

Proposed Expansion of Existing Sugar plant from 6000 TCD to 10000 TCD

At Dattatrayanagar, A/P Pargaon Via Awasari Bk. Taluka Ambegaon, District Pune, Maharashtra

Proposed by

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Executive Summary

1 Introduction

M/s. Bhimashankar Sahakari Sakhar Karkhana Limited (BSSKL), is a company registered under the Maharashtra Co-Operative Societies Act, 1960, with Registration No. PAN/AGN/PRG/(A) S-47/1994, dated 31/03/1994. The primary objective of BSSKL is to engage in the manufacturing of sugar, with an existing crushing capacity of 6,000 TCD, a cogeneration power plant of 29 MW, and a 95 KLPD molasses-based distillery. The industry now proposes to expand its sugar plant capacity from 6,000 TCD to 10,000 TCD, utilizing sugarcane as the primary raw material for sugar production.

Industry has obtained Environment clearance for existing 6000 TCD sugar from SEIAA, Maharashtra vide letter no. SEIAA-EC-0000000537 dated 27.11.2018 & 29 MW Cogeneration power plant from SEIAA, Maharashtra vide EC letter no EC22B004MH126409 dated 21.04.2022 and 95 KLPD Distillery plant from SEIAA, Maharashtra EC letter vide no EC22B022MH110015 dated on 07.09.2022. The industry is operational by obtaining consent to operate for 6000 TCD sugar & 29 MW cogeneration unit.

2 Project Location

The proposed project will be located at Gut No. 130/2, 131/1, 131/2, 146, 148, 149, 150/2, 151/1, 152/2, 153/2, 154, 155/2, 156, 157/1, 157/2, 158, 159, 160/1, 160/2, 161, 162, 165, 202, 203/1, 203/2, 204/2, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 219, 220, 221, 403/1 at Dattatrayanagar, A/P Pargaon via Awasari Bk., Taluka Ambegaon, District Pune, Maharashtra. Unit is geographically located at Latitude 18°58'32.68"N & Longitude 74°05'27.20"E situated around 617 m above MSL.

3 Salient features of integrated project

Table 1 Brief information of the project and environmental settings

#	Particulate	Description					
1	Project	Proposed expansion of exis	Proposed expansion of existing sugar plant capacity from 6000 to				
1.		10000 TCD.					
	Location	Gut No. 130/2, 131/1, 131/	Gut No. 130/2, 131/1, 131/2, 146, 148, 149, 150/2, 151/1, 152/2,				
		.53/2, 154, 155/2, 156, 157/1, 157/2, 158, 159, 160/1, 160/2, 161					
2		162, 165, 202, 203/1, 203/2, 204/2, 205, 206, 207, 208, 209, 210,					
Ζ.		211, 212, 213, 214, 215, 21	211, 212, 213, 214, 215, 219, 220, 221, 403/1 at Dattatrayanagar,				
		A/P Pargaon Tarfee Awasari Bk. Taluka Ambegaon, District Pune,					
		Maharashtra.					
3.	Land Available	58.00 Ha.					
4.	Project configuration	Sr. No.	Existing	Proposed	Total		

