BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH AT NEW DELHI ORIGINAL APPLICATION NO. 362 OF 2022

IN THE MATTER OF:

Aravalli Bachao Citizens Movement

...Applicant

Versus

Union of India & Ors.

...Respondents

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REPLYOF THE APPLICANT ORGANISATION TO THE JOINT COMMITTEE REPORT DATED 07.10.2022 AND AFFIDAVIT OF DIRECTOR, MINES AND GEOLOGY DEPARTMENT DATED 08.10.2022

MOST RESPECTFULLY SHOWETH:

- That the present Application was filed under Section 14 and Section 15 of the National Green Tribunal Act, 2010 highlighting ongoing illegal sand and stone mining taking place in the Aravalli range in the districts of Faridabad, Gurugram and Nuh in the State of Haryana. This mining is taking place in violation of the Order of the Hon'ble Supreme Court in M. C. Mehta v. Union of India [(2009) 6 SCC 142], Notification dated 07.05.1992 of Ministry of Environment, Forest & Climate Change (MoEF&CC), Environmental Impact Assessment Notification, 2006, Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, Punjab Land Preservation Act, 1900 and provisions of the Forest Conservation Act, 1980 and the verdict of Hon'ble Supreme Court in T.N. Godavarman Tirumalpad Vs Union of India [W.P No. 202 of 1996].
- That vide Order dated 23.05.2022, this Hon'ble Tribunal had directed for constitution of a Joint Committee to submit a factual verification report. The Hon'ble Tribunal had directed:

"7. In view of the allegations of illegal mining in 16 locations, it would be appropriate to seek factual verification report. Accordingly, we constitute a Joint Committee of representatives of MOEF & CC, CPCB, State PCB, Principal Chief Conservator of Forest (HoFFF), Director, Mining & Geology, Director General of Police and Commissioner, Gurugram Division, Government of Haryana and direct the Joint Committee to meet within four weeks and undertake site visits including visits to all 16 locations for ascertaining whether any illegal mining has been done in the area; whether such mining has been done before or after prohibition orders; what is the quantum of such mining and magnitude of the loss caused to the environment as well as the state exchequer. The State PCB will be the Nodal agency for coordination and compliance. Report may be furnished within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF."

3. That the Hon'ble Tribunal had also directed for the Director General of Police and Director, Mining & Geology, Government of Haryana to submit affidavits providing information on the following:

> "(a) How many complaints were received on web portal or by post or otherwise regarding illegal mining in the area during last 5 years; (b) What action was taken on such complaints, in how many cases FIRs were registered, in how many cases challans (chargesheets) under Section 173 (2) of the Code of Criminal Procedure, 1973/complaints under Section 22 of the Mines and Mineral (Development and Regulation) Act, 1957 were filed and in how many cases complaints were closed/no action was taken;

> (c) In how many cases vehicles were impounded and in how many cases the vehicles were confiscated or released after payment of the amount in accordance with orders dated 05.09.2018 and 26.02.2021 passed by this Tribunal in O.A No. 44/2016 titled as Mushtakeem v. MoEF&CC& Ors, and O.A No. 360/2015 titled as National Green Tribunal Bar Association vs. Virender Singh (State of Gujarat) respectively;

> (d) In how many cases proceedings for recovery of penalty and environmental compensation were initiated; and (e) What steps were taken for environmental restoration in the areas of illegal mining."

4. That the Joint Committee Report and the Affidavit on behalf of Director General of Police, Haryana were submitted on 07.01.2022 and the Affidavit by Director, Mining and Geology Department was submitted on 08.10.2022. These Reports were considered by the Hon'ble Tribunal on 10.10.2022 and same was recorded in the Order as well. The Hon'ble Tribunal had noted that the Affidavits by DGP, Haryana and Director, Mining and Geology Department as well as the Joint Committee Report had deficiencies and directed them to file further reports. The Hon'ble Tribunal held:

"16. In view of the above referred deficiencies, we are constrained to direct the DGP, Haryana and Director, Mining and Geology to file detailed reports giving information by way of statements in the tabular form as to the aspects mentioned below:-

(a) Statement regarding all complaints received by the Police
(i) date of receipt of complaint, (ii) name of the complainant,
(iii) particulars of FIRs registered, (iv) final report filed and (v)
order passed by the Court;

(b) Statement regarding complaints received by the Police from the Mining Department (i) date of receipt of complaint, (ii) action taken on complaint by the Police and (iii) information given to the Mining Department.

(c) Statement regarding complaints received by the Mining Department from the Police (i) date of receipt of complaint, (ii) action taken on complaint by the Mining Department and (iii) information given to the Police.

...

19. This Tribunal, vide order dated 23.05.202, had directed the Joint Committee, constituted vide order dated 23.05.2022, to undertake site visits including visits to all 16 locations for ascertaining whether any illegal mining has been done in the area; whether such mining has been done before or after prohibition orders, what is the quantum of such mining magnitude of the loss caused to the environment as well as the state exchequer. The Joint Committee undertook the field visits to all the 16 sites listed in the original application and has prepared the report accordingly. In view of the number of complaints received by the Police and Mining Department regarding illegal mining, we find that the same is spread over to the wider area and on diverse locations which aspect needs to be further explored/looked into by the Joint Committee. Besides, the aspects of closure of the mining pits and reclamation/rehabilitation of the land involved are also required to be considered by the Joint Committee. **Therefore**, **the Joint Committee is directed to look into these aspects, verify the factual position on the basis of the complaints received, take/recommend taking of appropriate remedial action and submit its report within four weeks by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR supported PDF and not in the form of Image PDF.**"

(Emphasis supplied)

5. That vide the same Order, the Hon'ble Tribunal also directed the PCCF (HoFF), Government of Haryana and Member Secretary, State Pollution Control Board to file reports as well. The Hon'ble Tribunal held:

"17. The PCCF (HoFF), Government of Haryana and Member Secretary, State PCB are also directed to file reports giving information regarding complaints in respect of illegal mining received by them and action taken on the same by way of statements in tabular form with reference to the aspects of (i) date of receipt of complaint, (ii) action taken on the complaint, and (iii) information given to the Police/Mining Department."

- That, however, no reports have been received by the Applicant till the filing of this Reply by the Applicant. The Applicant is filing this Reply to the Joint Committee Report dated 07.10.2022 and Affidavit dated 08.10.2022 of Director, Mining and Geology Department.
- 7. Following paras contain the response on behalf of the Applicant to the observations of the Joint Committee:

the Joint Committee on site visit to 16 locations

<u>S.</u> <u>No</u>	Location of Site	Signs of mining on the date of	<u>Remarks of</u> <u>Joint</u> <u>Committee</u>	<u>Response of the Applicant</u> <u>Organization</u>
		<u>field visit</u> <u>by Joint</u> <u>Committee</u>		
1.	Pandala Hills near Gairatpur Bas Village (in front of Rathee Cafe)	No fresh signs found of the mining	Illegal Mining in violation of Prohibitory order	No steps for ecological restoration of the severely degraded area have been taken.
2.	Pandala Hills near Gairatpur Bas Village (behind Rathee Café & Jungle Cafe)	Some tractor tracks were noticed	Illegal Mining in violation of Prohibitory order	Evidence of fresh illegal mining found on a site visit conducted near Rathee Café by the Applicant organisation on 25.11.2022 (Lat.: 28.343666, Long.: 77.00292). The illegal mining appeared to have been undertaken in the last few days on a hill side near the road. Copy of the photograph taken by the Applicant during the site visit on 25.11.2022 is annexed herewith as Annexure A-1.
3.	Aravalli area near Tikli Village (Ansal Retreat area)	Some tractor tracks were noticed	Illegal Mining in violation of Prohibitory order	On 06.11.2022, team of the Applicant Organisation saw illegal mining taking place in many spots in the vicinity (about 3 to 4 km away) from the Aravali Pathways school in Ansal Retreat area near Tikli village ((a)Lat: 28.30511, Long: 77.001166 (b) Lat: 28.301066 Long: 77.002306 (c) Lat: 28.301378 Long: 77.003105) It was too risky to photograph the people indulging in the illegal mining activity. One photograph taken as a grab from a video shows 'X' marked in white on one hill. Copy of the photographs of different locations showing illegal mining are annexed herewith as Annexure A- 2 .
4.	Aravalli near Jalalpur Sohna	Signs of excavation with heavy machinery and	Illegal Mining in violation of	Members of the Applicant Organisation visited the site (near Kharak village) on 17.09.2022 and 22.11.2022.

<u>S.</u>	Location	<u>Signs of</u>	Remarks of	Response of the Applicant
No	<u>of Site</u>	<u>mining on</u>	<u>Joint</u>	Organization
		the date of	Committee	
		field visit		
		by Joint		
		Committee		
	Village	tractor tracks	Prohibitory	
	close to ITC	were noticed	order	On 17.09.2022,
	Grand			Site visit was conducted near Kharak
	Bharat			village behind ITC Grand Bharat hotel
	hotel			in Manesar. The illegal mining activity
	(location			was going on at 7:45 am in the
	1& 2 in the			morning when the images and video
	same area)			were taken. The illegal miners
	Sume area)			uploaded 2 tractor loads of illegally
				mined stone If the photograph
				provided as evidence is zoomed in
				tractor can be seen next to the hill
				loading the stuff. When the neonle
				indulging in illegal mining realised
				that they have been photographed.
				they snatched the mobile phone of
				the Applicant Organization team
				member and deleted the photos and
				video of their activities from his
				phone. The team member had sent
				the 2 photographs and the video to
				other team members on WhatsApp
				before his phone was snatched by
				the people indulging in illegal mining.
				A newspaper also reported regarding
				the raid conducted by the Police and
				Mining Department in the area which
				clearly shows continuation of illegal
				mining in the area.
				Complaint email dated 17.09.2022
				was sent to the government
				authorities regarding the illegal
				mining activities near Kharak village.
				Copy of the complaint email dated
				17.09.2022, photographs taken by
				the team members and copy of the
				newspaper article reporting the raid
				conducted by the Police and Mining
				Department are annexed herewith as
				ANNEXURE A-3 (colly).
				On 22.11.2022, the team members
				of the Applicant Organisation visited
				the same location on 22.11.2022 to
				check the status and found illegal
				mining continuing in the area.

<u>S.</u>	Location	Signs of	Remarks of	Response of the Applicant
No	<u>of Site</u>	<u>mining on</u>	<u>Joint</u>	<u>Organization</u>
		<u>the date of</u>	<u>Committee</u>	
		<u>field visit</u>		
		<u>by Joint</u>		
		<u>Committee</u>		
				They hiked in this Aravalli area
				behind ITC Grand Bharat hotel for 2
				hours. When they were
				photographing the first hill with the X
				sign marked in white, a local man on
				a motorbike saw them. After a 15-
				whore many hills were marked with
				v kharak village 2x written in white
				and red on the hills everywhere
				After taking photographs, when the
				team was heading out of the forest,
				they heard blasting sounds in the
				vicinity.
				When the team members came out
				of the forest, a local man on the
				motorbike questioned them as to
				why they were filming the hills
				marked with X signs. The team
				members told the motor biker that
				ovploring different Arayalli areas. The
				motor biker then told them that be
				thought they were officials from the
				mining department and so had
				messaged the people working on
				breaking the hills to leave the area
				where all the X signs were marked.
				Photographs taken by the Applicant
				organization from the site visit on
				22.11.2022 are annexed herewith as
				ANNEXURE A-4.
5.	Aravalli	Yes	Extraction of	During a site visit conducted in
	near Kota		ordinary clay	March 2022 by the Applicant
			required	viganization, niegal stone mining
	Manesar		necessary	locations in this area. Conv. of the
	Police Lines		permission	photographs from the site visit from
	Complex		(STP) from	March 2022 are annexed herewith
			the Minina	as ANNEXURE A-5.
			Department	-
6.	Sand	No	A STP was	No permission can be granted as per
	mining		granted vide	the Order dated 08.05.2009 of the
	location 1		Permit No.	Hon'ble Supreme Court in M.C.
	near		3844 dt.	Mehta v. Union of India reported
	Manesar		01.02.2022	in (2009) 6 SCC 142.
			to	

<u>S.</u>	Location	<u>Signs of</u>	<u>Remarks of</u>	Response of the Applicant
<u>No</u>	<u>of Site</u>	<u>mining on</u>	<u>Joint</u>	Organization
		the date of	<u>Committee</u>	
		<u>field visit</u>		
		<u>by Joint</u>		
		<u>Committee</u>		
	Police Lines		15.03.2022	
	Complex		in Private	
			Land of	
			village Bar	
			Gujjar Tensil	
			Manesar,	
			GGN alter	
			the revelty of	
			$P_{c} = 20150/_{-}$	
7	Sand mining	Thoro woro	Ord oarth	No stops for ocological rostoration of
/.	location 2	some signs of	has heen	the severely degraded area have
	near	lifting of sand/	extracted	heen taken
	Manesar	earth	without	
	Police Lines		necessary	
	Complex		permission	
			(STP) from	
			the Mining	
			Department	
8.	Sand mining	No	A STP was	No permission can be granted as per
	location3		granted vide	the Order dated 08.05.2009 of the
	ahead of		Permit No.	Hon'ble Supreme Court in M.C.
	Manesar		3957 dt.	Mehta v. Union of India reported
	Police Lines		17.03.2022	in (2009) 6 SCC 142.
	Complex on		to	
	the same		15.04.2022	
	side of		in Private	
	Tauru road		Land of	
			village Bar	
			Gujjar Tehsil	
			Manesar,	
			GGN after	
			aeposit of	
			the royalty of	
0	Aravalli billa	No	KS. 13/03/	No stops for applaciant restaration of
9.		UVI		the severely degraded area baye
			Prohibitory	heen taken
	Station		order	
	Tauru block			
10.	Aravalli hills		Extraction of	It is incorrect on the part of the
	near Bissar		ordinary clav	Committee to term illegal stone
	Akbarpur		without	mining as extraction of ordinary clay.
	Vill. Tauru		required	On the site visit conducted by the
	block		necessary	Applicant team in February 2022, it
			permission	was clear that illegal stone mining is
			(STP) from	taking place.

