BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH NEW DELHI

OA No. 187/2023

Shailandra Kumar Yadav — Applicant

Versus

State of H.P. — Respondent

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Date : 20.04.2025

Place : Theog

Respondent

Divisional Forest Officer
Theog Forest Division, Theog

Through

Divyanshu

Divyanshu Kumar Srivastava
48, Lawyers' Chamber, Supreme Court of India
Tilak Marg, New Delhi 110001

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OA No. 187/2023

Shailandra Kumar Yadav
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Report in compliance to the order dated 13-02-2025 passed in above titled OA

Respectfully submitted –

1. That this Hon'ble Tribunal on 13-02-2025 passed the following order –

"**4**. *In the above report, it has been disclosed that the two options are available to dispose of the horse dung generated in the Kufri Track in question.*

5. *Learned Counsel appearing for the State has submitted that out of the two options, firstly, composting the horse dung and, secondly disposal by briquetting the horse dung, it has been found that the first option of composting is cheaper and is acceptable.*

6. *We find no detailed plan for composting has been placed on record which would take into account the total quantity of generation of horse dung, its collection point, feasibility of its transportation to the pits where composting is to be done, the manner of transportation and the*

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Vikram Verma

transportation cost, the availability of land for composting pit, the design of composting pit and also the time which will be taken for composting and extent and number of composting pits which are required considering the horse dung generated per day and the number of days which will be taken for compositing and also the manner of disposal of compost, the entities who will be using/buying the compost, their requirement and if the entire compost will be utilized and the overall fixed as well as working cost if the project. It has been candidly admitted that no cost analysis has been done. Therefore, we find that the cheaper option cannot ascertained unless the cost analysis is done and detailed plans for both the options are examined, by taking into account not only the short term cost, but the cost benefit analysis in the long run.

7. *The DFO, Theog appearing virtually has submitted that now this exercise will be done and a detailed plan will be placed before the Tribunal. The DFO, Theog has stated that he is the deciding authority on the above aspects.*

Under esteemed directions of the Hon'ble Bench, the Forest Department has assessed that quantity of horse-dung that will generate during the whole year would be 400 to 500 metric tonnes. This assessment was based on the number of trips plied by horses from February 2024 to December 2024. During the process of manuring and vermi-composting, the horse-dung reduces in weight by 50% and annually 200 to 250 metric tonnes of horse-dung would be available for use in the nurseries.

There are five number of forest nurseries in the vicinity of Kufri with the forest department and there is annual requirement of 180-270 metric tonnes of manure as given in the following table –

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S. No.	Nursery	Distance from Kufri (km)	Plants available	Quantity of horse dung to be consumed (Metric Tonnes)
1.	Sainj	20	7 lacs	80-120
2.	Nahol	30	2 lacs	30-40
3.	Reoghatti	50	1 lac	20-35
4.	Dhanain	15	2 lacs	30-40
5.	Thachi	35	1 lac	20-35
				180-270

All the nurseries mentioned in the above table are linked with metalled road. The required horse-dung manure would be carried to these nurseries using carrier vehicles.

At present, the horse dung is being collected in Kufri and it is transported for manuring in pits to the forest area 2 km from Kufri. The horse-dung is being collected in the pit of size 5 x 5 x 2 m. Two additional pits, each of size 3 x 3 x 2 m have been dug adjacent to the first pit. The horse-dung is being subsequently transferred from the first pit into the second and then into the third pit. During this process the horse dung was manured for 45 days, subsequently 54 Qtls of manured horse dung was transferred to the Sainj Nursery on 8-3-2025 for vermicomposting located 20 km from Kufri.

In Sainj Nursery there are 13 vermi-composting pits with covered roofs. Each pit is having dimension of 3 x 3 x 1 m that can process the 50 Qtl of animal matter alongwith dry-leaves/grass (**Annexure R I**).

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Initially, two pits have been allocated for vermicomposting of the 54 Qtl of horse dung and the third pit was used as a ***control*** (using cow-dung). The first pit is being used for vermicomposting 100% of horse dung i.e. 35 Qtl; the second pit is vermicomposting the equal ratios of horse-dung and cow-dung (50:50), i.e. 19 Qtl horse-dung and 19 Qtl cow-dung. The third pit is being used for vermicomposting 100% of cow-dung i.e. 35 Qtl.

The vermi-composting of horse-dung is under progress and the outcome of vermi-composting of horse-dung would take another one month.