#	Particulate	Description					
			Sugarcane (TCD) 6000		4000	10000	
		#	Description		Area	i Ha.	
		1	1 Existing sugar area		8.7		
		2	Proposed sugar area		0.5		
		3	Distillery area		2.	.1	
_		4	Existing Greenbelt (33	8%)	19	0.1	
5.	Area	5	Proposed green belt		2	2	
		6	Parking		8.	.7	
		7	Internal Road		3.	.5	
		8	Open Area		13	3.4	
			Total Available Lar	nd	58	3.0	
		Pro	duct & By Product	Existing	Proposed	Total	
		Pro	duct				
		Sug	Sugar Cane Crushing		4000	10,000	
6.	Product & by	Bv	By products				
	Products	Molasses (MT/Day)		240	160	400	
		Bagasse (MT/Day)		1560	1040	2600	
		Press Mud (MT/Day)		240	160	400	
		Co	Co gen Power (MW) 29		0	29	
7.	Operational days	Sug	ar: 160 days				
8.	Water consumption	Exis	sting: Sugar & Cogen ur	nit: 309 CM	ID		
9.	Boiler	Exis	sting: 80 TPH*1; 45 TPI	H *2			
10		80	TPH*1- 72 m stack heig	ht with ESI	P as APCE		
10.	Stack		TPH*2-60 m common s F	stack neigh	t- with wet scr	ubber as	
11.	T.G Set	Exis	sting: 29 MW (13 MW +	- 16 MW)			
12.	Steam generation	Exis	sting: 170 TPH	Proposed	: 60 TPH		
	0	Exis	sting:	Proposed	1:		
10	Power	Ger	neration- 29 MW	Consump	nsumption- 13 MW		
13.	consumption	Cor	nsumption- 8 MW	Export- 16 MW			
		Exp	ort- 21 MW				
14.	D.G Set	Existing: DG 500 kVA					
		Exis	sting:	Proposed	1:		
15.	Fuel	Bagasse: 1150 TPD; Bagasse: 588 TPD;					
		HSE	D: 10 Ltr/Hr.	HSD: 10 L	ISD: 10 Ltr/Hr.		
		Sug	ar effluent will be treat	ed in exist	ing ETP of 1350	⊃ m³/day,	
16.	Effluent	capacity & condensate will be treated in existing Condensate					
		Poli	ishing unit of 1800 m³/o	day capacit	су.		
17.	Man power	Exis	Existing- 667 Nos.; Proposed- 44 Nos.				

#	Particulate	Description
		Total- 711 Nos.
18.	Total project cost	Existing- 82 Cr.; Proposed- 52 Cr.
19.	Total cost for EMP	Capital- 104.5 lakhs; O&M – 54 lakhs/A

4 Process description

Technology- Most of the sugar factories in India follow Double Sulphitation Process and produce plantation white sugar.

The major unit operations are given below. These are

- 1. Extraction of Juice
- 2. Clarification
- 3. Evaporation
- 4. Crystallization
- 5. Centrifugation

Extraction of Juice

The sugarcane is passed through preparatory devices like knives for cutting the stalks into fine chips before being subjected to crushing in a milling tandem comprising 4 to 5 three roller mills. Fine preparation with its impact on final extraction, is receiving special attention and shredders and particularly the fibrizers are gaining popularly. The mills are of modern design, being equipped with turbine drive, special feeding devices, efficient compound imbibition's system etc. In the best milling practice, more than 95% of the sugar in the cane goes into the juice, this percentage being called the sucrose extraction or more simply, the extraction.

A fibrous residue called Bagasse; with a low sucrose content is produced about 25 to 26% of cane, which contains 47 to 50% moisture.

Clarification

The dark-green juice from the mills is acidic (pH-5.5) and turbid, called raw juice or mixed juice. The mixed juice after being heated to 65 to 75 °C is treated with phosphoric acid, Sulphur dioxide and milk of lime for removal of impurities in suspension in a continuously working apparatus. The treated juice on boiling fed to continuous clarifier from which the clear juice is decanted while the settled impurities known as mud is sent to rotary drum vacuum filter for removal of unwanted stuff called filter cake is discarded or returned to the field as fertilizer. The clear juice goes to the evaporators without further treatment.

Evaporation

The clarified juice contains about 85% water. About 75% of this water is evaporated in vacuum multiple effects consisting of a succeeding (Generally four) of vacuum-boiling cells arranged in series so that each succeeding body has higher vacuum. The vapours from the final body go to condenser. The syrup leaves the last body continuously with about 60% solids and 40% water.

Crystallization

The syrup is again treated with Sulphur dioxide before being sent to the pan station for crystallization of sugar. Crystallization takes place in single-effect vacuum pans, where the syrup is evaporated until saturated with sugar. At this point 'seed grain' is added to serve as a nucleus for the sugar crystals, and more syrup is added as water evaporates. The growth of the crystals continues until the pan is full. Given a skilled sugar boiler (or adequate instrumentation) the original crystals can be grown without the formation of additional crystals, so that when the pan is just full, the crystals are all of desired size, and the crystals and syrup form a dense mass known as "massecuite". The "strike" is then discharged through a foot valve into a crystallizer.

