Item No. 01 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 1016/2019

(With report dated 08.02.2021)

Utkarsh Panwar Applicant

Versus

Central Pollution Control Board & Ors. Respondent(s)

Date of hearing: 11.02.2021

Date of uploading the order: 17.02.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. Question for consideration is extending applicability of Graded Response Action Plan (GRAP), already applicable to Fixed Chimney Bull Trench Kilns (FCBTK), to other coal fired brick kilns, including those using 'Zig-Zag' technology **in NCR during the period the air quality is 'severe'**, having potential for adverse health effects. Further issue that has emerged is the carrying capacity of the air quality in NCR region to sustain the brick kilns. Associated issue is improving effectiveness of safeguards and the regulatory measures to minimise the impact of air pollution by operation of brick kilns, where such brick kilns are otherwise permissible. Last issue is the effect of an individual unit being compliant with the prescribed norms in absence of carrying capacity of the environment to sustain such activity and right of inter-se parity of polluting activities to operate in absence of carrying capacity.

2. As per terms of GRAP, FCBTK brick kilns stand prohibited under 'severe' condition of air quality by the order of the Environment Pollution (Prevention and Control) Authority (EPCA) dated 01.11.2019. The applicant herein seeks extending such prohibition to brick kilns operated by 'Zig-Zag' technology, which also involve coal as fuel and cause pollution load which in 'severe' air quality conditions becomes hazardous to health. According to the applicant, even brick kilns run by 'Zig-Zag' technology add to $PM_{2.5}$ and contribute to the air pollution in the NCR and should not be allowed till GRAP is applicable i.e. when air quality is severe and above.

3. We Prima facie accepted the stand of the applicant by way of interim order dated 15.11.2019, which has been continued by subsequent orders, last order being dated 15.10.2020, which stands affirmed by the Hon'ble Supreme Court on 5.1.2021 in CA No. 14-16 of 2021 as follows: -

> *"We are not inclined to interfere with the orders passed by the National Green Tribunal.*
>
> ***The Civil appeals are, accordingly, dismissed.*** *However, all pleas and contentions of the appellant are left open"*

4. The expert Committee appointed by this Tribunal, based on which, last order dated 15.10.2020 was passed, held that during the period the air quality is 'severe' in NCR, there is no carrying capacity to sustain such kilns. However, the Tribunal required a report whether there are alternatives like cleaner fuel to sustain such activity which does not add to pollution load. This course was earlier adopted the Tribunal in respect of Morbi Industrial Area in Gujrat by requiring tie manufactures to close coal-based activities and operate only using PNG which order has been referred to in earlier orders. Reference was also made to earlier order of the Hon'ble Supreme Court in respect of brick kilns in Taj area. The scope of today's proceedings is not to revisit the said order but only to consider

permissibility of such brick kilns in 'severe' condition of air quality, on switching to PNG or with other alternative, if any, by which no load of pollution is added, so as to function when air quality is severe. The details of the subject and the background follows.

5. Categories of air quality and its adverse health effect can be noticed from following tables extracted from the judgment of the Hon'ble Supreme Court in *Arjun Gopal & Ors. v. UOI & Ors.*[1]*:*

Table 1

AQI	***Associated Health Impacts***
Good (0-50)	***Minimal impact.***
Satisfactory (51-100)	***May cause minor breathing discomfort to sensitive people.***
Moderately polluted (101-200)	***May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.***
Poor (201-300)	***May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease.***
Very Poor (301-400)	***May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.***
Severe May (401-500)	***May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.***

Table 2

AQI Category, Pollutants and Health Breakpoints								
AQI category (Range)	***PM_{10} 24-hr***	***$PM_{2.5}$ 24-hr***	***NO_2 24-hr***	***O_3 8-hr***	***CO 8-hr (mg/m^3)***	***SO_2 24-hr***	***NH_3 24-hr***	***Pb 24-hr***
Good (0-50)	***0-50***	***0-30***	***0-40***	***0-50***	***0-1.0***	***0-40***	***0-200***	***0-0.5***
Satisfactory (51-100)	***51-100***	***31-60***	***41-80***	***51-100***	***1.1-2.0***	***41-80***	***201-400***	***0.5-1.0***
Moderately polluted (101-200)	***101-250***	***61-90***	***81-180***	***101-168***	***2.1-10***	***81-380***	***401-800***	***1.1-2.0***
Poor (201-300)	***251-350***	***91-120***	***181-280***	***169-208***	***10-17***	***381-800***	***801-1200***	***2.1-3.0***
Very poor (301-400)	***351-430***	***121-250***	***281-400***	***209-748****	***17-34***	***801-1600***	***1200-1800***	***3.1-3.5***
Severe (401-500)	***430+***	***250+***	***400+***	***748+****	***34+***	***1600+***	***1800+***	***3.5+***