Therefore, it prayed before the Hon'ble Bench that in current circumstances due to lack of data of vermi-composting, cost-benefit ratio in comparison with the briquettes may allowed to be submitted after the vermi-composting gets completed.

10. *In the next report, the DFO, Theog will clearly disclose the carrying capacity of Kufri in reference to the horses and tourists. Let fresh report be filed by the DFO, Theog within 8 weeks.*

11. *List on 22.04.2025."*

Physical, Real and Effective Carrying Capacity was assessed both in reference to the horses and tourists using the Cifuentes' methodology (Cifuentes, 1992) that was adapted to specific bio-physical peculiarities and characteristics of the area, as well as the study by Kusumoarto and Ernawati (2017) pertaining to the "*Ecological carrying capacity analysis of ecotourism objects in Salak II resort area, Halimun Salak National Park).*

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Biotic impact on the Kufri-Mahasu region is determined by two categories viz. the horses and the visitors. Horses carry visitors on the trail that lead from Kufri to Mahasu. Visitors use horse-trail as well as alternate trail to approach Mahasu Peak on foot or on vehicles.

The carrying capacity was determined for the horse-trail (**Annexure R II**) that can accommodate the given number of horses was based on the correction factors that limit the movement of horses viz. number of cloudy days, slope of the track and ease of accessibility. Finally, the effective carrying capacity horses on the horse-trail was determined to be 580 depending upon the availability of the staff that handles the incoming traffic of horses.

The carrying capacity of the visitors (**Annexure R III**) was determined by the correction factors that limit the ease of movement on the area available on the Mahasu Peak viz. number of cloudy days, slope of the area, ease of accessibility and the area for movement. The effective carrying capacity of visitors at Mahasu Peak was determined to be 14109 based on the available staff that manages the visitor inflow.

That in view of the above, it is submitted that the present report may kindly be taken on record.

Manish Rampal, HPFS
Divisional Forest Officer
Theog Forest Division, Theog

ATTESTED
Oath Commissioner
Vikram Verma

Divisional Forest Officer
Theog Forest Division, Theog

OATH COMMISSIONER Vikram Verma

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AFFIDAVIT IN SUPPORT OF CLAIM REPORT

I, Manish Rampal, HPFS s/o Sh. BK Rampal, aged, 54 years presently posted as Divisional Forest Officer, Theog Forest Division, Theog do hereby solemnly affirm and declare on oath as under

That the accompanying report in compliance to the order dated 13-02-2025 passed in above titled OA has been drafted and prepared at my instance and under instruction. That the contents of para 1 to 7 are true and correct to the best of my knowledge and belief and as per the information derived from the official record.

I, the above named deponent further verify that the contents of my above report are true and correct to my knowledge. No part of it is false and nothing material has been concealed therefrom.

Verified at Theog on this 20th day of April 2025.

ATTESTED
Oath Commissioner
Vikram Verma

Divisional Forest Officer
Theog Forest Division, Theog

_____Deponent

_____Through Ld. Counsel

ANNEXURE I

PIT SIZE OF 5 X 5 X 2 m FILLED WITH HORSE DUNG

ANNEXURE I

TWO PITS EACH WITH SIZE 3 X 3 X 2 m FOR SUBSEQUENT SHIFING OF HORSE DUNG FROM THE PIT MEASURING 5 X 5 X 2 m

ANNEXURE II


COW DUNG (100%)
HORSE DUNG (50%) COW DUNG (50%)
HORSE DUNG (100%)

ANNEXURE R-III

ASSESSMENT OF CARRYING CAPACITY OF HORSES ON THE KUFRI – MAHASU TRAIL

(A) Assessment of the **Physical Carrying Capacity (PCC)** of the horse-trail from Kufri to Mahasu using the Cifuentes formula

S. No.	PARTICULARS	DETAIL
1.	Effective area of horse trail from Kufri to Mahasu Peak	5419 m^2
2.	Area used by one horse per sq. m	3x3 = 9 m^2
3.	Rotation factor (RF)	8/1.5 hours

PCC = A x V/a x Rf

PCC = Physical Carrying Capacity (Maximum number of visits that can be carried out in one day)

Suitable tourism Area(A) = Effective Area of the horse trail from Kufri to Mahasu = 5419 m^2

Visitor/Area (V/a) = Area needed by the horse to travel conveniently = 1/9 m^2

Rf = Rotation factor = 8/1.5 hours

$$PCC = 5419x\frac{1}{9}x\frac{8}{1.5}$$

PCC = 3211 horses

(B) Assessment of **Real Carrying Capacity (RCC)** of the horse-trail from Kufri to Mahasu