S.	Location	Signs of	Remarks of	Response of the Applicant
No	of Site	mining on	Joint	Organization
		the date of	Committee	
		field visit		
		by loint		
		Committee		
		committee	the Mining	Photographs taken by the Applicant
			Department	toom during the site visit conducted
			Department	in Following the site visit conducted
				In February 2022 are annexed
	A 11: 1 -11		TH 1.841 1	nerewith as Annexure A-6.
11	Aravalli nilis	Yes		The Villager from Palla who had
	near Palla		In violation of	snown the Applicant organisation's
	Village in		Prohibitory	team members, the sites of illegal
	Nuh Block (2		order	stone and sand mining in December
	locations)			2021 informed on 23.11.2022 that
				illegal mining has not stopped in Palla
	(a) Illegal			village. 2 tractor loads of illegally
	stone			mined stone and sand are taken to
	mining in			sell in the market everyday.
	Palla village			
11	(b) Illegal	Yes	Ord, earth	No permission can be granted as per
(h)	sand mining	100	has been	the Order dated 08.05.2009 of the
(5)	in Palla		extracted	Hon'hle Supreme Court in $M.C.$
	village		without	Mehta v. Union of India reported
	vinage		necessary	in (2009) 6 SCC 142
			nermission	
			(STP) from	
			(STF) ITOIN the Mining	
			Dopartmont	
12	Arovalli billa	No	Department Sand/ Ord	No permission can be granted as per
12		NO	Sanu/ Oru.	the Order deted 08 05 2000 of the
	near Meoli		earth nas	the Order dated 08.05.2009 of the
	village in		been litted	Hon ble Supreme Court in M.C.
	NUN DIOCK		without	Menta v. Union of India reported
			necessary	in (2009) 6 SCC 142.
			permission	
			(STP) from	
			the Mining	
			Department.	
			It is case of	
			extension of	
			tield. Field	
			has been	
			extended by	
			removal of	
			ord. clay/	
			malba	
13	Aravalli hills	No	Illegal Mining	No steps for ecological restoration of
	near Hirwari		in violation of	the severely degraded area have
	Bamatheri		Prohibitory	been taken.
	village in		order	

<u>S.</u>	Location	Signs of	Remarks of	Response of the Applicant
No	<u>of Site</u>	<u>mining on</u>	<u>Joint</u>	Organization
		the date of	<u>Committee</u>	
		<u>field visit</u>		
		<u>by Joint</u>		
		<u>Committee</u>		
	Ferozepur			
	Jhirka block			
14	Aravalli hills	No	Illegal Mining	No steps for ecological restoration of
	near		in violation of	the severely degraded area have
	Bhagola		Prohibitory	been taken.
	village in		order	
	Ferozepur			
	Jhirka block			
15	Aravalli near	No	No Illegal	In a site visit conducted in March
	Bharadwaj		Mining in	2021, the Applicant team noticed
	lake area		violation of	sand being transported on camel and
			Prohibitory	the hills in the area had been broken.
			order	Photographs from the site visit
				conducted in March 2021 are
				annexed herewith as ANNEXURE A-
				7.
16	Aravalli near	No	Mining lease	In a site visit conducted in April 2021,
	Kot village in		was	the Applicant team saw tractors
	Dhauj area		operational	without number plates transporting
			in this area	illegally mined sand and stone.
			between	Videos of the same have been
			06.02.2002	annexed with the Original Application
			to	as Annexure A-3.
			05.02.2009.	During another site visit conducted in
				June 2021 along with the police
				official of Sohna Sadar Police Station,
				the police official admitted to illegal
				sand mining happening, however,
				stated that it does not fall under their

8. New location of illegal sand mining documented in the Gurugram

jurisdiction.

Aravallis: The applicant organization heard about illegal sand mining taking place in the Aravalli forest area next to Baliawas village. On 27.11.2022 evening, Aravalli Bachao Citizens Movement team visited this area. As they approached the forest area at the end of the village road, they crossed 2 tractors carrying sand out of the forest. Both the tractors had no number plates. The team followed the tractor marks on the kuccha road into the forest and came across a big hillock of sand from where the tractors must have picked up the sand. Location coordinates: Latitude 28.425655 and Longitude 77.12207. As the team walked a little further, they heard voices of many men and some work going on. It was getting

dark and so the team decided to head back. After a few minutes, a JCB came from the behind them. This was the number of the JCB: HR30 R 6002.

Photographs from the site visit conducted on 27.11.2022 along with Google images of the Aravalli forest area near Baliawas village showing illegal sand mining spots are annexed herewith as **ANNEXURE A–8**.

Response of the Applicant on Short Term Permits (STOs) being issued by the Haryana Mining Department

- 9. That the Joint Committee in its Report has stated that extraction of ordinary clay is regulated and Short Term Permits (STPs) have been issued by the Mining Department in accordance with the guidelines issued by the Director, Mines and Geology vide memo no. GLG/HY/Ord/ Clay/ STP dated 09.01.2007 for extraction of ordinary clay and extraction of clay without STPs is illegal. The Report states sand mining being undertaking in sand mining location- 1 near Manesar Police Line Complex, sand mining location-3 ahead of Manesar Police Lines Complex on the same side of Tauru Road are legal as STP has been granted for extraction of ordinary clay is being undertaken without required necessary permission (STP) from the Mining Department. These areas are:
 - i. Near Kota Khandelwa Village near Manesar Police Lines Complex
 - ii. Location-2 near Manesar Police Lines Complex
 - iii. Bissar Akbarpur Village, Tauru Block
 - iv. Location-2 near Palla Village in Nuh Block
 - v. Near Meoli Village in Nuh Block
- 10. That the Hon'ble Supreme Court in its Order dated 08.05.2009 in *M.C. Mehta v. Union of India* reported in (2009) 6 SCC 142 has explicitly suspended *al*/mining operations in Aravalli hill range in the State of haryana in the districts of Faridabad and Gurgaon including Mewat (Nuh). The Hon'ble Supreme Court in this Order has not granted any exception to extraction of ordinary clay by permission granted through Short Term Permits. All sorts of mining activities have been suspended.
- 11. That therefore, the granting of STPs by the Mining Department vide memo no. GLG/HY/Ord/ Clay/ STP dated 09.01.2007 is in violation of the Order of the Hon'ble Supreme Court.

12. That this Hon'ble Tribunal has also noted in its Order dated 10.10.2022 that such STPs are illegal and in violation of the Order dated 08.05.2009 in *M.C. Mehta v. Union of India* reported in (2009) 6 SCC 142. Relevant part is reproduced below for reference:

"20. In the report of the Joint Committee, it has also been mentioned that permits were issued by the concerned authority for lifting of ordinary earth from two locations but the procedure adopted for issuance of said permits by the concerned authority and the reasons justifying the same have not been mentioned. It is not disputed that under the orders of Hon'ble Supreme Court there is complete prohibition of mining of major minerals in the Aravalli Hills area. There is no reference to any order of Hon'ble Supreme Court permitting mining of minor minerals in the area. We are of the view that excavation of ordinary earth also amounts to mining requiring environmental clearance and no permits for lifting of ordinary earth can be issued without such environmental clearance and Mining Plan. It has also to be borne in mind that such orders granting special temporary permits may be misused by unscrupulous persons as cover to camouflaged illegal mining in the area and remedial action based on precautionary principle is required to be taken.

24. In view of precautionary principle and subject to orders of Hon'ble Supreme Court, it is directed that no STP be issued for mining of ordinary earth/clay in the Aravalli Hills in Faridabad, Gurugram and Nuh till further orders to the contrary."

(Emphasis supplied)

13. That the Hon'ble Tribunal has already noted that such STPs are illegal and Therefore, Cannot Be Granted.

...

<u>Response of the Applicant to the observations made by the Joint</u> <u>Committee that magnitude of environment loss for the</u> <u>degradation caused could not be assessed due to non-existence of</u> <u>standard formulae or practice</u>

14. That the Joint Committee has stated in the Report that the Committee noticed instances of mining activity despite there being prohibition orders in place and the Committee also observed that at some sites trenches were formed due to excavating the material and at some sites, shavings of bushes and plantations were also noticed. However, the magnitude of

environment loss for the degradation caused could not be assessed due to non-existence of standard formulae or practice.

- 15. That the Mining and Geology Department of Haryana was a member of the Joint Committee constituted by the Hon'ble Tribunal as per the Order dated 23.05.2022. The Mining and Geology Department has also submitted a separate Affidavit dated 08.10.2022 where the amount of environment compensation recovered from illegal mining (Rs. 24,74,37,329/-) was mentioned. However, in the Joint Committee Report, it is stated that the Committee noticed instances of mining activity despite there being prohibition orders in place and the Committee also observed that at some sites trenches were formed due to excavating the material and at some sites, shavings of bushes and plantations were also noticed. However, the magnitude of environment loss for the degradation caused could not be assessed due to non-existence of standard formulae or practice. This statement made in the Report (of which the Mining and Geology Department is a member) is contradictory to the statement made in the Affidavit by the Mining and Geology Department dated 08.10.2022 wherein the environmental compensation of Rs. 24,74,37,329/- has been recovered.
- 16. That it is submitted that a method of computation of scale of compensation to deal with cases of illegal sand mining has already been prepared by the Joint Committee formed by this Hon'ble Tribunal in OA No. 360 of 2015 (National Green Tribunal Bar Association v. Virender Singh) and a Report dated 29.01.2020 regarding the same was submitted before this Hon'ble Tribunal. The Hon'ble Tribunal has also recorded and approved the computation method proposed by the Joint Committee in Orders dated 17.08.2020 and 26.02.2021 of OA No. 360 of 2015.
- 17. That the Joint Committee in its Report dated 29.01.2020 has proposed two approaches towards computation of compensation in cases of illegal sand mining. The first approach is computation of direct compensation based on the market value of extraction, adjusted for ecological damages. The Report states that the compensation is based on three distinct criteria i.e. exceedance factor (the extent of illegal mining that has taken place), risk factor (severity of ecological damages at the field site in question) and deterrence factor (takes into account the cumulative impact over time). The second approach is to compute a simplified Net Present Value (NPV) that implies that the total benefits from the activity of sand mining (represented

by the market value of the extracted amount) to be deducted from the total ecological costs.

18. That a detailed discussion on the two approaches was recorded in Orders dated 17.08.2020 and 26.02.2021 and the Hon'ble Tribunal was pleased to approve Approach No. 2 (Computation of a simplified Net Present Value) in the following manner:

"Scale of compensation for violations on polluter pays principle

10. Vide order dated 17.08.2020, the Tribunal considered the CPCB report dated 30.01.2020, in pursuance of earlier orders on scale of compensation to be recovered for violation of norms for mining on polluter pays principle and the matter was deferred for further consideration of such scale and further orders in the light of the EMGSM 2020. On the issue of scale of compensation for violations, the Tribunal held that the same has to be calculated having regard to the polluter pays principle and not mere loss of royalty. This requires taking into account value of the illegally mined material and cost of restoration of the environment. CPCB did the exercise by constituting an expert Committee. The Tribunal considered the report as follows:-

"8. The Committee considered two approaches:

(I) Approach 1: Direct Compensation based on the market value of extraction, adjusted for ecological damages.

(II) Approach 2: Computing a Simplified NPV for ecological damages.

- 9. In the first approach, the criteria adopted is:
- Exceedance Factor (EF).
- Risk Factor (RF).
- Deterrence Factor (DF).
- 10. Approach 1 is demonstrated by Table 1 as follows:

Table No. 01: Approach 1						
Permitted	Total	Excess	Exceedance	Compensation		
Quantity	Extraction	Extraction	in	Charge (in Rs.)		
(in MT or	(in MT or	(in MT or	Extraction:			
m3)	m3)	m3)				

X	D * (1+RF + DF)
Y	Where $D = Z x$
Z = Y - X	Market Value-
Z/ X	ofthe-material-
	per-MT-or-m3 11
	DF = 0.3 if Z/X =
	0.11 to 0.40 DF =
	0.6 if $Z/X = 0.41$
	to 0.70 DF = 1 if
	Z/X >= 0.71
	RF = 0.25, 0.50.
	0.75, 1.00 (as per
	table 2)

11. Approach 2 is demonstrated by following formula:

"Till such time as data and information for a comprehensive NPV is worked out in a site specific manner to account for all (or atleast the major) ecological damages, a simplified NPV, proxied on the market value of the illegally extracted amount may be computed. In this case the NPV approach would imply that the total benefits from the activity of sand mining (as represented by the market value of the extracted amount) be deducted from the total ecological costs imposed by the activity. In the absence of data on benefits and costs separately, we recommend a modification of the formula as shown below:

Total Benefits (B) = Market Value of illegal extraction : D (refer Table 1)

Total Ecological Costs = Market Value Adjusted for risk factor: D *****RF (refer Table1).

For present purposes, it is assumed that the Benefits would accrue only in the first year (in which the extraction of the illegally mined material takes place), while the ecological costs would continue to be felt over a period of time. NPV is to be calculated for a period of 5 years on the net value, Σ (C-B), at a discount rate ranging from 8%-5%, varying in inverse with the risk factor. Thus, where the highest risk factor (say 1) is applicable, the discount rate applicable would be the lowest (say 5% in this case)."