[1] (2017) 1 SCC 412

6. During the course of consideration of the matter, in the light of the principle of 'Sustainable Development' of which 'Precautionary' principle is a part, it was found that number of brick kilns in NCR could not be unlimited and located close to each other or to the habitation or sensitive establishments like schools, hospitals, etc. This required study of the carrying capacity of different areas in the NCR in different seasons. Accordingly, such study was conducted. Table-15 appended to the CPCB report dated 06.07.2020, contains month-wise and district-wise estimation of number of brick kilns which can be operated without affecting ambient air quality as follows:

Table 15: *Month-wise and District-wise estimation of the number of brick kilns which can be operated in NCR districts of Haryana, Uttar Pradesh and Rajasthan, without affecting ambient air quality.*

S. No.	Name of District	Total No of Zig Zag type Brick Kilns	Month-wise No of Zig Zag type Brick Kilns, which can be operated without affecting the ambient air quality i.e within Assimilative Carrying Capacity								
			Mar-19	Apr-19	May-19	Jun-19	**Oct-19**	**Nov-19**	**Dec-19**	**Jan-20**	**Feb-20**
STATE- HARYANA											
1	Bhiwani	132	161	52	16	46	**0**	**0**	**0**	**0**	**0**
2	Faridabad (Ballabhgarh)	85	25	0	0	0	**0**	**0**	**0**	**0**	**0**
3	Gurugram	6	0	0	0	0	**0**	**0**	**0**	**0**	**0**
4	Jhajjar	387	376	320	283	327	**0**	**0**	**0**	**0**	**0**
5	Jind	111	72	0	0	0	**0**	**0**	**0**	**0**	**0**
6	Karnal	92	57	0	0	0	**0**	**0**	**0**	**NA**	**0**
7	Mahendragarh	42	33	0	0	0	**0**	**0**	**0**	**0**	**0**
8	Nuh (Mewat)	62	57	0	7	28	**0**	**0**	**0**	**NA**	**0**
9	Palwal	110	84	1	15	0	**0**	**0**	**0**	**0**	**0**
10	Panipat	87	84	23	0	37	**0**	**0**	**0**	**0**	**0**
11	Rewari	76	49	0	0	0	**0**	**0**	**0**	**0**	**0**
12	Rohtak	49	NA	31	21	12	**0**	**0**	**0**	**0**	**NA**
13	Sonipat	265	253	151	102	106	**0**	**0**	**0**	**0**	**0**
14	Charkhi Dadri	29	NA	NA	NA	NA	**NA**	**NA**	**NA**	**NA**	**NA**

STATE- UTTAR PRADESH

S. No.	Name of District	Total No of Zig Zag type Brick Kilns	Month-wise No of Zig Zag type Brick Kilns, which can be operated without affecting the ambient air quality i.e within Assimilative Carrying Capacity								
			Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bagpat	340	300	211	165	131	**0**	**0**	**0**	**2**	**0**
2	Bulandshahr	200	8	0	0	0	**0**	**0**	**0**	**0**	**0**
3	Gautam Budh Nagar	65	12	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4	Ghaziabad	79	11	0	0	0	**0**	**0**	**0**	**0**	**0**
5	Hapur	52	30	0	0	NA	**0**	**0**	**0**	**0**	**0**
6	Muzaffarnagar	146	42	0	0	0	**0**	**0**	**0**	**0**	**0**

7	Meerut	70	16	5	1	18	**0**	**0**	**0**	**0**	**0**
8	Shamli	80	57	53	40	51	**0**	**0**	**0**	**NA**	**NA**
STATE- RAJASTHAN											
1	Alwar	70	0	0	0	0	**0**	**0**	**0**	**0**	**0**
2	Bharatpur	60	0	0	0	0	**0**	**0**	**0**	**0**	**0**

7. Assimilative capacity data in the CPCB report dated 06.07.2020 is given in subsequent part of this order in Tables 6 to 8 which are part of the same report.