Centrifugation

The massecuite from crystallizer is drawn into revolving machines called centrifuges. The perforated lining retains the sugar crystals, which may be washed with water, if desired. The mother liquor "molasses" passes through the lining because of the centrifugal force exerted and after the sugar is "purged" it is cut down leaving the centrifuge ready for another charge of massecuite. Continuous centrifuges may purge low grades. The mother liquor separated from commercial sugar is again sent to pan for boiling and re-crystallization. Three stages of re-crystallization are adopted to ensure maximum recovery of sugar in crystal form. The final mother liquor referred to as final molasses is sent out the factory as waste being unsuitable for recovery of sugar under commercial condition from economical point of view.

Process Flow Diagram & Mass Balance of the sugar manufacturing is given below:



Figure 4-1 Sugar Manufacturing Process Flow Chart

5 Description of the Environment

Standard ToR was approved by SEIAA, Maharahtra vide letter no. No. No. SIA/MH/IND2/515889/2024 dated 11.01.2025. The study period conducted was from 1st November 2024 to 31st January 2025. The guiding factors for the present baseline study are the requirements prescribed by the guidelines given in the EIA Manual of the MoEF&CC and methodologies mentioned in Technical EIA Guidelines Manual for Distilleries by IL&FS Ecosmart Ltd., approved by MoEF&CC.

Baseline study and all analytical work is carried out from a recognized lab, i.e. MITCON Consultancy & Engineering Services Ltd., which is a NABL & MoEF&CC recognized laboratory under the EPAct -1986. Toposheet of project site showing project location with various geographical features within 10km radius of the project site and satellite image are presented in below respectively.

	Table 2 Environmental Settings			
#	Particulars	Description		
1	Geographical	Latitude 18°58'32.68"N		
	Coordinates	Longitude 74° 5'27.20"E		
2	Average altitude above MSL	617 m		
3	Toposheet number	47 F/13, 47 I/4, 47J/1		
		Pargaon Shingave @ 0.50 km towards NNW direction		
4	Impact Habitation	Pargaon Tarfe Awasari BK. @ 1.16 Km towards WNW direction		
		Kathapur @1.96 Km towards NE direction		
	Nearest town	Pargaon Tarfe Awasari BK. @ 1.16 Km towards WNW		
5		direction		
		Manchar @ 14.76 Km towards WNW direction		
6	Nearest Railway Station/ Junction	Talegaon Railway Station @ 50.85 Km towards SW direction		
7	Nearest Airport	Pune International Airport @ 47.32 km towards SW		
8	Nearest IMD station	Pune IMD station @ 54.94 km towards SW direction		
0	Nearost Water body	Ghod River @ 0.22 km towards N direction		
9		Meena River @ 0.44 km towards N direction		
10	Nearest Road	PargaonShingave – Kavathe Road		
		Ashtavinyak highway passing through the site. Belhe – Jejuri		
11	Nearest Highway	Highway @ 5.99 Km towards SE direction		
		Belhe – Manchar Road @ 8.65 Km towards NW direction		

Environmental Settings within the Study Area

12	Religious/ Historical Place	Bhimashankar Temple @ 58.05 Km towards WNW direction
13	Any Archaeological monuments	Not any
14	Ecological sensitive area / Reserve Biosphere within 10 km / RF	No any ESZ/ESA in the 10 km radius of the project site. However, some reserve forest patches are present in 10 km radius. Nearest reserve forest Patch @ 1.81 km towards NE direction. Reserve forest @ 3.16 km towards SE direction. Reserve forest Patch @ 4.08 km towards NW direction. Reserve forest @ 7.00 km towards North direction.
15	Seismic Zone	Seismic Zone II
16	Temp.	Min 1.7 ^o C Max 43.3 ^o C
17	Average Annual rainfall	803 mm