12. Final recommendation is as follows:

"Thus, it is recommended that the annual net present value (NPV) of the amount arrived at after taking the difference between the costs and the benefits through the use of the above approach, maybe calculated for a period of 5 years at a discount rate of 5% for mining which is in a severe ecological damage risk zone. The rationale for levying this NPV is based on expert opinion that reversal and/or restoration of the ecological damages is usually not possible within a short period of time and rarely is it feasible to achieve 100% restoration, even if the sand deposition in the river basin is restored through flooding in subsequent years. The negative externalities of the mining activity are therefore to be accounted for in this manner. Ideally, the worth of all such damages, including costs of those which can be restored should be charged. However, till data on site-specific assessments becomes available, this approach may be 12 adopted in the interim. In situations where the risk categorization charged. However, till data on site-specific assessments becomes available, this approach may be adopted in the interim. In situations where the risk categorisation is unavailable or pending calculation, the following Discount Rates may be considered:

Severity	Mild	Moderate	Significant	Severe
Risk level	1	2	3	4
Risk factor	0.25	0.50	0.75	1.0
Discount	8%	7%	6%	5%

...

12. The Tribunal directed undertaking of scenario analysis, as suggested on behalf of the applicant and to furnish a further report accordingly. Further report dated 12.10.2020 has been filed by the CPCB reiterating its earlier report. We propose to approve approach-2 in the report."

(Emphasis supplied)

19. That this Hon'ble Tribunal has already approved the method of computation of compensation in illegal sand mining cases, therefore, the Joint Committee in the present case may also compute the magnitude of environment loss in the same manner as was approved by this Hon'ble Tribunal in OA No. 360 of 2015.

20. That additionally, environmental compensation should also be computed for the trees cut on the hills due to the mining activity. The Hon'ble Tribunal in the recent Order dated 16.11.2022 in *Vijay Chawla v. Ministry of Environment, Forest and Climate Change & Ors.* (Original Application No.234/2022) had held the value of each tree cut to be equal to Rs. 2 lakhs and directed for environmental compensation of this amount to be paid for each tree being cut. The Hon'ble Tribunal held:

"8. Accordingly, while accepting the report to the effect that there are violations in cutting of trees and other activities, the status of deemed forest needs to be duly restored. Compensation needs to be recovered for illegal cutting of trees. It is undisputed that about 500 trees have been cut. **We fix compensation for such violation at Rs. 10 crores, taking the value of each tree at Rs. 2 lakhs. Apart from the said compensation and liability to restore the forest land, the PP will be required to do afforestation to the extent of 10 times in consultation with the DFO, Faridabad within three months from today**."

(Emphasis supplied)

Copy of the Order dated 16.11.2022 in *Vijay Chawla v. Ministry of Environment, Forest and Climate Change & Ors.* (Original Application No.234/2022) is annexed herewith as ANNEXURE A-9.

Response of the Applicant to the observations made by Director, Mines and Geology, Department of Haryana in its Affidavit dated 08.10.2022

- 21. That vide Order dated 23.05.2022, the Hon'ble Tribunal had directed the Director, Mines and Geology, Department of Haryana to submit information regarding complaints received in the past 5 years regarding illegal mining, action taken on them, vehicles impounded or confiscated, number of cases where proceedings of recovery of penalty and environmental compensation was initiated and what steps were taken for environmental restoration in areas of illegal mining.
- 22. That as regards recovery of penalty and environmental compensation, the Affidavit dated 08.10.2022 states that from August 2019 onwards, 2110 vehicles were impounded out of which 838 vehicles were released after

recovery of Rs. 24,74,37,329/- as environmental compensation. It is submitted that this compensation only pertains to the vehicles that were impounded and no recovery of compensation has been made from illegal mining. An RTI Application was filed to the Directorate of Mines and Geology, Government of Haryana, seeking information on amount of money collected from vehicles impounded for illegal mining in Gurugram, Faridabad and Nuh Districts from January 2010 till 31 May 2022 and money collected by way of fines, penalty and environmental compensation in cases of illegal mining in Gurugram, Faridabad and Nuh Districts from January 2010 till 31 May 2022, the authorities informed that total amount for year wise penalty / environmental compensation from 2010 to 2022 is INR 24,96,04,528.

Copy of the RTI Application and the Reply dated 08.08.2022 of the Directorate of Mines and Geology, Government of Haryana is annexed herewith as **ANNEXURE A-10.**

- 23. That it is submitted that the Directorate of Mines and Geology, Government of Haryana needs to clarify the amount of money that has been recovered as environmental compensation as there is a clear discrepancy between the information provided in the Affidavit dated 08.10.2022 submitted before this Hon'ble Tribunal and the Reply to the RTI Application.
- 24. That the environmental compensation so recovered should be used by the authorities for ecological restoration of the illegally mined areas.
- 25. That the Affidavit has also not provided any information on point no. (e) that required the Director, Mines and Geology Department to state the steps that were taken for environmental restoration. It states:

"7....Director General of Police and Director, Mining & Geology, Government of Haryana are also directed to file affidavits giving information regarding the following aspects:

(e) What steps were taken for environmental restoration in the areas of illegal mining."

26. That no information has been given by the Director, Mines and Geology Department on whether any restoration has taken place and if any steps have been taken regarding the same.

ECOLOGICAL RESTORATION OF ARAVALLI AREAS DEGRADED BY ILLEGAL MINING

- 27. Many Aravalli hills in Gurugram, Nuh and Faridabad have been broken and destroyed beyond repair. The belt where illegal mining in the Aravallis has been taking place after the Supreme Court ban on mining is extremely degraded and needs an ecological restoration plan. Aravalli Bachao Citizens Movement has consulted with experts in the field of conservation and ecology namely Dr. Ghazala Shahabuddin, Neha Sinha, Dr Pia Sethi, Dr Rajendra Singh and Prerna Bindra regarding the steps that should be taken for ecological restoration and conservation of the illegally mined and severely degraded Aravalli areas. Profiles of these experts is annexed herewith as ANNEXURE A-11.
- 28. Central Empowered Committee of the Supreme Court and the National Green Tribunal should approve the conservation plan for the illegally mined and degraded Aravalli areas.

Recommendation by Conservationists for Ecological Restoration of Illegally Mined Areas in the Aravalli Forests and Hills of Gurugram, Nuh and Faridabad Districts

29. The entire belt of the Aravalli hills and forests in Gurugram, Nuh and Faridabad destroyed by illegal mining activities should be restored through a combination of natural regeneration and assisted regeneration i.e. planting of native Aravalli flora, soil and water conservation measures. The endangered/at risk species plants, animals, birds, insects - who are the natural inhabitants of Aravallis must be clearly identified and listed and conservation objectives should be specified. It is imperative to understand the wildlife, human interventions, community impact and extent of restoration effort required. Strict guidelines should be developed for water usage and soil conservation. Monitoring of Aravalli aquifers and groundwater tables should be done. Haryana has an excellent model of such kind of ecological restoration work done in the Aravali Biodiversity Park on MG road in Gurugram which is a 350+ acres of a previously mined and highly degraded Aravalli area that has been converted into a lush green forest of native Aravalli flora. The Aravali Biodiversity Park which is home to different kinds of native Aravalli flora species like Dhak, Salai etc and many native mammals, reptiles, amphibians, birds, butterflies and insects, has been given global recognition. The Ecologist Vijay Dhasmana who was associated with rewilding the Aravali Biodiversity Park should be brought on board as a Consultant to restore the illegally mined Aravalli areas in Gurugram, Nuh and Faridabad.

- 30. Implement ecological restoration (through an agency/expert with proven track records such as done in the Aravali Biodiversity Park in Gurugram) in a smaller area i.e. about 10-25% of the total area in phase one. Adapt and sustain to restore ecosystem services and make the model self-sustaining, cost neutral and then revenue generating. Then, scale and replicate to the full area.
- 31. The entire stretch of the illegally mined Aravalli areas in Gurugram, Nuh and Faridabad should be either be declared as a Protected Area. Alternatively, a network of strictly protected zones and community reserves / biodiversity heritage sites can also be considered to conserve the degraded and illegally mined Aravalli forests & hills where local rural communities can hold rights to restricted forest use.
- 32. All Aravalli areas in Haryana from Asola sanctuary in Delhi to Mangar Bani, Damdama lake all the way to Sariska national park in Rajasthan should be declared as a Protected Area (community reserve, conservation reserve, wildlife sanctuary) to create an unfragmented wildlife corridor in the Aravallis spread across Delhi, Haryana and Alwar in Rajasthan. The Protected Area must provide safe passage for wildlife, with no red or destructive industry or infrastructure within this area.
- 33. A protection plan must be put into place. Sufficient number of forest guards or any such appropriate authority along with community guards should be the primary defence to protect the wildlife of the region. This must be supplemented with Advanced Drone Technology as a monitoring tool to regulate and control illegal encroachments and mining activities in this area.
- 34. Position the Aravallis around Faridabad, Gurugram and Nuh as nature and wilderness zones. Many countries such as Japan, South Korea and Finland have created "healing spaces" by leveraging their forests and natural habitats. Below link gives details on how South Korea has used its natural habitat to create healing forests throughout the country.

https://healingforest.org/2020/10/21/forest-bathing-secrets/

Aravallis in Haryana can be used as a range dotted with "healing spaces" and forest immersion experiences where overloaded minds, overworked bodies and overwhelmed souls can come and find mental peace, solace and good health. This can be done by developing concept of 'Learning From Nature':

- Organising healing forest walks, nature meditations and forest art workshops.
- Organising sessions where elders and locals share forest wisdom.
- Doing action projects that give back to nature.
- Setting up forest schools and nature camps for children to learn from the wild.
- Nature-based and guided bird watching trips.
- 35. Aravalli Bachao Citizens Movement asks for the restoration of the Aravalli hills and forests where illegal mining has taken place by giving these areas protected status so that the ecosystem services they provide can be enhanced to protect Delhi-NCR as the region faces the adverse impacts of climate change, water stress and air pollution. Forest restoration of the degraded illegally mined Aravalli areas using native species will also contribute to India's Nationally Determined Contributions, and improve Haryana's abysmally low forest cover which is currently a meagre 3.6% of the geographical area (FSI, 2021), and well below the national average of 20%.

SUGGESTIONS BY THE APPLICANT WITH RESPECT TO MONITORING AND STOPPING OF ILLEGAL MINING

- 36. **Setting up of an Independent Aravalli Protection Authority:** An independent Aravalli Protection Authority must be formed for the conservation and protection of the Aravalli region across all 4 states. This is also one of the prayers in the original application. Besides having government officials, 50% of this autonomous body must consist of noted independent experts in the field of conservation, ecology, wildlife, rewilding, hydrology, waste management, etc. and representatives from citizens' movements, local rural communities etc.
- 37. **Promotion of Alternative Building Materials:** The increasing urbanisation and real estate construction activities have increased the demand for construction materials, which gets fulfilled by illegal mining. Government should promote the use of alternative materials like fly ash bricks and earth bricks so that our hills are not razed to the ground to feed the never ending construction. Use of construction and demolition waste in construction to replace aggregates from crushed virgin stone is recommended by the National Building Code and also by the MoEFCC and

MoHUA. The use of virgin aggregates must be discouraged in order to ease the pressures on the Aravalli mountain ecosystem and in their place waste from construction debris and industrial by products such as slag from steel and aluminium must be used as is the practice in states like Orissa and Bihar. It is high time that such things are mainstreamed in Haryana and other Aravalli states so we can protect our hills from being razed to the ground.

- 38. **Protecting Aravallis by using Advance Drone Technology:** The Honourable National Green Tribunal (NGT) in its order dated 23rd May 2022 in the matter of Aravalli Bachao Citizens Movement vs Union of India & Others (Original Application No.362/2022) observed: "*The averments made in the petition raise substantial questions relating to adequacy* and *efficacy as well as failure of surveillance and monitoring mechanism evolved for preventing illegal mining and measures required to be taken for this purpose in the area and protecting the Aravalli range from further degradation in view of its immense ecological importance."*
- 39. By incorporating directions given in several court orders, the Ministry of Forest, Environment and Climate Change (MoEF&CC) formulated its recent guidelines i.e Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 which recommend:
 - Use of unmanned aerial vehicles (UAVs), also known as Drones, with advanced cameras to identify illegal sand mining hotspots.
 - Constant monitoring of mining activity using Drones and night surveillance of mining activity to be done using night-vision Drones.

Section 5.2.2 of the EMGSM-2020 guidelines (Page 31-32) lays down in detail the instruments and software requirement for such monitoring.

Government of Haryana should follow the EMGSM-2020 guidelines and various court orders and use Advanced Drone Technology and other tools for monitoring and stopping illegal stone and sand mining and other non-forest activities in the Aravallis.

Table 1: Court Orders related to Monitoring of Illegal Mining using

 Technology/Drones

SI	Party Name	Date of	Relevant orders
No.		orders	
1	OA No. 173 of	04.09.2018	NGT directed MoEFCC to revise
	2018		the Sustainable Sand Mining and

2	Sudarsan Das v. State of West Bengal & Ors OA No. 44 of 2016 Mushtakeem Vs	05.09.2018	Management Guidelines 2016 due to persistent gaps in monitoring illegal sand mining from river beds by the states. Court directed for a dedicated monitoring mechanism
	MoEF & CC and Ors.		to be set up. The order mentioned the Mining Surveillance System (MSS) developed by the Ministry of Mines & Indian Bureau of Mines. MSS is a satellite based monitoring system which aims to curb instances of illegal mining activity through automatic remote sensing detection technology.
3	OA 360/2015 National Green Tribunal Bar Association Applicant(s) Versus Versus Virender Singh (State of Gujarat)	05.04. 2019	State government directed to set up effective monitoring mechanism for preventive and remedial measures including surveillance system and recovery of compensation.
4	O.A. No. 40/2020/ EZ Pawan Kumar Vs. State of Bihar & Ors.	14.10.2020	Court directed that in preparation of DSR, the procedure and the parameters laid down under the Sustainable Sand Mining Management Guidelines (SSMMG) 2016 and Enforcement and Monitoring Guidelines for Sand Mining (EMGSM) 2020 will be read in sync with each other and followed. In case of any ambiguity or variation between the provisions of these documents, the provision made of the "EMGSM-2020" shall prevail.