8. The matter has been earlier considered on six occasions, last being on 15.10.2020. The Tribunal by the said order held that in 'severe' air quality condition coal fired brick kilns could not be operated even if run by Zig-Zag technology. It was further held that number of brick kilns even during the period when air quality was not 'severe' had to be in terms of the carrying capacity. It was further found that merely because there were other sources of pollution or some individual brick kilns met the standards of air quality by themselves could not be ground not to apply GRAP to the said brick kilns. The GRAP could be extended to identified sources of pollution without a right of parity with other activities causing pollution. The appeal of the brick-kiln owners against the same stands dismissed by the Hon'ble Supreme Court vide order dated 5.1.2021, as already noted in para 3 above. The concluding part of the order dated 15.10.2020 is reproduced below:

> "***Conclusion***
>
> *27. Thus, in view of report of the CPCB, at this stage* ***it is not possible to vacate direction not to permit operation of brick kilns in NCR beyond the carrying capacity found by the CPCB. All applications of the brick kiln owners seeking rejection of CPCB report and vacation of interim order against operation of brick kilns, without air quality assimilative capacity permitting such activity will stand rejected subject to further exploring viable options, including change to clean fuel like natural gas****. We are conscious that brick kilns may be necessary. Object of this order is not to stop any legitimate business activity but to enforce the right to breathe fresh air which is right to file. The source*

apportionment studies, placed on record, show that brick kilns contribute 5-7% PM. Air pollution Control devices to be installed by the polluting sources including the brick kilns need to comply not only the consent standards but are also the Ambient Air Quality norms and available assimilative capacity of the region. ***If the right to fresh air is not enforced, the consequences of brick kilns beyond carrying capacity of the air quality in the area are disastrous in terms of deaths and air borne diseases. This will be contrary to the mandate of the Constitution and the environmental law, particularly the principle of 'Sustainable Development'. It is well established that deteriorated ambient air quality in terms of PM_{10} and $PM_{2.5}$ affects respiratory system particularly, the lungs which may make individuals more vulnerable to get other related fatal diseases***.[2]

28. Accordingly, we direct CPCB to constitute a Committee of five experts to suggest ways and means, if any, by which sustenance of brick kilns activities may be viable. It will be open to CPCB to nominate in-house or other Experts. The CPCB may also explore viability of PNG as replacement of coal and other best practices in terms of fuel used, at other places or in other Countries. It will be open to the brick kilns owners/associations to give any other suggestions or alternatives for consideration by CPCB in spirit of collaboration with a view to find a solution within two weeks from today. Subject to the report of the expert Committee finding it viable, possibility of permitting operation of brick kilns, having regard to the extent of pollution load and its effect on the air pollution level in NCT of Delhi may be considered. The CPCB may constitute an expert Committee within three weeks which may give its report within six weeks thereafter. Further report may be furnished in the matter before the next date 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."

9. A report has been filed by the CPCB dated 8.2.2021, alongwith the report of a Committee, constituted by it, recommending operation of coal-fired brick kilns with zig-zag technology, without clean fuel or alternative by which no pollution is added. **We find difficult to accept the same as it is in conflict with the order of this Tribunal dated 15.10.2020, affirmed by the Hon'ble Supreme Court**. It fails to consider the carrying capacity to sustain any further pollution when air quality is 'severe'. Scope

[2] https://airqualitynews.com/2020/08/13/the-link-between-air-pollution-and-covid-19/http://www.babushahi.com/full-news.php?id=107487

of consideration[3] being confined to permissibility of brick-kilns with cleaner fuel or any other alternative which may not add to pollution load, in absence of carrying capacity to sustain further pollution load of brick-kilns fired by coal, the report is of no assistance.

10. This application was first taken up on 15.11.2019. The Tribunal directed that till air quality was 'severe', coal fired brick kilns, even operating on zig zag technology, may not be allowed to operate in NCR. The matter has been considered subsequently on five occasions: 18.12.2019, 06.02.2020, 05.03.2020, 23.03.2020 and 15.10.2020 in the light of the carrying capacity to determine whether such brick kilns could be allowed to operate without being health hazard to the citizens. It was found that such operation was not permissible in 'severe' condition of air quality without compromising public health. There is no change in situation even now on this aspect. Coal as a fuel adds to air pollution and when air quality is 'severe' brick kilns can be allowed on replacing coal by cleaner fuel like Piped Natural Gas (PNG). This is the reason behind GRAP not permitting other coal-fired brick kilns. The logic applies to zig zag technology kilns also, though compared to FCBTK, it is better. It does not result in zero pollution during 'severe' conditions when any addition to pollution load is hazardous to health. Since, as per independent study, there was no carrying capacity of the air quality of the NCR Region to sustain coal-fired brick kilns during 'severe' conditions, using zig-zag technology, which does not eliminate pollution could not justify such brick kilns. It will suffice to reproduce the operative orders passed on five last occasions which are as follows:

[3] See paras 27 and 28 of order dated 15.10.2020 reproduced in subsequent part of this order.