RCC = PCC x CF_1% x CF_2% x CF_3%

RCC = Real Carrying Capacity (Maximum number of horses that can travel on the horse trail from Kufri to Mahasu Peak, based on correction factors according to the local biophysical characteristics)

CF_1 (Correction Factor 1) = Cloudy/over-cast days correction factor

CF_2 (Correction Factor 2) = Slope correction factor

CF_3 (Correction Factor 3) = Accessibility correction factor

i.) CF_1 (Cloud overcast correction factor) = Data based on the average of **25 years** w.e.f 2000 to 2024 received from regional office of IMD at Shimla

Table 1: Number of rainy/overcast days for the past 25 years

S. No.	Month	Overcast days
1.	January	6.68
2.	February	7.08
3.	March	9.08
4.	April	8.0
5.	May	10.36
6.	June	14.76
7.	July	22.76
8.	August	23.04
9.	September	13.32
10.	October	3.36
11.	November	2.08
12.	December	3.24
	Average	**10.31**

$$CF_1\% = \frac{100 - CF_1}{100} = \frac{100 - 10.31}{100} = 0.8969$$

ii.) **CF_2 (Slope level correction factor)**

Table 2: Slope level correction data

S. No.	Slopes	Category	Assessment criteria
1.	0 - 8%	Level	20
2.	8 - 15%	Sloping	40
3.	15 - 30%	Rather steep	60
4.	30 - 40%	Steep	80
5.	> 40%	Very steep	100

Altitude of Kufri = 2622m (above mean sea level)

Altitude of Mahasu Peak = 2729m (above mean sea level)

Gain in altitude = 2729 – 2622 = 107m

Length of the horse-trail = 1082m

$$\text{Slope} = \frac{107}{1082} \times 100 = 9.889 \text{ or } 10\%$$

Slope along the horse-trail from Kufri to Mahasu Peak = 10%

$CF_2 = 40$

$$CF_2\% = \frac{100 - CF_2}{100} = \frac{100-40}{100} = 0.60$$

iii.) **CF_3 (Accessibility correction factor)** 200 m is the threshold limit required for convenient movement

Table 4: Accessibility correction factor

S. No.	Accessibility	Distance (meters)	Accessibility correction factor
1.	Horse-trail from Kufri to Mahasu Peak	1082	8.82

$$CF_3 = \frac{1082-200}{100} = \frac{882}{100} = 8.82$$

$$CF_3\% = \frac{100 - CF_3}{100} = \frac{100-8.82}{100} = 0.9118$$

Table 5: Determinants for calculation of Real Carrying Capacity (RCC)

S. No.	Particulars	Detail
1.	PCC	3211
2.	$CF_1\%$	0.8969
3.	$CF_2\%$	0.6000
4.	$CF_3\%$	0.9118

Real Carrying Capacity (RCC)

RCC = PCC x $CF_1\%$ x $CF_2\%$ x $CF_3\%$

= 3211 x 0.8969 x 0.6000 x 0.9118

= 1756.67 or say 1757 horses

(C) Assessment of the **Effective Carrying Capacity (ECC)** of the horse trail from Kufri to Mahasu

ECC = RCC x MC

RCC (Real Carrying Capacity)

MC (Management Capacity)

$$MC = \frac{R_n}{R_t}$$

R_n = Number of existing Management Officers
= 5

R_t = Number of required Management Officers
= 15

$$MC = \frac{5}{15}$$

MC = 0.33

ECC = RCC x MC, where

RCC = 1757 and MC = 0.33

And hence ECC = 1757 x 0.33

ECC = 579.81 or **580 horses**

Manish Rampal, HPFS
Divisional Forest Officer
Theog Forest Division, Theog

ANNEXURE R-IV

ASSESSMENT OF CARRYING CAPACITY OF VISITORS AT THE MAHASU PEAK

Assessment of the **Physical Carrying Capacity (PCC)** of the tourists at the Mahasu Peak using the Cifuentes formula

S. No.	PARTICULARS	DETAIL
1.	Effective area of Mahasu Peak	27900 m^2
2.	Area used by one tourist per sq. m	1.56 x x1.56 = 2.4436 m^2
3.	Rotation factor (RF)	8/1.5 hours

(A) Physical Carrying Capacity (PCC)

PCC = A x V/a x Rf

PCC = Physical Carrying Capacity (Maximum number of visits that can be carried out in one day)