5	OA 169/2020	18.1.2022	NGT order stated that Advance
	Kuldeep Singh		Technological Drones should be
	Versus State of		provided to the Haryana State
	Haryana & Others		Mining Department to take
			prompt action against illegal
			mining activity.

Examples of Use of Drones for checking Illegal Mining in India

Jharkhand: Drones are being used by the forest department in Jharkhand for monitoring forest growth, tracking movement of wildlife and checking forest fires. In addition, Drones have also proved to be helpful in monitoring the legal mining done in the forest areas and checking illegal mining, and helps monitor the actual reclamation done by the mining companies after mining is completed in particular areas.

Gujarat: The Drone Surveillance Project was initiated in 2018 by the former Gujarat Chief Minister Vijay Rupani to keep an eye on illegal sand mining in rivers like Sabarmati. The project led to a 144 per cent increase in penalties recovered from individuals involved in illegal mining activities in Gujarat since 2018, according to the Commissioner of Geology. During the four-year period (2017-21), the number of illegal mining cases was reduced by 8.5 per cent in Gujarat. A total of over 30,146 illegal mining cases were registered across Gujarat during the same period. The Mining Surveillance System uses space technology for curbing illegal mining activities was developed in the country through the Indian Bureau of Mines by the Union Ministry of Mines. The project has been discontinued as of January 2021 according to news reports. In the HT article dated 16th January 2022, the Commissioner of Geology is quoted as saying that the project will be restarted soon.

Other states such as Tamil Nadu, Bihar, UP and Punjab have also announced plans to use Drones for monitoring and stopping illegal mining.

Favourable Environment for Use of Drone Technology in Haryana

Haryana is the first state to create a separate corporation to speed up the Unmanned Aerial Vehicle (UAV) or Drone Driven Governance. The Drone Imaging and Information Service of Haryana Limited (DRIISHYA) will help undertake aerial surveys, imaging and mapping to facilitate decision support activities for various organs of the government. It will acquire, manage, operate and maintain Drones and Unmanned Aerial Vehicles (UAVs) as imaging and information collection platforms with sensors of various kinds. It is also setting up a training institute to train Drone pilots. The procurement of Drones for checking on illegal mining and other illegal activities in the Aravalli and Shivalik hills and forests can easily be routed through this corporation.

"This is a unique beginning in the state as now with the help of Drones, illegal encroachments can also be controlled along with detecting expansion of area as earlier manual surveys were conducted at regular intervals which were very time consuming, costly and required more manpower," said Haryana's Chief Minister Mr. Manohar Lal Khattar, quoted in the 15th April 2022 India Times news article. Mr. Khattar said that besides the Revenue Department, the use of Drones should also be ensured by other departments like Mining, Forest, Urban Local Bodies, Disaster Management, Power, Traffic, Town and Country Planning, Agriculture, etc.

The Haryana State Forest Department had initiated and piloted a Drone program in 2018 and spent Rs 20 lakh to procure two Drones. While the basic drone was to carry out survey, the industrial drone could be embedded with various sensors, including the thermal sensor, to spot any crime against wildlife or non-forest activity like cutting trees, building roads, illegal mining and encroachments, in real time. This drone was fitted with an optical sensor of 43 megapixels and a camera and could fly up to 250 metres at a speed of more than 60 metres per hour. Both the Drones were equipped with night-vision cameras and were tested successfully in the Bandhwari region of the Aravallis. "These Drones will help in gathering data of forest health, encroachments, the presence of wildlife to prepare management plans and developing decision support. The Drones can take several pictures and videos that are better than satellite images and thus can be used for making a 3D model of the area," stated Vinod Kumar, Chief Conservator of Forests (Wildlife), Gurugram circle in the TOI article dated 5th May 2018.

Initially a private company was helping to operate these Drones but after the formation of DRIISHYA, the forest department has handed over the 2 Drones to the corporation. Going forward, DRIISHYA can act as a nodal agency to coordinate Drone flying permits for various departments, i.e. forest department, police and mining department, for the purposes of tracking illegal mining and other illegal activities in the Aravalli hills and forests.

Newspaper articles showing usage of drone technology are annexed herewith as **ANNEXURE A-12**.

Email sent by the Aravalli Bachao Citizens Movement to the Haryana Chief Minister and all other government officials on 2nd August 2022 regarding the use of drones and Document detailing why Advanced Drone Technology should be used for protection of Aravallis and Shivaliks sent with the email is attached as **ANNEXURE A-13**.

In light of the above facts and circumstances, the Applicant prays for the following with regard to use of drone technology:

- a) Direct the Haryana government authorities to use 'Advanced Drone Technology' and other latest tools for monitoring illegal sand and stone mining in the Aravallis to bridge gaps in the current surveillance and monitoring system and to prevent and apprehend the perpetrators of illegal felling of trees, encroachments and other non-forest activities.
- b) Direct that Illegal mining mostly happens early morning from 6 am to 10 am. It is imperative for drones to be used at this time and at night when dynamite blasting is done to break the hills.
- c) This drone surveillance data must be put up on a public website for citizens, independent experts and media to monitor the footage.

) Pass any other order as this Hon'ble Tribunal may deem fit in the facts and circumstances of the present case.



THROUGH

RITWICK DUTTA

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Mobile: +91 9312407881 Email: <u>litigation.life@gmail.com</u>

VERIFICATION

Verified by Jyoti Raghavan, W/O Ashish Khanduja, authorised representative of Applicant Organisation, aged about 46 years, R/o H. No. Heritage Apartment, Plot 10, Sector 11, Dwarka, New Delhi- 110078, do hereby verify that the contents of Paragraphs 1 to <u>38</u> are true to my personal knowledge and nothing material has been concealed therefrom.



PLACE: Dehr DATE: 28/4/2022 BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL PRINCIPAL ZONAL BENCH AT NEW DELHI ORIGINAL APPLICATION NO. 362 OF 2022

IN THE MATTER OF:

Aravalli Bachao Citizens Movement

...Applicant

Versus

State of Haryana & Ors.

...Respondents

AFFIDAVIT

I, Jyoti Raghavan, W/O Ashish Khanduja, authorised representative of Applicant Organisation, aged about 46 years, R/o H. No. Heritage Apartment, Plot 10, Sector 11, Dwarka, New Delhi- 110078, do hereby solemnly affirm and declare as under:

1. That I am the Managing Trustee of Applicant Organisation in the above titled Application and conversant with the facts and circumstances of the case and competent to swear this affidavit.

2. That the contents of the accompanying Reply are true and correct and nothing material has been concealed therefrom.



VERIFICATION

Verified on this ______ day of ______ 2022 2022 that the contents of the present Affidavit are true and correct to my knowledge and belief and nothing material is concealed therefrom.

ATTESTED



Ara DEPONENT

Annexure A-1



Annexure A-2

Photographs from Aravalli area near Tikli Village (Ansal Retreat area) dated 06.11.2022



पुलिस-खनन विभाग टीम ने खरक³²³ जलालपुर में मारा छापा, नौ पर केस Annexure A-3 (Colly)

संवाद न्यूज एजेंसी

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तावडू। प्रशासन के लाख दावों के बावजूद क्षेत्र के अरावली पहाड़ियों में अवैध खनन का खेल जारी है। सूचना पर शनिवार रात पुलिस और खनन विभाग टीम ने गांव खरक जलालपुर में संयुक्त रूप से छापा मारा। कार्रवाई की भनक लगते ही आरोपी मौके से भाग गए। पुलिस ने खनन स्थल से एक ट्रैक्टर जब्त कर लिया है। मामले में नौ लोगों के खिलाफ मामला दर्ज कर पुलिस ने जांच शुरू कर दी है।

तावडू सदर थाना प्रभारी अरविंद कुमार से मिली जानकारी के मुताबिक खरक जलालपुर गांव से सटे अरावली क्षेत्र में देर रात अवैध खनन होने की सूचना मिली थी। सूचना के आधार पर खनन विभाग व पुलिस की संयुक्त टीम गांव खरक जलालपुर पहाड़ी में निरीक्षण करने पहुंची। जहां पर चार पांच व्यक्ति एक ट्रैक्टर ट्रॉली में अवैध रूप से पत्थर भरते हुए मिले। पुलिस टीम को देख आरोपी ट्रैक्टर ट्रॉली छोड़कर भाग गए। पुलिस जांच पड़ताल करने पर पता चला कि खरक जलालपुर निवासी हारून, कल्लू, खट्टी, कोचन साकिर, काला व अरशद आदि मिलकर अपने-अपने ट्रैक्टर से पत्थर व अन्य खनन सामग्री चोरी करते हैं। भंगवो निवासी खालिद अपनी जेसीबी से पहाड में रास्ता बनाने और पत्थर भरने में मदद करता है। वहीं डावला की ढाणी निवासी रफीक अवैध खनन सामग्री को अंसल फार्म हाउस में निर्माण कार्य के लिए प्रयोग करता है। पुलिस के मुताबिक रफीक की मिलीभगत से ही ट्रैक्टर--ट्रॉलियों से



घटनास्थल पर वाहनों के ताजा निशान।

खनन कर रहे आरोपी मौके से भागने में रहे सफल, एक ट्रैक्टर लिया कब्जे में

रात होते ही शुरू हो जाता है खेल

सूत्रों से मिली जानकारी के मुताबिक खनन विभाग के लाख दावों के बावजूद भी क्षेत्र में रात के अंधेरे में अवैध खनन का खेल चल रहा है। रात होते ही खनन माफिया सक्रिय हो जाते हैं। जेसीबी मशीन और ट्रैक्टर-ट्रालियों में अवैध खनन का पत्थर अंसल क्षेत्र में बने दुर्गम रास्तों से बादशाहपुर सीमा में पहुंचाया जाता है। जहां पर बड़ी गाड़ियों में इसे लोड कर आगे भेजा जा रहा है। बीते बुधवार को पर्यावरण प्रेमी कुछ लोगों ने सोहना एसडीएम से इस संबंध शिकायत भी दर्ज कराई थी।

अवैध खनन किया जा रहा है। उपरोक्त सभी के खिलाफ पुलिस ने केस दर्ज कर लिया है। साथ ही ट्रैक्टर ट्रॉली को मौके से जब्त कर लिया है।





Fwd: Ilegal mining documented in Aravallis near ITC Grand Bharat Hotel in Manesar

From Aravalli Bachao <aravallibachao.team@gmail.com>

To itisha.awasthi@proton.me

Date Monday, November 28th, 2022 at 1:24 PM

----- Forwarded message ------From: Aravalli Bachao <aravallibachao.team@gmail.com> Date: Sat, Sep 17, 2022 at 5:55 PM Subject: Ilegal mining documented in Aravallis near ITC Grand Bharat Hotel in Manesar To: <<u>cs@hry.nic.in</u>> Cc: adgp.laworder@hry.nic.in>, <<u>bhupender.yadav@sansad.nic.in></u>, <<u>secy-moef@nic.in</u>>, Gurgaon North Region Hspcb <<u>hspcbrogrn@gmail.com</u>>, <<u>ccb.cpcb@nic.in</u>>, <<u>mscb.cpcb@nic.in</u>>, <u>pccf-hry@nic.in</u> <pccf-hry@nic.in>,, Pspccf@gmail.com <Pspccf@gmail.com>,, papccf@gmail.com <papccf@gmail.com>,, pccfwlhry@gmail.com <pccf-</pre> hry@nic.in>, <anilvijcomplaints@gmail.com>, <police@hry.nic.in>, <dmg.mines-hry@nic.in>, <adcnuh@hry.nic.in>, <cforest@hry.nic.in>, <<u>hspcb.ms@gmail.com>, varunsingla.ips@gmail.com</u> <varunsingla.ips@gmail.com>, <cp.ggn@hry.nic.in>, <<u>spmwt@hry.nic.in</u>>, <<u>dcp.southggn@hry.nic.in</u>>, <<u>dcp.hqggn@hry.nic.in</u>>, T.L. Satyaprakash,IAS <dcgrg@hry.nic.in>, <dcnuh@hry.nic.in>, <<u>cf.gurgaon@gmail.com></u>, <<u>acsmghry@gmail.com></u>, <<u>acs-</u> minesg@hry.gov.in>, <jtcp.ggn@hry.nic.in>, <<u>cmharyana@nic.in</u>>, Dushyant Chautala <<u>deputycmharyana@gmail.com</u>>

Dear Chief Secretary,

With reference to our below email dated 2nd August 2022 regarding the use of Advanced Drone Technology to curb illegal mining in the Aravallis, this mail is to bring to the attention of the Haryana government authorities that illegal mining is going on in the Aravallis despite the Supreme Court ban and the formation of the Joint Committee by the NGT order dated 23rd May 2022 in

495.54 KB 2 files attached

Using Drones to Protect Aravallis & S... ks.pdf 367.88 KB

16 locations.docx 127.67 KB

the matter of Aravalli Bachao Citizens Movement vs Union of India & Others (Original Application No.362/2022) to stop illegal mining in the Aravallis in Gurugram, Faridabad and Nuh. Please see the photos and video of illegal mining activity in this

tweet thread we have made today:

https://twitter.com/AravalliBachao/status/1571056386821459970? s=20&t=MnTD26Of0hOU3hHV54FE_A

The 2 images and video of illegal mining taking place in the Aravallis close to ITC Grand Bharat Hotel in Manesar used in the above tweet thread was sent to us by one of the regular walkers in the Aravallis. This location is near village Kharak in the vicinity of these coordinates:

28.297888, 77.00233

28.300366, 77.002921

This is one of the 16 locations that the Aravalli Bachao Citizens Movement has highlighted in the NGT case filed by us in May 2022 on illegal mining in NCR Aravallis. Document showing the 16 locations of illegal mining with their coordinates is attached with this email.