A. Order dated 18.12.2019:

"*4. In view of the above, while CPCB may conduct further study for assessment of different types of brick kilns with reference to source emissions from different types of fuels, having regard to the conclusion that average fugitive SPM values are almost same in FCBTK and Zig-Zag brick kilns, the interim order directing closure of brick kilns in NCR will continue till the next date.* ***Thereafter, brick kilns in NCR may be allowed only consistent with the carrying capacity and siting criteria, subject to GRAP, consent conditions and background concentration of ambient air quality****."*

B. Order dated 06.02.2020:

"*3. Since brick kilns can be permitted only after ascertaining the carrying capacity as above, let a report about carrying capacity of the NCR region in above terms be furnished by CPCB before the next date by e-mail at judicial-ngt@gov.in****."***

C. Order dated 05.03.2020:

"*4. In view of the above, a report has been filed by the CPCB on 04.03.2020 as follows:*

> *"As per information provided by SPCBs, there are total 3278, 2854 and 19003 brick kilns in Haryana, Punjab and Uttar Pradesh respectively, out of which 1918, 701 and 1343 brick kilns have been converted to Zig-Zag technology. With regard to NCR regions, out of 2187, 2216 and 251 brick kilns in Haryana, Uttar Pradesh and Rajasthan respectively,* ***1504, 1032 and 127 brick kilns have been converted to Zig-Zag technology****.*
>
> *Brick Kilns based on Zig-Zag technology using agro-residues are located only in NCR districts.*
>
> *Different types of activities with potential of air pollution, including operation of brick kilns in Delhi-NCR are regulated through a Graded Response Action Plan (GRAP) by Environmental Pollution Control Authority.* ***As per GRAP, Brick kilns in NCR are required to be shut under severe conditions i.e. when $PM_{2.5}$ and/or PM_{10} concentration goes beyond 250 µg/m³ and/or 430 µg /m³ respectively.***
>
> *In view of the expected higher concentration of PM emissions during winter months, brick kilns in the NCR regions were kept closed during this period as per directions of EPCA.* ***However, now, looking into the forecast of favourable meteorological conditions and expected improvement in the air quality, Environmental Pollution Control Authority (EPCA) has directed that operation of those brick kilns in NCR districts, which have converted to Zig-zag technology, be allowed, vide letter No. EPCA-R/2020/L-09 dated February 14, 2020*** *(Copy enclosed as Annexure-I).*

Further, air quality data of 2019 in NCR, was examined. Analysis indicated that ***$PM_{2.5}$*** *concentration in summer months (March-June) is lower (****Average 80 µg /m³)*** *in comparison to winter months (Average 173 µg /m³). Similarly,* ***PM_{10}*** *concentration in summer months (March-June) is lower (****Average 219 µg /m³)*** *in comparison to winter months (Average 283 µg /m3).*

The past data of 2019 w.r.t. PM_{10} & $PM_{2.5}$ concentration in Delhi, is summarized in ***Table 1:***

Table 1: *Monthly data of CAAQMs w.r.t. PM Concentration for 2019, in Delhi*

Month	***$PM_{2.5}$, µg/m³***	***PM_{10}, µg/m³***
January	*203*	*322*
February	*122*	*215*
March	*83*	*184*
April	*83*	*236*
May	*89*	*247*
June	*63*	*209*
July	*47*	*143*
August	*35*	*85*
September	*40*	*98*
October	*128*	*247*
November	*202*	*312*
December	*209*	*316*

Therefore, in view of submission that 65 Nos brick kilns are proposed to be monitored in both NCR and Non-NCR regions, involving total 585 stack emissions' samples, in compliance of the directions of Hon'ble NGT in the matter of 0.A. No. 1016/2019 and 0.A. No. 1088/2018, it is humbly prayed as under:

I. *Brick Kilns based on Zig-Zag technology using agro-residues are located only in NCR districts and if these are to be monitored to assess the performance of brick kilns operating on agro-residues, under comparable situations, the Zig-Zag type brick kilns in NCR regions, which are presently closed, may have to be made operational, to facilitate monitoring.*