Table 3 Observation of Environmental monitoring

Environmental Attributes	Frequency of monitoring	Parameters	Observed Results
Meteorology	Microprocessor based	Wind direction	West followed by West North West
	Weather Monitoring	Max. Temp.	43.3 °C
	Station	Mini. Temp.	1.7 °C
	Continuous hourly recording	Relative Humidity	47-74 %
		Precipitation	Annual avg. 789.7 mm
Ambient Air	12 Locations	PM ₁₀	PM₁₀: 55.27 to 80.15 μg/m ³
Quality	24 hourly samples Twice a week for 3	PM _{2.5}	PM_{2.5}: 22.92 to 39.30 μg/m ³
		SO ₂	SO ₂ : 7.11 to 15.36 μg/m ³
	months (in µg/m ³⁾	NOx	NO_x: 10.46 to 26.96 μg/m ³
		СО	CO : 0.10 to 0.50 mg/m ³
		O ₃	O ₃ : 10.40 to 23.38 μg/m ³
			All monitored parameter are well
			within the prescribed standards.
Water Quality	9 no. of locations -	Parameter	Ground Water:
(Ground &	Ground water	рН	The ground water pH ranges from
Surface*)	face*) 3 no. of locations – Surface water (Physical, chemical and biological parameters)	TDS	7.07 to 8.38. Total Dissolved Solid
		Hardness	(TDS) values were in the range of
			322 mg/lit to 486 mg/lit at all the

Environmental	Frequency of	Parameters	Observed Results
Attributes	monitoring		
			sampling locations. Total Hardness ranges from 134.11 mg/lit to 243 mg/lit. Chlorides ranges from 23.02 mg/lit to 70.78 mg/lit. Copper, Manganese, Zinc, Nickel and Hexavalent Chromium was below detectable limit at all the locations. Surface Water: • pH: 7.21 to 7.51 • DO: 4.9 mg/lit to 5.5 mg/lit
Soil Quality	Once in season at 9 locations	Soil type and texture, Physio- chemical properties, NPK	 pH: 7.68 to 8.13. Electrical Conductivity: 537.9 μs/cm to 865 μs/cm. Organic Carbon: 0.68% to 1%. Phosphorous: 19.3 kg/ha to 39.1 kg/ha. Potassium: 188.3 kg/ha to 243.5 kg/ha.
Noise Level	Once in season at 8	Day	47.2 – 65.1 dB(A)
	Locations (Noise levels in dB(A)	Night	38.2 – 47.2 dB(A)
Land use Pattern	One time visit of the study area	Identification & classification of land use	Most of the land is Agricultural land followed by Reserved forest.
Geology and hydrogeology	Based on secondary data	Geology and hydrogeology of the study area	 Rock types: Predominantly Deccan trap basalt; some patches show recent alluvium consisting mainly sand, gravel etc. Geological structures: Presence of minor faults and folds. Soil characteristics: Sandy loam soil with moderate permeability. Topographical features: Gentle slopes with occasional low hills and valleys.

Environmental	Frequency of	Parameters	Observed Results
Attributes	monitoring		
			 Geological hazards: Limited risk of landslides; signs of erosion along water channels observed. Groundwater availability: Moderate to good Groundwater quality: water samples are collected and tested in a laboratory the groundwater in the area is typically found to be suitable for drinking purposes. Surface water bodies: Ghod &
Feelen	Conoral in 10 lun radial	<u>Elana</u>	Nieena river observed.
Ecology	General in 10 km radial study area and data collected around the project site through field visits	Flora	During the floral study, total 122 floral species were recorded. Total 36 species of birds, 6 species of Mammals and 9 species of fishes were recorded during field visit
Socioeconomic Data	General in 10 km radial study area and data collected around the project site through field visits	Socio- economic characteristics of the affected area	 Rural infrastructure in villages like Pargaon Tarfee Ale may vary, with access to amenities such as roads, electricity, healthcare facilities, and educational institutions being significant factors impacting socio- economic development. Zilha Parishad Primary school, Art and commerce college was present within study area but for higher education opportunities might require commuting to nearby towns or cities. Healthcare facility are basic, with primary health centres or dispensaries serving the healthcare needs of the population. Access to specialized medical services will require travel to urban centres

Environmental Attributes	Frequency of monitoring	Parameters	Observed Results
			 In many areas, access to adequate sanitation facilities and services were limited, leading to health risks such as waterborne diseases

6 Anticipated Environmental Impacts

Table 3 Anticipated Impacts

Environmental Facets	Anticipated Impacts
Air Environment	Probable increase in concentration of air pollutants due to process,
	fugitive and utility emissions.
Water Environment	Generation of industrial & domestic wastewater.
Land Environment	Impacts on land due to improper disposal of hazardous/ solid waste.
Ecological Environment	Positive as greenbelt of appropriate width will be developed and
	maintained by the company in the area. No impacts are envisaged
	on aquatic flora & fauna as there will be zero effluent discharge
	outside the plant premises.
Social Environment	Overall development of the area in respect of the infrastructure
	development, educational growth, health facilities etc.
Economic Environment	Positive impacts on economy of the region and the country as the
	Alcohol will be exported and revenue generation.
Noise Environment	Minor increase in noise level within the project area.
Occupational Health &	Major health hazards are identified in worst case scenario.
Safety	