The illegal mining activity was going on at 7:45 am in the morning today when the images and video was taken. In 15 minutes, the illegal miners uploaded 2 tractor loads. When the people indulging in illegal mining realised that they have been photographed, they snatched the walkers' mobile and deleted the photos and videos of their activities from his phone. The 2 images and videos used in the above tweet thread was sent to the Aravalli Bachao team by the walker before his mobile was taken away.

Please use drones to survey the above location and the other 15 locations mentioned in the attached word document titled '16 locations' early morning from 6 am till 9 am when these illegal miners are most active to document illegal mining and thereafter take action against the culprits. Hill after hill is being razed to the ground and we are losing our most critical water recharge zone, green lungs, barrier against desertification and wildlife habitat with the Aravallis being destroyed by this illegal mining. If proper systems are put in place to use drones effectively to monitor illegal mining in the Aravallis by the Haryana government, citizens will not have to put themselves at risk to bring such illegal activities to the attention of the authorities.

Hoping that the government will act on this asap so more damage is not done to our precious Aravallis.

Sincerely,

Jyoti Raghavan

Annexure A-4



Aravalli near Jalalpur Sohna Village close to ITC Grand Bharat hotel (22.11.2022)



Aravalli near Kota Khandewla Village near Manesar Police Lines Complex (March 2022)



Annexure A-6







null, Haryana, India Unnamed Road, Haryana 122413, India Lat 28.303038° Long 76.912626° 27/02/22 09:11 AM



Aravalli near Bharadwaj lake area (March 2021)





Aravalli forest area near Baliawas village (27.11.2022)

Annexure A-9

Item No. 06

Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No.234/2022

(With report dated 14.11.2022)

Vijay Chawla

Applicant

Versus

Ministry of Environment, Forest and Climate Change & Ors.

Respondent(s)

Date of hearing: 16.11.2022

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER HON'BLE PROF. A. SENTHIL VEL, EXPERT MEMBER

Applicant: Mr. Sidhinath Sengar, Advocate

Respondent(s): Mr. Rahul Khurana, Advocate for the State of Haryana & HSPCB Mr. Raj Panjwani, Senior Advocate with Mr. Saurabh Rajpal, Advocate for SVC & Lahri (R - 10)

ORDER

1. Grievance in this application is against cutting of trees in Village Sarai Khawaja, Faridabad, by Respondent No. 10, SVC & Lehri, Jublee Hills, Hyderabad, in violation of order of this Tribunal dated 08.03.2019 in O.A. No. 407/2017, Lt. Col. (Retd.) Sarvadaman Singh Oberoi vs. State of Haryana & Ors. holding the area to be 'deemed forest'. FIR dated 10.01.2020 has been filed by the Forest Department but still cutting of trees is continuing by Respondent No. 10, in violation of law without remedial action. 2. Vide order dated 13.04.2022, the Tribunal sought a factual report from DFO, Faridabad, District Magistrate, Faridabad and State PCB and also directed that if on verification it is found that cutting of trees and construction activities are illegal, the authorities may ensure remedial action, including prevention of illegal cutting of trees and stopping construction activities without requisite consent/clearance under environmental laws from statutory regulators.

3. An action taken report has been filed on 14.11.2022 *inter-alia* acknowledging that the area in question is deemed forest and FIR was lodged on 10.01.2020 against illegal felling of trees. The relevant extracts from the report are:

"Status of the land and provisions of the Indian Forest Act, 1927 & the Forest Conservation Act, 1980

- 8. The Aravali Notification, 1492 is not applicable to the load in question. The said notification is applicable to district Gurgaon and Mewat only and not to the district Faridabad.
- 9. The land in question is not notified under Special Notification(s) issued under Section 4 & 5 of the Punjab Land Preservation Act (PLPA), 1900. The judgment passed by Hon'ble Supreme Court regarding Provisions of PLPA is not applicable to the land in question.
- 10. The land in question neither falls under reserved forest nor protected forest. Hence, provisions of Forest Conservation Act, 1980 are not applicable on the land in question.
- 11. The applicant has sought declaration of land in question as deemed forest referring the order dated 08.03.2019 passed by this Hon'ble Tribunal passed in OA No.407/2017 (Lt. Col (Retd.) Sarvadaman Singh Oberaoi) passed in respect of land under consideration in said OA. It is submitted that said order was challenged by the M/s Ajay Enterprises and State of Haryana in their respective Civil Appeals and those are pending before Hon'ble Supreme Court of India. The Hon'ble Supreme Court of India, vide interim order dated 12.07.2019 directed that there shall be no cancellation of any permissions granted, in the meanwhile.
- 12. That land in question is Gair Mumkin Pahar and is closed under the general section 4 of Punjab Land Preservation

Act wherein tree felling without permission from Divisional Forest Officer is prohibited.

- 13. The felling of trees caused at the land in question without obtaining permission for the same. Therefore, FIR No.24 dated 10.01.2020 was lodged with Police Station Suraj Kund. Further, Forest Offence Report (FOR) No.0452/100 dated 13.01.2020 has been registered and filed before Special Environment Court, Faridabad. It is submitted that as per report of Range Forest Officer, Faridabad total number of trees found cut on the spot are as follow:
 - a. 448- Undersize Miscellaneous Species
 - b. 01- Safeda
 - c. 43- Miscellaneous Specious

Developmental Activities at the site:

- 14. The license bearing no. 50 of 2022 dated 22.04.2022 was granted by the Town & Country Planning Department on land bearing khasra no. 70// 8/2 (3-12), 9/1 (1-13), 12/2 (1-13), 13 (8-0), 14 (8 0), 17/2 (7-10), 18 (8-0), 19/1 (1-13), measuring 5.00625 acres in Village Sarai Khawaja to M/s SVC & Lahari. The entire area under ownership of the Respondent No.10 including the licensed land has been bounded by approx 6 ft. high boundary wall and partly with sheet fencing. The license granted land has been demarcated with burji and toe wall as per the approved area and Layout Plan. The sewer network has been laid partly in the license granted land (approx 418 Rmt. Stretch). The road network has been demarcated, however, no earth filling and WBM (Water Bound Macadam) has been done. No construction has been raised on any of the license granted demarcated site. No development activity has been observed in the area beyond the license granted land except a site office measuring approx 165.85 Sqm. has been raised.
- 15. It will be relevant to reproduce the para No.7 of the report dated 13.09.2020:

"7...... Vide Memo No. LFA- II/2022/932-35 dated 24.08.2022, instructions have been issued to the concerned official/persons to ensure that no development work shall be taken up at the impugned site, no standing trees shall be cut and no third party rights be created in the project on the basis of licence in question. In addition to above instructions, the Commissioner of Police has also been requested to direct the Chowki Incharge to make regular inspections at the site in question."

The report is submitted accordingly."

4. The applicant submits that in view of admitted violations, accountability for past violations be fixed, apart from remedial action taken or which may be taken in future.

5. The Project Proponent, M/s SVC & Lahri has filed response on 15.11.2022, contesting the report. PP has inter alia stated that the issue has been earlier dealt with in two cases and thus this petition should not be entertained.

6. We find that the issue of area being deemed forest now stands concluded by the judgment of the Hon'ble Supreme Court dated 21.07.2022 in *Civil Appeal No. 10294/2013, Narendra Singh & Ors. vs. Divesh Bhutani & Ors.* Thus the view earlier taken by this Tribunal vide order dated 05.03.2019 in *O.A. No. 407/2017, Lt. Col. (Retd.) Sarvadaman Singh Oberoi Vs. State of Haryana & Ors.* is in line with the said judgment.

7. With regard to earlier orders of the Tribunal in other cases, we note that vide order dated 14.09.2022 in *O.A. No. 69/2022, Parul Bawa vs. State of Haryana*, the matter was disposed of by this Tribunal with the observations that no further intervention of the Tribunal was necessary. However, the Tribunal noted that there were violations which were dealt with by the Authorities. However, adequacy of action was not considered. According to PP, constructive res judicata applies. We are unable to accept this plea as damage is to society by illegal use of forest land by PP and not to one individual who failed to claim full relief. There is no bar to legal action as may be required to remedy the wrong. Another order of this Tribunal is dated 15.02.2022 in *O.A. No. 46/2022, Greenfield Residents Welfare Society vs. Ministry of Environment, Forests and Climate Change & Ors.* Therein, the Tribunal directed DFO, Faridabad to take

remedial action as per law but adequacy and nature of action was not specified. In our view the same can be now done in view of clear violations, particularly in light of judgment of the Hon'ble Supreme Court in *Narendra Singh (Supra)*.

8. Accordingly, while accepting the report to the effect that there are violations in cutting of trees and other activities, the status of deemed forest needs to be duly restored. Compensation needs to be recovered for illegal cutting of trees. It is undisputed that about 500 trees have been cut. We fix compensation for such violation at Rs. 10 crores, taking the value of each tree at Rs. 2 lakhs. Apart from the said compensation and liability to restore the forest land, the PP will be required to do afforestation to the extent of 10 times in consultation with the DFO, Faridabad within three months from today.

The application is disposed of.

A copy of this order be forwarded to DFO, Faridabad by e-mail for compliance.

Adarsh Kumar Goel, CP

Sudhir Agarwal, JM

Prof. A. Senthil Vel, EM

November 16, 2022 Original Application No.234/2022 SN 336

Annexure A-10 (Colly)

RIGHT TO INFORMATION ACT 2005, RULE 3

The Director, Mines and Geology / Public Information Officer,

Directorate of Mines and Geology, Government of Haryana, DHL Square (2nd floor), Plot number - 9, IT Park, Sector - 22, Panchkula, Haryana.

Phone: 0172 - 4602104

1]	Name of the Applicant:	Sarvadaman Singh Oberoi
2]	Address & Contact Details:	1102, Tower 1, Uniworld Garden I,
		Sohna Road, Gurugram - 122001
		Mobile: 9818768349
3]	Details of the Information	
	Required:	
		Copy of documents showing money collected from vehicles
		impounded for illegal mining in Gurugram, Faridabad and Nuh
		Districts from January 2010 till 31 May 2022.
		Copy of documents showing money collected by way of fines,
		penalty and environmental compensation in cases of illegal
		mining in Gurugram, Faridabad and Nuh Districts from January

2010 till 31 May 2022.

Subject of Information: i]

Details with respect to Illegal Mining in Gurugram, Faridabad and Nuh districts.

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i]	Period of Information:	January 2010 till end May 2022
iii]	Details of Information:	As mentioned above
4]	Information needed by post or hand delivery etc. (Postage will be added in additional charges)	Registered Post
5]	In case of Postage (General, Registered or Urgent):	Registered Post
6]	Purpose to get the Information:	Protection of the environment
	Place: Gurugram	Date:20-06-2022

Signature

खनन अधिकारी, खान एतम भूविज्ञान विभाग, भुरुगप्रम / जूह ।

रार्गदमन सिंह ओक्सथ 1102, टावर 1. मूनिवर्ल्ड गार्डन 1. सोहना रोड, गुरुगाम ।

Uld artic 1320 tana 08-08-2022

तिषय :---

सूचना का अधिकार अधिनियम - 2005 1

अपरोक्त विषय ग आपका स्रृचित किया जाता है कि आप हारा मांगी यह सूचना जिन्द्र कवा 3 ओग्न प्रकार से हैं -

Year	Penalty Luvironment	
	compensation	
2010	3502800	
2011	23181800	
2012	16391450	
2013	6320000	
2014	24043771	
2015	19047000	
2016	12516431	
2017	10291010	
2018	6705741	
2019	5646335	
2020	88596212	
2023	27490296	
20	5871682	

यह जावका सूचनार्थ प्रतित है।

खनन अधिकारी सान एवल श्रविझान विभाग, गुरागाम / माह

ANNEXURE A-11

BRIEF PROFILE OF EXPERTS WHO HAVE SUGGESTED A PLAN FOR ECOLOGICAL RESTORATION OF THE ILLEGALLY MINED AREAS IN THE ARAVALLIS

Dr. Ghazala Shahabuddin is an ecologist working on issues at the interface of human society and biodiversity conservation in India and Asia. She has been involved in carrying out mammal and bird surveys in the Aravallis in Haryana. She is currently a Visiting Professor, Environmental Studies, Ashoka University, Haryana.

Neha Sinha is a conservation biologist and author based in Delhi. Her book Wild and Wilful was recently published to critical acclaim. She has contributed towards the National Biodiversity Targets along with the Government of India. Amongst the multiple environmental undertakings that she has upheld, is the Amur Falcon Campaign in Nagaland, the greatest conservation accomplishment tale of recent times. She is a member of IUCN Commission on Education and Communication, E-Bird India Sensitive Species committee and others, and has taught at Delhi University and Central Academy for State Forest Service.