II. *Atleast 04 months' time period may be granted to CPCB, for Monitoring of 65 brick kilns in NCR and Non-NCR regions and submission of report covering* ***i) Impact of brick kilns operation on loss/degradation of top soil, ii) study involving Carrying Capacity Assessment of brick kilns with adequate samples in terms of number of brick kilns and days for which monitoring be conducted, iii) Evaluation of the performance of brick kilns against the background concentration and carrying capacity of the area and iv) Impact on Brick Kilns operation on ambient air, in the matters of O.A. No. 1016/2019 and O.A. No. 1088/2018, after commencement of operation of brick kilns in NCR regions.****"*

5. ***We have heard learned Counsel for the CPCB and for the brick kilns, including those who have filed applications for being implead as party in pursuance of order of Hon'ble Supreme Court dated 20.02.2020 in C.A. No. 1733-35/2020.***

6. Learned Counsel for the CPCB submitted that having regard to the data of air quality, even though as per GRAP brick kilns are to be mandatorily shut throughout NCR only under 'severe conditions', ***no polluting activity, including brick kilns, can be permitted beyond 'carrying capacity' and air quality norms under the Air (Prevention and Control of Pollution) Act, 1981.*** *On the other hand, the stand of the brick kilns is that unless the conditions are 'severe' to attract GRAP and unless prohibited by EPCA, 'Zig-Zag' technology brick kilns have right to operate irrespective of the air quality norms. Reliance has also been placed on norms for brick kilns under Schedule-I, Sr. No. 74 of Environment (Protection), Rules 1986. Alternatively, it is submitted that at such locations where air quality is within norms, brick kilns may be allowed. By way of example, it is stated that the ambient air quality data at Alwar, as on 18.02.2020, is within norms.*

7. ***We do not find any merit in the contention that only in 'severe' conditions brick kilns can be prohibited even if the air quality is beyond permissible norms and the area has no assimilative or supportive capacity. Emission norms of individual brick kilns is not a conclusive factor for dealing with the issue, if the carrying capacity of the area does not allow the brick kilns in question****. However, we do need to consider the submission that where air quality is within the norms and there is carrying capacity, brick kiln can be allowed.*

8. In view of the above, ***it is necessary to look at the relevant data at different locations '24 hourly' and 'monthly average' during the relevant months. Since such data is maintained by the CPCB/PCBs, the CPCB may collect such data for corresponding months of March, April, May and June in the year 2019 and furnish the same before the next date. The break-up of location of the brick kilns District-wise may also be furnished to consider as to which of the brick kilns can be allowed after verification that such brick kilns are actually working on 'Zig-Zag' technology, pending further assessment of the carrying capacity by the CPCB, as already directed earlier vide order dated 06.02.2020****."*

D. <u>Order dated 23.03.2020:</u>

"*6. We have considered the above data which shows that in the corresponding months when brick kilns were operating, standard of air quality was not as per prescribed norms. Thus, the air quality of the area is unable to take further pollution load. In this regard, it may be noted that while considering the issue of operation of brick kilns in non-NCR area, where GRAP was not applicable as such, in O.A. No. 1088/2018, Dinesh Chahal & Ors. vs. Union of India & Ors., the Tribunal vide order dated 30.04.2019 observed that standards of ambient air quality are required to be maintained under Section 17(g) of the Air Act, 1981:*

> *"3. … The matter was again considered on 21.02.2019 with reference to the* ***contention that the impugned order was only for Non-NCR to which order of CPCB or EPCA did not apply. The Tribunal held that even in Non-NCR, Standards of Ambient Air Quality laid down under***

Section 17 (g) of the Air Act are required to be followed. If the impugned order has been passed without undertaking any study on status of ambient air quality without any carrying capacity assessment to take the additional load at concerned areas and without any safeguards on 'Precautionary' principle, the same may not be justifiable having regard to the acknowledged adverse impact of operation of the brick kilns on the ambient air quality. *Reference was made to the Judgements of the Hon'ble Supreme Court in M.C. Mehta v. Union of India, (1998) 9 SCC 149, M.C. Mehta v. Union of India (2000) 7 SCC 422, M.C. Mehta v. Union of India, (2002) 4 SCC 378, K. Guruprasad Rao v. State of Karnataka, (2012) 12 SCC 736 wherein the Hon'ble Supreme Court directed closure or shifting of brick kiln industries and M.C. Mehta v. Union of India, (2001) 9 SCC 235 laying down that brick kilns may be allowed to operate after studying the impact on human population and vegetation."*

7. Learned Counsel for the brick kiln operators, however, submit that prohibition on operation of brick kilns be lifted as some individual brick kilns meet the air quality emission standards laid down under the Environment (Protection) Rules, 1986 and the brick kilns are not the only source of pollution. Contribution of all the brick kilns taken together, to the air pollution, was about 3%. It was also mentioned that as at present air quality norms are within limit in seven districts out of 15 districts of NCR.