7 Environmental Monitoring Program

Table 4 Environmental monitoring schedule

Sr. No.	Particulate	Parameters	Method of sampling/monitoring	Number of locations	Frequency
1.	Ambient air quality	PM ₁₀ , PM _{2.5} , SO ₂ , NOx, VOC	24 hours continuously (As per NAAQS)	Ambient air quality at minimum 3 locations. Two samples downwind direction at 500m and 1000m respectively. One sample upwind direction at 500m. (CPCB/MPCB guidelines)	Monthly

2.	Stack gas	PM, SO2 and NOx	Online stack monitoring is installed for existing system	3 Number of stacks	Monthly
3.	Work place	PM _{2.5} , SO ₂ , NOx, CO2, O ₃	IS 5182 (as per factory act) (STEL &TWA)	Process emission in workplace area/plants (for each area/plant minimum 2 locations and 1 location outside plant area near vent)	Monthly
4.	Waste water	pH, EC, TDS, O&G, SS, COD, BOD, Chloride etc.	H, EC, TDS, &G, SS, OD, BOD, hloride cc. s per BIS: D500	Wastewater from all sources. Inlet & outlet of ETP, spent wash, Condensate treatment plant	Monthly
		As per BIS: 10500		Online Monitoring machine is already installed at existing ETP.	Daily
5.	Surface water and ground water	pH, EC, TDS, SS, COD, BOD, Chloride, E coli etc.	Grab sampling As per BIS: 10500	3 location Ground water and 1 location Surface water	Half yearly
6.	Solid waste	pH, EC, metal, NPK	Grab and Composite sample	Process dust generated sludge and ash. Before used as manure if used manure	Half yearly
7.	Soil	N, P, K, moisture, EC, heavy metals etc.	As per BIS standards	At lands utilizing compost manure and treated effluent, 3 locations	Half yearly
8.	Noise	Noise levels	IS: 4954-1968 as adopted by CPCB	Three location (Day & Night). At all sources and outside the Plant area.	Monthly
9.	Green belt	Survival rate of plants and shrubs	Observation	In and around the plant site	Monthly

10.	Occupation al health	Health and fitness check-up of employees	-	All worker	Yearly/ twice a year
11.	Emergency preparedn ess	Fire and Safety	-	Mock drill records	Monthly

8 Additional Studies

The following additional such as risk assessment for storage and handling of alcohol and mitigation measure due to fire and explosion and handling area has been carried out.

9 Environmental Management Plan

Following mitigation measures shall be adopted by factory to minimize the impact of project on the surrounding environment.

Mitigation Measures		
Process Emission		
Wet scrubber & ESPs shall be provided for PM emissions.		
The whole process will be carried out in closed condition so as to avoid		
any chances of VOC emissions.		
Utility Emission		
• All the D.G. sets shall be standby arrangement and will only be used		
during power failure.		
• Adequate stack height shall be provided to Boiler and D.G. sets.		
• Electrostatic Precipitator shall be provided as an air pollution control		
device to the boiler with approximately 99.99 % efficiency to capture		
maximum boiler fly ash.		
Fugitive Emission		
• The main raw material and product shall be brought in and dispatched		
by road in covered enclosures.		
• Dust suppression on haul roads shall be done at regular intervals.		
• The Industry would be based on 'Zero Liquid Discharge' technology.		
• Effluent from sugar unit will be treated in 1350 CMD ETP. ETP		
Treated effluent from sugar will be reused in greenbelt		
development and cooling tower.		