Dr Pia Sethi is an ecologist, consultant and researcher who works in the area of the consequences of human activity on the ecology and management of forests and other ecosystems, and the dynamics of plant-animal interactions. She has 20 years of experience in ecological and policy-based research on forests, biodiversity natural resource management and climate change. She works as a Senior Fellow with the Centre for Ecology Development and Research and has been a team leader of several assignments conducted in India, the US, Guyana, and Fiji for clients such as UNDP, the World Bank, SIDA, JICA, GEF, and MOEF& CC, amongst others.

Dr Rajendra Singh also known as the 'Waterman of India' is a water conservationist who has decades of experience in reviving dried up rivers, other water bodies and regenerating degraded areas. He is a recipient of the Magsaysay Award in 2001 and Stockholm Water Prize in 2015. Dr Singh's organisation Tarun Bharat Sangh promotes community-driven-decentralized-management of natural resources.

Prerna Bindra is one of India's well-known conservationists who is a recipient of the Carl Zeiss Wildlife Conservation Award. She has served on the Uttarakhand State Board for Wildlife and was a member of the National Board for Wildlife and part of its Core Standing Committee between 2010 and 2013. She has worked with governments at the local, regional and federal levels, to conserve India's wildlife and wild habitats through policy and legal reform, promotion of education & awareness and by supporting effective action on the ground.

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Haryana deploys two drones to watch Aravalis

timesofindia.indiatimes.com/city/gurgaon/haryana-deploys-two-drones-towatcharavalis/articleshow/64035933.cms



This story is from May 5, 2018

Shilpy Arora / TNN / May 5, 2018, 07:08 IST



The project has been rolled out with an investment of Rs 20 lakh

GURUGRAM: In a first in <u>Haryana</u>, the state <u>forest department</u> has pressed into service <u>drones</u> in the <u>Aravalis</u>. Apart from monitoring wildlife, these drones will be used for spotting and preventing any non-forest activity like cutting trees, building roads and encroachments, as well as mapping of the ecologically sensitive forest. To start with, two drones — a basic drone and an industrial drone — have been launched in the Aravalis. The forest department on Friday conducted a demonstration of these drones in the <u>Bandhwari</u> area of the Aravalis.

The drones have been introduced after green activists raised a concern over rising <u>environmental violations</u> in the Aravalis.

While the basic drone can carry out survey, the industrial drone can be embedded with various sensors, including the thermal sensor, to spot any crime against wildlife or non-forest activity in real time. This drone is fitted with an optical sensor of 43 megapixels and a camera. It can fly up to 250 metres at a speed of more than 60 metres per hour. Both are equipped with night-vision cameras.

"We successfully tested the two drones on Friday for survey and surveillance of forest and wildlife areas. These drones will help in high-resolution mapping, gathering terrain and vegetation information, preparing 3D models of forest and wildlife areas," Vinod Kumar, chief conservator of forests (wildlife), Gurugram circle, told TOI.

"These drones will help in gathering data of forest health, encroachments, the presence of wildlife to prepare management plans and developing decision support systems. The drones can take several pictures and videos that are better than satellite images and thus can be used for making a 3D model of the area," he added.

The project has been rolled out with an investment of Rs 20 lakh. Both the drones have been sourced from the US. The drones are connected to a server, which will be operated by the department.

Currently, a private company will help the department operate the drones. However, the company is also training staff of the wildlife department to carry out various projects with the help of drones.

"It is a first-of-its-kind and a crucial step to protect the Aravallis. We are ready to take all significant steps to protect the forests in the state," said state forest and wildlife minister Rao Narbir Singh.

The drones were introduced in the wake of repeated demands from green activists. A high-level meeting was recently convened after the Union ministry of environment, forests and climate change (MoEF & CC) asked the state and regional forest department to submit a status report on the deployment of the Aravalis task force.

The activists had also met Union minister Harsh Vardhan in December last year and raised concern over traps found in the Aravalis to capture wild animals.

Start a Conversation

end of article

Jharkhand forest officials use drones to monitor movement of wild tuskers, check forest fires

newindianexpress.com/nation/2022/jun/09/jharkhand-forest-officialsuse-drones-to-monitor-movement-of-wild-tuskers-check-forest-fires-2463576.html



For representational purposes (Photo | EPS)

By <u>Mukesh Ranjan</u> Express News Service

RANCHI: Drones are being used by the forest department in Jharkhand for better documentation related to forest growth for submission to the Forest Survey of India, which carries inventory in forest and non-forest areas and develops a database on forest tree areas.

In addition to that, it is also used for keeping an eye on the movement of wild elephants and checking forest fires, which is a frequent phenomenon in summers. "We are using drones for technology up-gradation so that it could be used for monitoring and other purposes as per the requirement," said Principal Chief Conservator of Forests (PCCF), Development AK Singh. Divisional Forest Officers also asserted that it is being used for surveillance of forests and monitoring of plantations done by them and various other purposes.

"Drones are being used for surveillance of plantation areas as we can keep an eye on it very easily by using it. We can see through the aerial snapshots and video footage taken through drones, where we need to do more work, where it requires more efforts to ensure soil moisture conservation etc," said DFO Jamshedpur Mamta Priyadarshi. They are also using it for forest fires they can make it from a distance where there is an outbreak of fire in the forest, which enables them further to take measures to check it, she added. According to the Priyadarshi, snapshots taken from drone also gives them an idea of how far the fire has spread and also helps them to determine where the forest fire line has to be cut in order to control it in an effective way. DFO Gumla on the other hand said that drone is a great planning tool and has proved to be their eyes in the air, as it is used to examine forest landscapes, which is not possible manually.

Secondly, through the snapshots taken through drones, they have been able to present the work done by them. "Otherwise, it was difficult to show our efficiency through still photographs which cover a small area, but now through the snapshots and video footage taken by drones, it has become very easy for us to show our efficiency," said the Gumla DFO Shrikant Verma.

Moreover, drones have also proved to be helpful in monitoring the legal mining done in the forest areas and checking illegal mining, he added. "Drones help us in monitoring the actual reclamation done by the mining companies after mining is completed in particular areas, which otherwise was not possible," said the Verma.

"Drones have proved to be a great help in the planning of forestation and monitoring after the plantation is done in larger areas. Snapshots and video footage taken by drones also help us in planning and management of the forest areas," said the Gumla DFO, who is also in charge of Ranchi DFO. Most importantly, the movement of wild elephants is also monitored through drones so that the villagers living in those areas could be alerted and moved to safer places, he added.

Now we are on Telegram too. Follow us for updates

Drone pilots training institute to come up in Haryana

government.economictimes.indiatimes.com/news/technology/drone-pilots-training-institute-to-come-up-in-haryana/90858627



Exclusive

The institute is expected to cater to various training needs of personnel of DRIISHYA and other organizations too.

- <u>TNN</u>
- Updated: April 15, 2022, 11:07 IST



A training institute to train <u>drone</u> pilots under the aegis of Drone Imaging and Information Service of <u>Haryana</u> Limited (<u>DRIISHYA</u>) would be set up in the state in order to support capacity development. The institute is expected to cater to various training needs of personnel of DRIISHYA and other organizations too.

A decision in this regard was taken during the second Board of Directors meeting of DRIISHYA Chaired by Chief Minister, <u>Manohar Lal Khattar</u> held on Thursday.

The Chief Minister was apprised that Haryana is the first state to create a separate corporation to speed up the <u>Unmanned Aerial Vehicle</u> (UAV) driven governance application.

"This is a unique beginning in the State as now with the help of drones, illegal encroachments can also be controlled along with detecting expansion of area as earlier manual surveys were conducted at regular intervals which were very time consuming, costly and required more manpower," said Khattar.

Directing the officers concerned to ensure quick disposal of various types of surveys and imaging work, the Chief Minister said that besides Revenue Department, the use of drones should also be ensured in other departments like Urban Local Bodies, Power, Disaster Management, Mining, Forest, Traffic, Town and Country Planning, Agriculture, etc, as it would help in mapping, land records, disaster management and emergency services, development planning in the urban areas.

The Chief Minister was further apprised about the procurement of drones in various categories and different sensors. It was informed that on account of an embargo on the import of drones from abroad, there has been a delay in procurement.

Chief Secretary, Sanjeev Kaushal, Additional Chief Secretary, Power Department, PK Das, Principal Secretary, Urban Local Bodies Department, Arun Gupta, Principal Secretary to Chief Minister, V. Umashankar, Managing Director, Haryana State Industrial and Infrastructure Development Corporation, Vikas Gupta, CEO, Drone Imaging and Information Systems of Haryana Ltd. (DRIISHYA), TL Satyaprakash and other senior officers also remained present on this occasion. Additional Chief Secretary Chil Aviation Department, Sudhir Rajpal also attended the meeting through video conferencing. 🚹 Gmail

Aravalli Bachao <aravallibachao.team@gmail.com>

Tue, Aug 2, 2022 at 9:08 PM

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Using Drones to Protect Aravallis & Shivaliks

Aravalli Bachao <aravallibachao.team@gmail.com>

To: cmharyana@nic.in Cc: Dushyant Chautala <deputycmharyana@gmail.com>, anilvijcomplaints@gmail.com, "pccf-hry@nic.in <pccf-hry@nic.in>, Pspccf@gmail.com <Pspccf@gmail.com>,, papccf@gmail.com <papccf@gmail.com>,, pccfwlhry@gmail.com" <pccf-hry@nic.in>, dwloggn@gmail.com, cs@hry.nic.in, "T.L. Satyaprakash,IAS" <dcgrg@hry.nic.in>, Deputy Commissioner <dcfbd@hry.nic.in>, sudhirsinglaadv@gmail.com, rakesh@rakeshdaultabad.com, seematrikha.bjp@gmail.com, v.umashankar@gov.in, ceo.gmda@gov.in, cp.ggn@hry.nic.in, police@hry.nic.in, adgp.laworder@hry.nic.in, cp.fbd@hry.nic.in, dcnuh@hry.nic.in, adcnuh@hry.nic.in, spmwi@hry.nic.in, dcp.southggn@hry.nic.in, dmg_mines-hry@nic.in, acsmghry@gmail.com

Dear Mr. Khattar,

Greetings from the Aravalli Bachao Citizens Movement.

All the citizens living in Haryana and the rest of India have been extremely saddened by the cold blooded murder of DSP Surender Singh Bishnoi by those involved in illegal mining in the Nuh Aravallis. Recently, we held a prayer ceremony in the Aravalli forest in Gurugram to pay our tribute to DSP Bishnoi. This link has details:

https://www.cityspidey.com/news/18516/citizens-pay-tribute-to-officer-who-died-checking-illegal-mining-in-aravalli

To ensure that DSP Surender Singh's sacrifice does not go in vain, we urge you as our Chief Minister to direct the Haryana government authorities to use 'Advanced Drone Technology' and other latest technological tools for monitoring illegal sand and stone mining in the Aravallis and Shivaliks to bridge the gaps in the current surveillance and monitoring system. This would be the biggest tribute that the Haryana state can pay to the slain DSP.

Members of the Aravalli Bachao Citizens Movement have highlighted 16 locations of illegal stone and sand mining across Gurugram, Faridabad and Nuh Aravallis in 2021-22. The Honourable National Green Tribunal (NGT) in its order dated 23rd May 2022 in the matter of Aravalli Bachao Citizens Movement vs Union of India & Others (Original Application No.362/2022) observed: "The averments made in the petition raise substantial questions relating to adequacy and efficacy as well as failure of surveillance and monitoring mechanism evolved for preventing illegal mining and measures required to be taken for this purpose in the area and protecting the Aravalli range from further degradation in view of its immense ecological importance."

The attached PDF document titled Using Drones to Protect Aravallis & Shivaliks presents the case for why remote sensing with the use of Drones is one of the most effective and economical methods for real time assessment of ecologically sensitive zones like the Aravallis and the Shivaliks that require protection from illegal felling of trees, mining, encroachments etc. We urge the Haryana government authorities to undertake constant monitoring of mining activity using Drones with advanced cameras and night surveillance of mining activity should also be done using night-vision Drones as recommended by Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 of the Ministry of Forest, Environment and Climate Change.

There is a favourable environment for the use of Drone Technology in Haryana as Haryana is the first state to have created a separate corporation i.e. Drone Imaging and Information Service of Haryana Limited (DRIISHYA) to speed up Drone Driven Governance and as our CM, you are keen that Drones should be used by all government departments like mining, forest, urban local bodies, disaster management, power, traffic, town and country planning, agriculture, etc. The procurement of Drones for checking on illegal mining and other non-forest activities in the Aravalli and Shivalik hills and forests can easily be routed through DRIISHYA corporation.

Hoping that you and the government authorities do everything in your power to protect the Aravallis and Shivalik hills and forests as they are the lifeline for clean air and water for millions of people living in Haryana. Haryana state's water security is under huge threat with Aravalli hills disappearing as they have the potential to put 2 million litres of water per hectare in the ground every year. Aravallis are also a massive green lung and carbon sink for the state of Haryana which has the lowest forest cover in India, barely 3 percent and cities with the highest levels of air pollution.

We do not want our children dying gasping for breath and no water to drink.

Sincerely,

Jyoti Raghavan Managing Trustee, Aravalli Bachao Citizens Movement

Using Drones to Protect Aravallis & Shivaliks.pdf 368K

PROTECTING THE ARAVALLIS & SHIVALIKS BY USING DRONES

DESTRUCTION OF ARAVALLIS IS RESULTING IN DESERTIFICATION OF HARYANA

The Desertification and Land Degradation Atlas-2021, released by the Indian Space Research Organisation (ISRO) states that around 3.6 lakh hectares or 8.2% of the Haryana state's total land area had degraded and become more arid by 2018-19. Desertification occurs when fertile land turns into a desert by losing its flora and fauna. Experts attribute desertification in the state of Haryana to mining in the Aravallis which is leading to destruction of the Aravalli hills and loss of forests and green cover.

