmental examination or an environment impact assessment. Refer to the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations, 2000 for appropriate category.

Section III: Environmental Profile

1. Describe the terrain of the project area:
   - ☐ Flat or Level (Slope < 3%)
   - ☐ Level to moderately steep (Slope 3%-30%)
   - ☐ Moderately steep to mountainous (Slope > 30%)
2. Are there signs of soil erosion or landslide anywhere within 500 m of the proposed site?
   - ☐ Yes
   - ☐ No

   If yes, please describe (where, nature) _____

   _____

3. Is there any surface water body (river, canal, stream, lake, wetland) within 1,000 m of the proposed site?

☐ Yes

☐ No

If yes, describe each water body:

Name (including type, ie, river, canal or stream)	**Dimensions**	**Status and Uses** (Is it polluted? Is domestic or other wastewater discharged to it? What are its uses, eg, agriculture, domestic, industrial, washing, fishery

4. Is there any groundwater well on the proposed site or within 500 m of the proposed site?

☐ Yes

☐ No

If yes, describe each well:

Type (Dug well, tube well, hand pump)	**Location** (Village, road, mohalla, etc. and distance from the site)	**Depth and Yield**	**Uses** (Drinking, agriculture, domestic, industrial, washing, livestock)

5. Based on the interview of the surrounding population or a wildlife expert, is any form of wildlife found on, or around the proposed site of the project?

☐ Yes

☐ No

If yes, please describe _____

_____

6. Are there any existing trees or vegetation on the proposed site?

   ☐ Yes

   ☐ No

   If yes, how many? _____

7. Are there any reserved forest or protected area within 1,000 m of the proposed site?

   ☐ Yes

   ☐ No

   If yes, please describe?_____

8. Please provide the traffic count for all main roads adjacent to the proposed site or roads that will provide access to the site. The count should be based on data collected, for both directions, on at least three typical working days. Use the following format:

   Road_____ Count Location _____

	6:00 am-9:00 am	9:00 am-12:00 noon	12:00 noon-3:00 pm	3:00 pm-6:00 pm	6:00 pm-9:00 pm
Large vehicles (trucks, buses, tractor trolleys, Minibuses)					
Medium sized vehicles (Suzuki pickups, cars, jeeps, taxis)					
Small vehicles (Rickshaws, motorcycles, scooters)					
Slow vehicles (animal-driven carts, tongas)					
Others					

   (*Please add additional sheets for every road*)

9. What is the present land use in the vicinity (roughly a radius of 500 m) of the proposed site?

	Residential (Thick, Moderate, Sparse)	**Commercial** (Office, Shops, Fuel Stations)	**Open Land** (Parks, Farmlands, unutilized plots, barren land	**Industrial**	**Other**
Description					

(*Please attach a map of the proposed project site and indicate roughly the area that you have considered for this evaluation*)

10. For any agricultural farmland on the proposed site and a radius of 500 m around it, provide the following information:

    Main crop(s) and average yield _____

    Source of irrigation water_____

    Area affected by salinity or water logging _____

11. Please describe all the sensitive receptors within 500 m of the proposed site:

Type (schools, colleges, hospitals, and clinics)	**Name**	**Size** (Number of students or number of beds)	**Location** (Village, road, mohalla, etc.)	**Distance from Site**

12. Roughly, how many houses are within a radius of 500 m of the proposed site?

    _____

13. What is the total population of the area? _____

14. What proportion of the houses in the area are *pukka, semi-pukka, and* kutcha? _____

15. How are the general hygienic conditions of the project area?

    ☐ Generally clean

☐ Fair

☐ Poor

16. Is there any bad odor in the project area?

☐ Yes

☐ No

What is the source of the odor?_____

17. What are the main sources of income of the surrounding community?_____

_____

18. Is there any site of cultural importance (graveyard, shrine, mosque, archeological site) within 1,000 m of the proposed scheme?

☐ Yes

☐ No

If yes, please describe?_____

19. What other main sources of pollution exist within a radius of 500 m of the proposed site:

Name of the Source	**Type of Pollution** (Noise, air water)	**Location** (Village, road, mohalla, etc.)	**Distance from Site**

Section IV: Impact Assessment

Potential Negative Environmental Impacts	*Tick, if relevant*	*Mitigation Measures*	*Tick, if proposed*	*Monitoring*
Discharge of liquid effluent	☐	Good housekeeping	☐	
		Amount of chemicals used in dying and washing will be controlled	☐	
		Soap will be replaced with detergent	☐	
		Untreated liquid effluent will not be discharged into a river, stream or any water body	☐	
		Liquid effluent will be treated by screening and sedimentation	☐	
Dust and wool emissions	☐	Proper vantilation and use of dust masks	☐	
Smell	☐	Workers will be provided with nose coverings	☐	
		Proper ventilation	☐	
Solid waste	☐	Incinerator will be installed for solid waste burning	☐	
		Solid waste will be sold to outside contractors	☐	
		Solid wastes will be handed over to municipal authorities	☐	

Section V: Undertaking

I, _____ (*full name and address*) as proponent for _____ (*name, description and location of project*) do hereby solemnly affirm and declare:

1. The information on the proposed project and the environment provided in Forms I, II and III are correct to the best of my knowledge

2. I fully understand and accept the conditions contained in the Guidelines for _____
(*name, number and version of the guidelines*)

3. I undertake to design, construct and operate the project strictly in accordance with the project described in Form I, submitted with this undertaking.

4. I undertake to implement all mitigation measures and undertake monitoring stated in Form IV, submitted with this undertaking.

Date _____ Signature _____

Name _____

Designation _____

(with official stamp/seal)

Witnesses:

	Signature	Name	Address
1	_____	_____	_____
2	_____	_____	_____