 Table 5: EMP for various environmental attributes

	 Excess condensate of 1760 CMD form sugar will be treated in 1800 CMD CPU of sugar and treated water shall be recycled in equipment cleaning, distillery & sugar cooling, gardening. Domestic sewage will be treated in 90 CMD STP and treated water will be recycled into gardening Proper storm water drainage will be provided during rainy season to avoid mixing of storm water with effluent.
Noise Management	 Closed room shall be provided for all the utilities so as to attenuate the noise pollution.
	 Acoustic enclosure shall be provided to D.G sets.
	 Free flow of traffic movement shall be maintained. Earmuffs shall be
	used while running equipment's of the plant.
	• Proper maintenance, oiling and greasing of machines at regular
	intervals shall be done to reduce generation of noise.
	• Greenbelt shall be developed around the periphery of the plant to
	reduce noise levels.
Odour Management	Odour shall be primarily controlled at source by good operational
	practices, including physical and management control measures.
	 Better housekeeping will maintain good hygiene condition by regular steaming of all fermentation equipment.
	Use of efficient biocides to control bacterial contamination.
	• Control of temperature during fermentation to avoid in-activation/ killing of yeast.
	Avoid staling of fermented wash.
Solid & Hazardous	• The hazardous waste i.e. spent oil generated shall be very minor and
Waste	shall be burnt in boiler along with fuel.
Management	Bagasse ash will be mixed with press mud and utilized as a manure or
	sold directly to farmers.
	ETP, CPU & STP sludge can be used in greenbelt development
Traffic Management	Culverts shall be maintained.
	• The trucks carrying raw material & fuel shall be covered to reduce any
	Tugitive dust generation.
	Good traffic management system shall be developed and implemented for the incoming and outgoing upbickers as to succide a
	for the incoming and outgoing vehicles so as to avoid congestion on
	the public road.

Green Belt	 Plantation shall be done as per Central Pollution Control Board (CPCB)
Development /	Norms. The plantation in and around the plant site helps/will help to attenuate
Plantation	the pollution level. Native species shall be given priority for Avenue plantation. An amount of INR 0.39 Cr. (As CER OM dated 1.05.2018 Brownfield
Corporate	project 0.75% of total project cost) will be allocated for CSR activities
Environment	in the coming 2 years which will be utilized on the basis of requirement
Responsibility	for weaker sections of the society for next 2 years.
Occupational Health & Safety	 Factory shall monitor the health of its worker before placement and periodically examine during the employment Health effects of various activities and health hazard if any observed shall be recorded and discussed with the health experts for corrective and preventive actions need to be taken by the industry All safety gear shall be provided to workers and care shall be taken by EMC that these are used properly by them. All safety norms shall be followed

10 Environment Management Cost

Table 6 Environment Management Cost

S. No	Construction phase (with Break-up)	Capital Cost	0 & M
		(Amount in lakhs)	
1.	Environmental monitoring	0	1.5
2.	During site preparation	1	0
3.	Noise and solid waste management	1.5	1.5
4.	Water and waste water	5	3
5.	Occupational health	2	2
6.	Greenbelt development	5	2
	Total (A)	14.5	10
#	Operation Phase (with Break-up)	Capital Cost	0 & M
		(Amount in lakhs)	
1	Air pollution		
а	Wet Scrubber	0	10
b	ESP	0	
с	Online Continuous Emission Monitoring System	0	
	(OCEMS)		
d	ID fan and other auxiliaries	0	

2	Water pollution		
а	ETP	0	5
b	CPU	0	
С	STP	10	5
3	Noise pollution	3	2
4	Environmental Monitoring (Air, water, waste water,	0	5
	Soil, Solid waste, Noise)		
5	Occupation health	5	3
6	Green belt	30	10
7	Solid waste	3	2
8	Rain water harvesting	0	2
9	CER Cost	39	0
	Total (B)	90	44
	Total A+B	104.5	54

11 Project Benefits

- 1. Provides an initiative to sugar mill to concentrate more on conservation of energy & reduction of operating cost, thereby improving their profitability of operation.
- 2. Saves the expenditure on safe storage and disposal of bagasse.
- 3. Benefits of quick return on biomass power capital investment and generation of additional revenue.
- 4. The economic benefits available to the sugar factories from sale of exportable surplus and improvement in the operations
- 5. Entire integrated project is proposed to be set up based on the stand-alone commercial viability of each component of the project.

12 Conclusion

- Zero liquid discharged is proposed with efficient mitigation measures implemented.
- Air emissions through stack will be controlled by ESP.
- Loss of vegetation and habitat will not be attributed.
 - Personal protective equipment's, safety precautions, emergency plan & disaster management plan shall be in place to avoid the environment hazards.