Aravallis have been a physical, natural barrier between the plains of northern India and the Thar desert and have helped to check the spread of the Thar Desert towards eastern Rajasthan, the Indo-Gangetic Plains, western Uttar Pradesh, Haryana and India's National Capital Region. With hill after hill being razed to the ground by mining across the Aravalli range and the resulting loss of vegetation and green cover, there are fewer obstacles to stop wind erosion. The latest ISRO report shows that desertification of Haryana's geographical area increased by 0.57% from 2011-13 to 2018-19. The report, based on satellite data, is released every seven years.

"The Aravalis are old metamorphic rocks. In geological terms, the rocks weather and sand gets deposited at the foothills. Water seeps into the ground with the help of this porous sand, recharging groundwater. If we take away the rocks and thereby the sand, it will directly impact the groundwater table and make the region dry. The degradation of the Aravalis is leading to an opening up of the mountain area, as a result of which dust and sand from Rajasthan is entering into the region. Mining has helped desertification. Temperatures will also rise as green cover declines," said Dr. Ranjana Ray Chaudhuri, Associate Professor of Hydrology at TERI.

Impacts of Desertification for the State of Haryana:

- 3.6 lakh hectares or 8.2% of the Haryana state's total land area that became degraded by 2018 has become uncultivable. This directly threatens food security in the state.
- Land degraded by desertification will not recharge groundwater and thus aggravate water scarcity problem in Haryana.

It may be noted that India is a signatory to the United Nations Convention on Combating Desertification (UNCCD). The country is committed to combat desertification and land degradation and intends to achieve land degradation neutral status by 2030. **Saving the Aravallis is critical for combating desertification**.

Reference: <u>https://timesofindia.indiatimes.com/city/gurgaon/march-of-desertification-8-of-haryanas-area-turned-arid-by-2018-19-says-report/articleshow/93283403.cms</u>

IILEGAL MINING IN HARYANA ARAVALLIS CONTINUES DESPITE SC BAN

Aravallis in Haryana have been ravaged by mining for many years. In 2009, the Supreme Court came to its rescue and banned all mining activity in the Haryana Aravallis in the 3 districts of Gurugram, Nuh and Faridabad. However, mining for stone and sand continues illegally in these areas. A Times of India article dated 2nd August 2022 has reported that state officials collected Rs 10 crore as penalties linked to illegal mining in the Aravallis of Gurugram and Nuh. According to the Haryana State Mines and Geology Department, there has been a more than four-fold rise in the cases of illegal mining registered across Haryana in the last three years (as stated in the Hindustan Times 31st July 2022 article titled 'Police to map all illegal mining sites in Nuh, Faridabad and Gurugram'.

Other Negative Impacts of Mining in Aravallis for People and Wildlife:

- Haryana state's water security is under huge threat with Aravalli hills disappearing as Aravallis with their natural cracks and fissures are the region's most critical water recharge zone. Aravallis have the potential to put 2 million litres of water per hectare in the ground every year. Central Ground Water Board 2017 report revealed that aquifers in the Aravallis are interconnected and any alterations in the pattern can disturb the groundwater tables. One of the ecologically very significant areas in the Aravallis in Haryana where illegal mining is happening is in the Bhood areas. These areas consists of sand dunes which are ecologically very sensitive. Due to their porous nature, they have high percolation level and serve as a vital groundwater recharge zone, especially for the excess water flowing down the rocky Aravalli slopes during the monsoon. Ground water tables in Haryana and NCR are rapidly going down and illegal mining activity is destroying the critical water recharge zone of South Haryana & NCR.
- Aravallis are a massive green lung and carbon sink for the state of Haryana which has the lowest forest cover in India, barely 3 percent and cities with the highest levels of air pollution. Mining activities result in deforestation which is reducing the pollution and carbon sink of this highly polluted region. The denudation of forests in the Aravallis coupled with climate change is also increasing the intensity of dust storms hitting Haryana and NCR. An increase in ozone precursors — carbon monoxide and nitrogen oxide — takes place after major dust events. Dust storms also increase PM 2.5 and PM 10 and harmful greenhouse gases at the surface adversely impacting the health of millions of people living in South Haryana and Delhi-NCR.
- Aravallis are also instrumental in shaping the climate of the north western region in India and the upper Indo-Gangetic plain. Destruction of the hills and forests due to mining is increasing the local temperatures and adversely impacting rainfall patterns in eastern Rajasthan, Haryana, and Delhi - NCR. Occurrence of normal rainfall in this region including Haryana is dependent on the preservation of the green forest cover of the Aravallis and the resultant normal evapo-transpiration process over the Aravalli hills.
- Wildlife that lives in the Aravallis: 200+ bird species, 100+ butterfly species, 20+ reptile species, 20+ mammal species including the leopard are under severe threat because of mining activities. Shrinking habitat in the Aravallis due to mining has forced wild animals to venture into areas outside the forest in search of food and water leading to more cases of man-animal conflict.

LEGAL FRAMEWORK FOR MONITORING ILLEGAL MINING IN INDIA

The existing monitoring mechanism for detecting illegal mining have failed to curtail the menace of illegal sand and stone mining across different states in India, which severely threatens the biodiversity and ecological balance of eco-sensitive zones such as the Aravallis. Several legal cases and court rulings have constantly reiterated the need to improve the implementation of existing guidelines for checking illegal mining and use latest technology for better reinforcement. Table 1 summarizes some of the most notable court orders that refer to the same.

Use of Advance Drone Technology is recommended by Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020:

By incorporating directions given in several court orders, the Ministry of Forest, Environment and Climate Change (MoEFCC) formulated its recent guidelines i.e Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 which recommend:

- Use of unmanned aerial vehicles (UAVs), also known as Drones, with advanced cameras to identify illegal sand mining hotspots.
- Constant monitoring of mining activity using Drones and night surveillance of mining activity to be done using night-vision Drones.

Section 5.2.2 of the EMGSM-2020 guidelines (Page 31-32) lays down in detail the instruments and software requirement for such monitoring.

A 30 January 2020 article in the Hindustan Times quoted a senior official from MoEFCC: "So far, information from remote zones where illegal sand mining has been reported lacks groundtruthing. Along with physical surveys, the advent of advanced technology in the form of Drones needs to be used by states to have a topographic overview and provide information accuracy to curb illegal sand mining. The latest guidelines are an amalgamation of all previous guidelines and court directions issued over the years."

Reference: <u>https://www.hindustantimes.com/mumbai-news/use-camera-drones-to-curb-illegal-sand-mining-identify-erosion-union-environment-ministry/story-S6sLaDXBakUawCLL8iHMPL.html</u>

The Honourable National Green Tribunal (NGT) in its order dated 23rd May 2022 in the matter of Aravalli Bachao Citizens Movement vs Union of India & Others (Original Application No.362/2022) observed: "The averments made in the petition raise substantial questions relating to adequacy and efficacy as well as failure of surveillance and monitoring mechanism evolved for preventing illegal mining and measures required to be taken for this purpose in the area and protecting the Aravalli range from further degradation in view of its immense ecological importance."¹

Government of Haryana should follow the EMGSM-2020 guidelines and various court orders and use Advanced Drone Technology and other tools for monitoring and stopping illegal stone and sand mining in the Aravallis and checking other non-forest activities in the Aravallis as well as the Shivaliks.

¹ See Paragraph 4, NGT Ruling (Original Application No.362/2022); Delivered on 23.05.22) Aravalli Bachao Citizens Movement

SI No.	Petitions in NGT	Date of orders	Relevant orders
1	OA No. 173 of 2018 Sudarsan Das Vs. State of West Bengal & Ors.	04.09.2018	NGT directed MoEFCC to revise the Sustainable Sand Mining and Management Guidelines 2016 due to persistent gaps in monitoring illegal sand mining from river beds by the
2	OA No. 44 of 2016 Mushtakeem Vs MoEF & CC and Ors.	05.09.2018	states. Court directed for a dedicated monitoring mechanism to be set up. The order mentioned the Mining Surveillance System (MSS) developed by the Ministry of Mines & Indian Bureau of Mines. MSS is a satellite- based monitoring system which aims to curb instances of illegal mining activity through automatic remote sensing detection technology.
3	OA 360/2015 National Green Tribunal Bar Association Applicant(s) Versus Virender Singh (State of Gujarat)	05.04. 2019	State government directed to set up effective monitoring mechanism for preventive and remedial measures including surveillance system and recovery of compensation.
4	O.A. No. 40/2020/ EZ Pawan Kumar Vs. State of Bihar & Ors.	14.10.2020	Court directed that in preparation of DSR, the procedure and the parameters laid down under the Sustainable Sand Mining Management Guidelines (SSMMG) 2016 and Enforcement and Monitoring Guidelines for Sand Mining (EMGSM) 2020 will be read in sync with each other and followed. In case of any ambiguity or variation between the provisions of these documents, the provision made of the "EMGSM-2020" shall prevail.
5	OA 169/2020 Kuldeep Singh Versus State of Haryana & Others	18.01.2022	NGT order stated that Advance Technological Drones should be provided to the Haryana State Mining Department to take prompt action against illegal mining activity.

Table 1: Court Orders related to Monitoring of Illegal Mining using Technology

BENEFITS OF USING DRONE TECHNOLOGY

Timely action can only be taken with proper planning and to plan properly one must have access to relevant data. The current methods of data collection for illegal activities in the forests such as illegal mining, encroachments etc are labour intensive, cost inefficient, time consuming and pose a high degree risk to the officials visiting the locations.

Unmanned Aerial Vehicles (UAVs), better known as Drones, are emerging as the perfect tool to document and control illegal activities in the forests globally. These multi rotor flying machines can be remotely controlled via a laptop or even the satellite and are the perfect ride for advanced cameras and sensors. They may even be pre-programmed not only to take off and land at the same position but also to follow a pre-set flight path. Using Drones, government authorities and conservationists can record useful data, capture aerial images and map vast, remote areas like the Aravalli hills & forests to get a better understanding of the topography and ongoing illegal mining, encroachments and other illegal activities.

Using Drones is both cheaper and faster than any existing method. Remote sensing using Drones has a range of benefits such as reduced costs, flexibility in time and space, high accuracy data and the advantage of no human risks. There is increasing interest in this segment of technology, especially due to the high-resolution data that can be collected flexibly in a short time and at a relatively low price.

Various dimensions of usefulness of Drones are summarized below:

- 1. Since drones can get closer to the surface, they can also reach different angles and perform other measurements like 3D terrain modelling and geomorphology and can help check amount of erosion, presence of trees etc.
- 2. Sensors can measure light, sound, and radiation. Any increased machine-based mining activity can be sensed by Drones.
- 3. If vehicles are provided with RFID tags/ GPS, Drones can track their movement.
- 4. As compared to Satellites, Drones can capture images at a higher resolution and also in real time/on demand (as compared to reliance on visit frequency of satellites).
- 5. Given their small size, Drones are very effective in monitoring nefarious activities as they are difficult to detect.
- 6. Data collected using Drone technology is accurate and more reliable than prevalent manual methods.
- 7. Drones can reach remote areas to collect data or images and they are quite versatile fliers adept at avoiding obstacles in their flight path.
- 8. When equipped with particle sensors, Drones are useful for detecting the emission of particulates. Concentrations and emission rates of sulfur oxides, nitrogen oxides, and ammonia can be measured so any waste dumping, waste burning can be measured.

DRONES ARE BEING USED FOR FOREST PROTECTION GLOBALLY

Drones have replaced the use of Satellites in measuring parameters such as canopy height, canopy cover, number of trees, volume estimation, etc. that are important parameters in sustainable forest management. Especially the evolution of LIDAR technology mounted on UAVs mean images can be obtained with very high resolution and in nearly infra-red conditions. Studies have shown that the use of Drones does not lead to significantly different results compared to data from the most high-end Satellites while taking significantly lesser time and cost. Also, small gaps in forests that cannot be detected by Satellites can be detected by Drones. For best results, flights should be made at low altitudes and under low cloud cover conditions, without direct sunlight, in order to get very good images.

Globally, many countries have adopted Drones to protect their forests. For example, Thailand is using Drones to prevent deforestation. Panama's indigenous tribes have also turned to Drones to protect their homes. Drones have proven helpful for them in monitoring areas where manpower is limited and the rainforest is vast.

Reference: https://www.geospatialworld.net/blogs/gis-using-drones-to-protect-forests/

USE OF DRONES FOR FOREST CONSERVATION AND PROTECTION IN INDIA

While initially the use of Drones in India was for defence purposes, they are now being used in commercial applications and by various government departments at both the state and the the central level. A report by Drone Federation of India (DFI) stated in 2020 that Drones are been used in India to monitor wildlife, prevent illegal activities in forests, mining, disaster management, urban planning, agricultural assessments, surveillance and security.

Reference: <u>https://newhorizonindia.edu/nhengineering/future-of-drones-uses-applications-and-advancements/</u>

<u>Jharkhand</u>

Drones are being used by the forest department in Jharkhand for monitoring forest growth, tracking movement of wildlife and checking forest fires. In addition, Drones have also proved to be helpful in monitoring the legal mining done in the forest areas and checking illegal mining, and helps monitor the actual reclamation done by the mining companies after mining is completed in particular areas.

Reference: <u>https://www.newindianexpress.com/nation/2022/jun/09/jharkhand-forest-officials-use-drones-to-monitor-movement-of-wild-tuskers-check-forest-fires-2463576.html</u>

Madhya Pradesh

Panna Tiger Reserve operates a "Drone Squad" for detecting, locating and informing about wildlife fires, rescue and search of wildlife, avoiding the risk of potential human-animal conflict and ensuring compliance with wildlife conservation laws.

