



**GOVERNMENT OF PUNJAB
ENVIRONMENTAL PROTECTION AGENCY**



Environmental Assessment Checklists and Guidelines

Carpet Manufacturing Units

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1. Introduction

1.1 Background

The province of Punjab, 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.

1.2 Purpose of Guidelines

These guidelines have been prepared to assist project proponents, environmental consultants, and regulatory authorities in identifying, assessing, and managing the potential environmental impacts associated with the planning, design, construction, operation, and maintenance of bus terminal projects. The guidelines provide practical guidance for the preparation of Initial Environmental Examination (IEE) reports, implementation of appropriate mitigation measures, environmental monitoring, and preparation of Environmental Management Plans (EMPs). They are intended to facilitate compliance with the applicable environmental legislation, regulations, and standards in Punjab while promoting environmentally sustainable development of carpet manufacturing units.

1.3 Scope of the Guidelines

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

1.4 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 Environmental Protection Agency, Punjab for evaluation. EPA Punjab 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.

1.5 Glossary

Act: mean The Punjab Environmental Protection Act 1997 (Amended 2017).

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: Wastewater 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 Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022.

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

Sedimentation: means settling of particles by gravity.

1 Project Profile

2.1 Project Description

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

i. Carding

Carding is the process of combing and cleaning the wool. Since wool is the basic raw material for carpet making, it should be 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.

ii. 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.

iii. Dyeing

Dyeing wool can be quite a complicated process. It needs a lot of attention and experience to obtain wool of desired color. 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 colors 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 colors 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.

iv. 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 warp yarns firstly. Next two weft yarns are woven through the warp. 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.

v. 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 luster, and therefore, it is as important a step as coloring, 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.

3 Environmental Impacts

3.1 Carding

Carding is done by hand and also done using machines. During carding by hand no fiber is escaped and impacts are negligible. However, moderate measures required while using machines.

3.2 Spinning

Process of converting the wool fibers is drawn and twisted to make yarns of desired thickness is called spinning. Hand spinning is a traditional skill and generally wool is spun by hands and it involves no environmental impacts.

However, moderate measures required while using machines. These may include but not limited to

- Performing operation in closed air tight room
- Provision of personnel protecting equipment to workers.

3.3 Dyeing and Washing

During dyeing and washing processes liquid waste is generated. This wastewater has high Biochemical Oxygen Demand (BOD) and is colored in appearance. BOD and color are due to use of dyes, chemicals and soaps during the dyeing and washing processes. The wastewater generated from this process needs monitoring and treatment (primary and secondary treatment) to bring effluent quality within Punjab Environmental Quality Standards (PEQS).

3.4 Weaving

Dust and wool emissions (lint/fibers), generated during carpet weaving needs attention to avoid environmental and health issues. These may include but not limited to followings

- Collection of dust (lint / fibers at point of generation
- Provision masks to workers to avoid cause lung disease upon extended exposure.

3.5 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.

3.6 Solid waste

Carpet manufacturing unit can generate moderate quantity of solid waste. The sources may include but not limited to carpet manufacturing process and municipal solid wastes (kitchen and residential area).

- The unit must ensure provision of solid waste collection system comprising of collection, storage within factory premises and disposal at designated site of local government.
- Littering / dumping along roadsides or in vicinity of the unit be avoided.

4 Environmental Mitigation Measures

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

4.1 Carding

During carding by hand no fiber is escaped and impacts are negligible. However, moderate measures required while using machines. These may include but not limited to

- Performing operation in closed air tight room
- Provision of personnel protecting equipment to workers.

4.2 Spinning

Moderate measures required while using spinning through machines. These may include but not limited to

- Performing operation in closed air tight room
- Provision of personnel protecting equipment to workers.

4.3 Dyeing and Washing

i. Measures of Process wastewater may include the followings:

- Monitoring the quality of wastewater coming out of the unit.
- Segregation of waste streams
- Treatment (primary and secondary) of wastewater to bring effluent quality within the Punjab Environmental Quality Standards (PEQS).
- Good housekeeping
- Control of the amount of chemicals used in dying and washing
- Replacement of soap with detergent

ii. Measures for municipal wastewater

- Wastewater generated from offices, workers toilets and kitchen etc. be subjected to specially designed three compartment septic tanks before final disposal.
- Monitoring of the streams of municipal wastewater
- Ensure compliance of effluent quality as per the Punjab Environmental Quality Standards (PEQS).

4.4 Weaving

Dust and wool emissions (lint/fibers), generated during carpet weaving needs attention to avoid environmental and health issues. These may include but not limited to followings:

- Collection of dust (lint / fibers at point of generation)
- Provision masks to workers to avoid cause lung disease upon extended exposure.

4.5 Odor

Odor has negligible objectionable impacts, particularly when units installed in designated industrial area.

4.6 Solid waste

Measures to minimize the impacts of solid wastes include followings:

- The unit must ensure provision of solid waste collection system comprising of collection, storage within factory premises.
- In case of large quantities of solid wastes, unit may consider installation of incineration facility within its premises (optional).
- Handing over the Solid waste to government approved incineration facility.
- Handing over the solid waste to private contractors
- Handing over / disposal of solid wastes at designated site of local government.
- Littering / dumping along roadsides or in vicinity of the unit be avoided.

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 _____ m²
Proposed covered _____ m²
Open space _____ m²
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? _____m³/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 Punjab Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations, 2022 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 ventilation 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	_____	_____	_____