Suitable area (A) = Area available for tourist activities at Mahasu Peak

Visitor/Area (V/a) = Area needed by the tourists for tourist activities conveniently

Rf = Rotation factor

$$PCC = 27900x \frac{1}{2.4436} x \frac{8}{1.5}$$

PCC = 60894

(B) Real Carrying Capacity (RCC)

$RCC = PCC \times CF_1\% \times CF_2\% \times CF_3\% \times CF_4\%$

RCC = Real Carrying Capacity (Maximum number of tourists that can be accommodated on Mahasu Peak, based on correction factors according to the local biophysical characteristics)

CF_1 (Correction Factor 1) = Cloudy over-cast correction factor

CF_2 (Correction Factor 2) = Slope correction factor

CF_3 (Correction Factor 3) = Accessibility correction factor

CF_4 (Correction Factor 4) = Activity correction factor

i.) **CF_1 (Cloud overcast Correction factor)** = Data based on the average of 25 years w.e.f 2000 to 2024 received from regional office of IMD at Shimla

Table 2: Number of rainy/overcast days for the past 25 years

S. No.	Month	Overcast days
i.)	January	6.68
ii.)	February	7.08
iii.)	March	9.08
iv.)	April	8.0
v.)	May	10.36
vi.)	June	14.76
vii.)	July	22.76
viii.)	August	23.04
ix.)	September	13.32
x.)	October	3.36
xi.)	November	2.08
xii.)	December	3.24
	Average	**10.31**

$$CF_1\% = \frac{100 - CF_1}{100} = \frac{100 - 10.31}{100} = 0.8969$$

ii.) **CF_2 (Slope level correction factor)**

Table 3: Slope factor correction data

S. No.	Slopes	Category	Assessment criteria
6.	0 - 8%	Level	20
7.	8 - 15%	Sloping	40
8.	15 - 30%	Rather steep	60
9.	> 40%	Very steep	100

Altitude of Mahasu Peak 1 = 2729 m (above mean sea level)

Altitude of Mahasu Peak 2 = 2714 m (above mean sea level)

Gain in altitude = 2729 – 2714 = 15 m

Length of the horse-trail = 402 m

$$\text{Slope} = \frac{15}{402}\ x\ 100 = 3.73\%$$

Slope at Mahasu Peak = 3.73%

CF_2 as per Table 3 = 20

$$CF_2\% = \frac{100 - CF_2}{100} = 0.80$$

iv.) **CF_3 (Accessibility correction factor)** 200 m is the threshold limit required for convenient movement

Table 4: Accessibility correction factor

S. No.	Accessibility	Distance (meters)	Accessibility correction factor
1.	Activity area of Mahasu Peak for visiting tourists	402	2.02

$$CF_3 = \frac{402-200}{100} = \frac{202}{100} = 2.02$$

$$CF_3\% = \frac{100 - CF_3}{100} = \frac{100-2.02}{100} = 0.9798$$

v.) **CF_4 (Activity correction factor)**

Total available area at Mahasu Peak = 27900 m^2

Area occupied by different activities at Mahasu Peak hindering the free movement = 3609 m^2

$$\text{Proportion area occupied by different activities} = \frac{3609}{27900} = 0.1294$$

$$\text{Correction Factor } CF_4\% = \frac{100-0.1294}{100} = 0.9987$$

Table 5: Determinants for calculation of Real Carrying Capacity (RCC)

S. No.	Particulars	Detail
1.	PCC	60894

2.	CF_1%	0.8969
3.	CF_2%	0.8000
4.	CF_3%	0.9798
5.	CF_4%	0.9987

Real Carrying Capacity (RCC)

$RCC = PCC \times CF_1\% \times CF_2\% \times CF_3\% \times CF_4\%$

$RCC = 60894 \times 0.8969 \times 0.8000 \times 0.9798 \times 0.9987$

RCC = 42754.42 or say 42754 tourists

(C) Assessment of Effective Carrying Capacity (ECC)

ECC = RCC x MC

RCC (Real Carrying Capacity)

MC (Management Capacity)

$$MC = \frac{R_n}{R_t}$$

R_n = Number of existing Management Officers
= 5

R_t = Number of required Management Officers
= 15

$$MC = \frac{5}{15}$$

MC = 0.33

ECC = RCC x MC, where

RCC = 42754 and MC = 0.33

And hence ECC = 42754 x 0.33

ECC = 14108.82 or **14109 tourists**

Manish Rampal, HPFS
Divisional Forest Officer
Theog Forest Division, Theog