<u>Gujarat</u>

The Drone Surveillance Project was initiated in 2018 by the former Gujarat Chief Minister Vijay Rupani to keep an eye on illegal sand mining in rivers like Sabarmati. The project led to a 144 per cent increase in penalties recovered from individuals involved in illegal mining activities in Gujarat since 2018, according to the Commissioner of Geology. During the four-year period (2017-21), the number of illegal mining cases was reduced by 8.5 per cent in Gujarat. A total of over 30,146 illegal mining cases were registered across Gujarat during the same period. The Mining Surveillance System uses space technology for curbing illegal mining activities was developed in the country through the Indian Bureau of Mines by the Union Ministry of Mines. The project has been discontinued as of January 2021 according to news reports. In the HT article dated 16th January 2022, the Commissioner of Geology is quoted as saying that the project will be restarted soon.

Reference: <u>https://www.vibesofindia.com/gujarat-drone-surveillance-project-to-put-halt-on-illegal-mining-discontinued/</u>

Other states such as Tamil Nadu, Bihar, UP and Punjab have also announced plans to use Drones for monitoring and stopping illegal mining.

<u>Maharashtra</u>

Maharashtra Forest Department, has been using Drones for monitoring poaching activities, and keeping a close-watch on tree felling, encroachment and illegal country liquor production. The Economic Times reported, "1,500 litres of illegally produced alcohol in barrels and tin containers have been destroyed along 25 encroachments at Yeoor during lockdown."

Reference: https://tropogo.com/blogs/drones-for-wildlife-conservation-india

<u>Assam</u>

Assam has decided to use Drones to survey and check the authenticity of tree plantation drives and other similar programs in the state under Compensatory Afforestation Fund Management and Planning Authority (CAMPA) and other biodiversity projects. Assam Chief Minister Himanta Biswa Sarma stressed on the need to use technology to monitor the reforestation drive under the Assam Project for Forest and Biodiversity Conservation (APFBC) for quantifying the performance. "There is a need to increase the use of technology, like satellite imaging to save species. This will also help check deforestation and the land under forest cover," Sarma was quoted as saying.

Reference: https://www.geospatialworld.net/blogs/gis-using-drones-to-protect-forests/

FAVOURABLE ENVIRONMENT FOR USE OF DRONE TECHNOLOGY IN HARYANA

Haryana is the first state to create a separate corporation to speed up the Unmanned Aerial Vehicle (UAV) or Drone Driven Governance. The Drone Imaging and Information Service of Haryana Limited (DRIISHYA) will help undertake aerial surveys, imaging and mapping to facilitate decision support activities for various organs of the government. It will acquire, manage, operate and maintain Drones and Unmanned Aerial Vehicles (UAVs) as imaging and information collection platforms with sensors of various kinds. It is also setting up a training institute to train Drone pilots. The procurement of Drones for checking on illegal mining and other illegal activities in the Aravalli and Shivalik hills and forests can easily be routed through this corporation.

"This is a unique beginning in the state as now with the help of Drones, illegal encroachments can also be controlled along with detecting expansion of area as earlier manual surveys were conducted at regular intervals which were very time consuming, costly and required more manpower," said Haryana's Chief Minister Mr. Manohar Lal Khattar, quoted in the 15th April 2022 India Times news article. **Mr. Khattar said that besides the Revenue Department, the use of Drones should also be ensured by other departments like Mining, Forest, Urban Local Bodies, Disaster Management, Power, Traffic, Town and Country Planning, Agriculture, etc.**

Reference: <u>https://government.economictimes.indiatimes.com/news/technology/drone-pilots-</u> <u>training-institute-to-come-up-in-haryana/90858627</u>

The Haryana State Forest Department had initiated and piloted a Drone program in 2018 and spent Rs 20 lakh to procure two Drones. While the basic drone was to carry out survey, the industrial drone could be embedded with various sensors, including the thermal sensor, to spot any crime against wildlife or non-forest activity like cutting trees, building roads, illegal mining and encroachments, in real time. This drone was fitted with an optical sensor of 43 megapixels and a camera and could fly up to 250 metres at a speed of more than 60 metres per hour. Both the Drones were equipped with night-vision cameras and were tested successfully in the Bandhwari region of the Aravallis.

"These Drones will help in gathering data of forest health, encroachments, the presence of wildlife to prepare management plans and developing decision support. The Drones can take several pictures and videos that are better than satellite images and thus can be used for making a 3D model of the area," stated Vinod Kumar, Chief Conservator of Forests (Wildlife), Gurugram circle in the TOI article dated 5th May 2018.

Initially a private company was helping to operate these Drones but after the formation of DRIISHYA, the forest department has handed over the 2 Drones to the corporation. Going forward, DRIISHYA can act as a nodal agency to coordinate Drone flying permits for various departments, i.e. forest department, police and mining department, for the purposes of tracking illegal mining and other illegal activities in the Aravallis and the Shivalik hills and forests.

Reference: <u>https://timesofindia.indiatimes.com/city/gurgaon/haryana-deploys-two-drones-to-</u>watch-aravalis/articleshow/64035933.cms

CITIZENS ASKS FROM THE HARYANA GOVERNMENT

In order to effectively track and take action against those involved in illegal mining, encroachments and other illegal activities in the Aravalli and Shivalik hills and forests, law enforcement authorities and forest department must be assisted by the latest tools and technologies. Remote Sensing with the use of Drones/Unmanned Aerial Vehicles (UAVs) and other such technologies is the most economical and latest method for real time assessment of ecologically sensitive zones that require protection from illegal mining and other non-forest activities.

We urge the Haryana government authorities to use 'Advanced Drone Technology' and other latest tools for monitoring illegal sand and stone mining in the Aravallis and Shivaliks to bridge gaps in the current surveillance and monitoring system and to prevent and apprehend the perpetrators of illegal felling of trees, encroachments and other non-forest activities.

We are hopeful that the Joint Task Force set up to investigate illegal mining in the Aravalli Bachao Citizens Movement vs Union of India & Others (Original Application No.362/2022) will be the starting point for greater collaboration and cooperation between various government departments in Haryana to control the menace of illegal mining and help design and enforce a robust, technology enabled system to preserve the eco sensitive region of Aravallis.

In **T.N. Godavarman Thirumulpad Vs. Union of India, (2022) 4 SCC 289 (3 J)** it was held at in paras "32.....engagement, inclusion and participation of citizens and perhaps more significantly, the ownership of the sustainable development agenda by empowered citizens and community level actors will contribute in a significant manner to achieving the economic, social and environmental pillars of the sustainable development agenda. 33. Citizens, as the ultimate beneficiaries of development, have a critical role to play, not just in terms of effort and action towards the achievement of the environmental goals but also in terms of the associated monitoring of the progress towards these goals."

Some extra information on classification of Drones based on different parameters, types of payloads and their applications and expected trends in Drone Technology are given in the next few pages.

EXTRA INFORMATION ON DRONES

CLASSIFICATION OF DIFFERENT TYPES OF DRONES

According to Take-Off and Landing Type:

- a) Fixed Wing Drones:
 - These take-off and land horizontally
 - Has the advantage of higher coverage areas per flight
 - Can fly faster
- b) Rotary-wing drones (multi-rotor systems):
 - These take-off and land vertically (like helicopters, quadcopters)
 - Has the advantage of better stability which gives a higher spatial resolution, but with reduced coverage area
 - Make less noise, don't require landing strip
- c) Other/Hybrid systems:
 - Hybrid systems have characteristics of both multi-rotor and fixed-wing systems
 e.g. hybrid quadcopter which uses multiple rotors to take-off and land vertically
 but also has wings so it can fly longer distances.
 - Some drones have neither fixed-wing nor multirotor systems, e.g. ornithopter which flies by mimicking wing motions of insects or birds. They are mostly still under development and are not widely used in practice.

According to Level of Autonomy

The United States Department of Defence distinguishes four levels of autonomy in their roadmap for unmanned systems.

- a) Level 1 Human operated system: The most basic level of autonomy is when a human operator makes all the decisions regarding drone operation. This system does not have any autonomous control over its environment.
- b) Level 2 Human delegated system: This system can perform many functions independent of human control. It can perform tasks when delegated to do so, without further human input. Examples are engine controls, automatic controls, and other automation that must be activated or deactivated by a human controller.
- c) Level 3 Human supervised system: This system can perform various tasks when it is given certain permissions and directions by a human. Both the system itself and the supervisor can initiate actions based on sensed data. However, the system can only initiate these actions within the scope of the current task.
- d) Level 4 Fully autonomous system: This system receives commands input by a human and translates these commands in specific tasks without further human interaction. In case of an emergency, a human operator can interfere with these tasks.

According to Size and Weight

- a) Large drones
 - Fixed wing drones between 20 and 150 kg and multi- rotor drones between 25 and 100 kg.
 - Small drones are fixed-wing drones up to 20 kg and multi-rotor drones up to 25 kg.
 - Mini drones can vary in weight from several grams up to several kilograms. These mini drones are mainly suitable for indoor applications and recreational applications.

According to Energy Source

- a) Battery operated
 - Battery cells are mainly used in smaller multirotor drones. These drones are short range and require less operating time than drones using kerosene
- b) Airplane fuel (kerosene)
 - Mainly used in large fixed-wing drones with internal combustion engines.
 - An example of such a drone is the military Predator drone. This drone is used a lot by the US army and can be equipped with a number of different sensors, but also with rockets and other types of ammunition
- c) Fuel cell
 - Fuel cells are currently rarely used in drones. Only fixed-wing drones can be equipped with such a cell because of the cell's relatively high weight.
 - A major advantage of using a fuel cell is the fact that drones can fly longer distances without recharging. For example, the Stalker drone which uses a fuel cell has a flight time of 8 h instead of 2
- d) Solar cells
 - At current levels of solar efficiency these are only suitable for very small drones
 - These attracted a lot of media attention when both Google and Facebook struck deals with manufacturers of these drones. Their goal was to let solar-powered drones fly in the atmosphere permanently in order to enable people to connect to the Internet more easily and massively.

TYPES OF PAYLOADS AND THEIR APPLICATIONS

This section will discuss the types of payloads that can be attached to drones. Virtually all kinds of payloads can be attached to drones, the only restrictions are usually the weight and size of payloads. Payloads can be customized by manufacturer or attached separately by the user. Broadly payloads can be divided into two categories – Sensors (that collect data) and Cargo (physical items that can be distributed using drones). We will focus on the first category which is more relevant for remote sensing activities.

Sensors as Payloads in Drones

- Most drones are nowadays equipped with cameras/microphones. Cameras can be regular cameras but also infrared/ night vision. Cameras can be useful payloads for surveillance. The preventive function of camera surveillance, including drones, will probably be very limited when there are not at least a substantial number of drones in the sky. Reviewing images from drone cameras may yield useful information for tracing and arresting suspects, for excluding potential suspects, identifying witnesses, finding missing persons, reconstructing incidents, etc. Drones may also be useful for forensics, since drones can be used to investigate crime scenes without stepping on valuable traces.
- Law enforcement applications for drones may also include other sensors such as biological sensors that can trace microorganisms, chemical sensors ('sniffers') that can measure chemical compositions and traces of particular chemical substances including radioactive particles and meteorological sensors that can measure wind, temperature, humidity, etc.
- Drones equipped with WiFi hotspots may provide clues about someone's position and can be used for tapping phone and Internet use.

Camera sensors can operate via three mechanisms

- **Non-active systems**, in which drones act as a visual deterrent by using fake cameras to create the illusion of surveillance without actual monitoring or storage,
- **Reactive systems**, which have recording, storage and playback facilities for footage of incidents after an event has occurred, and
- **Proactive systems** with live surveillance from a dedicated control room with recording, storage and playback facilities, allowing for an immediate response to incidents as they occur.

EXPECTED TRENDS IN DRONE TECHNOLOGY

Over the next five years, trends in drone technology will be observed in four general categories:

Miniaturization

Size of drones will *continue to decrease* while maintaining and/or increasing capabilities. New materials and lighter and more efficient batteries create better trade-offs between the drone and its flight range, maximum altitude, and maximum payload. The limits of miniaturization are unknown. The smallest commercially available drones are more or less the size of credit cards, but experts indicate that within a few years we can expect drones the size of insects.

Platform Operation

Speed capabilities for rotocopters could surpass 200 mph; **range and endurance** will improve steadily. Most commercial electronic and mechanical capabilities available for other mobile platforms will become available for drone sensors within the next five years (robotics, sensors, audio/video, etc.).

Autonomy

The degree of autonomy, and the level of sophistication of communication between units, will continue to expand, allowing drones to perform any functionally programmable operation. In the near future, more autonomy is expected with regard to determining flight routes, sense and avoid systems for performing evasive manoeuvers (e.g. birds, airplanes), adapting to changing weather conditions and defensive reactions when drones are under attack.

Swarming

The increasing autonomy of drones enables the cooperation between drones in so-called swarms. The use of swarms may widen the range, flight duration, and maximum payload for particular applications. For instance, using drones in swarms, one drone may take over a task from another drone with an exhausted battery. In this way, the flight range can be extended beyond the range of the first drone. Drones that fly beyond the reach of control signals or are damaged during their flight can be replaced by other drones. Heavy payloads may in some cases be distributed over several drones, exceeding the payload of only one drone.

Swarms of drones may be used as sensor networks. When drones are used to follow several persons, a problem may arise when they split up. When using swarms, each drone may follow an individual instead of having to choose whom to follow.