8. As observed earlier, ***the question is not merely of an individual brick kiln not emitting pollution or the extent of contribution of the brick kilns taken separately, but of the capacity of the area being already air polluted and unable to take the load of pollution. When there is no carrying capacity in the area for further air pollution, we find it difficult to permit operation of the closed brick kilns to uphold the 'Sustainable Development' principle. When even without operation of the brick kilns the air quality is not within the norms, the impact of operation of the brick kilns cannot be ignored. Thus, we find it difficult to accept the submission that the individual brick kilns maintaining the prescribed standards for discharge of emissions are entitled to operate or that they be allowed to operate on the ground that pollution caused by the brick kilns is less than other pollution from other sources irrespective of carrying capacity of the area. The fact remains that brick kilns add to the air pollution and thereby affect right of citizens to breathe fresh air.***

9. We may now consider another aspect of the matter i.e. impact of the brick kilns on the top soil. As noted in order dated 05.03.2020, CPCB has undertaken to look into this aspect and has not yet completed its study. As per available study, ***there is huge environmental cost in using top soil for making brick making.***[4]

[4] www.journals.sagepub.com/doi/abs/10.1177/0974929214521892# (Environmental Cost of using top-soil for brick making – a case study form India (MoEF, GoI project) (Published in Review of Market Integration, 2013) Vinish Kathuria, Professor, IIT Bombay – March 11, 2015.

Reference may also be made to a study on "The Impact of Brick Kiln operation to the degradation of topsoil quality of Agricultural Land".[5] *There is further issue of unutilized fly ash adversely affecting the environment which may require barring red clay brick kilns. This is proposed in a draft notification of the MoEF&CC 25.02.2019 within 300 kms of coal or lignite based thermal power plants. No doubt the said notification is only a draft but the same is evidence of such step being necessary for sustainable development.*

10. ***Main reason for air pollution by brick kilns is use of coal etc. as fuel. The pollution can be minimized if the fuel which is currently used is considered to be replaced by cleaner fuels like PNG by appropriate modification in design not adding to the PM load. Dealing with the air pollution caused in Morby Industrial Area in Gujarat on account of coal gasifiers in tile manufacturing, the Tribunal directed closing of coal gasifier industries without prejudice to such industries switching over to non-coal gasifiers, PNG or other such technology. It was directed[6]:***

> ***"25. Accordingly, we allow the applications and direct the GPCB to close all coal gasifiers industries and units operating with the help of coal gasifiers without prejudice to such units switching over to non-coal gasifiers or PNG or technology consistent with the above report. The GPCB must initiate immediate steps for prosecution of the industries which have operated in violation of law and recover compensation for causing damage to the environment and public health."***

11. Issue of allowing operation of brick kilns may give rise to following questions:

(i). The use of cleaner fuels or any other alternative measures to be used to prevent air pollution.

(ii). Siting and carrying capacity.

12. In view of the fact that there is no carrying capacity of the air quality in NCR region to permit any further addition to PM load by permitting unconditional operation of brick kilns using fuel which adds to PM load and since it may be necessary to consider the issue of utilizing fly ash, we require an expert opinion on following issues:

(a) how brick kilns can be allowed in NCR without damage to the air quality;

(b) conditions subject to which it may be done;

(c) number of brick kilns to be allowed and criteria for fixing such numbers.

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[5]www.researchgate.net/publication/282431176_The_impact_of_brick_kiln_operation_to_the_degradation_of_topsoil_quality_of _agricultural_land.

[6] Order dated 06.03.2019 in O.A. No. 20/2017 (WZ), Babubhai Ramubhai Saini vs. Gujarat Pollution Control Board & Ors.

*13. Let CPCB look into the above issues and furnish a further report within one month for further directions in the matter. The applicants are free to put forward their viewpoint before CPCB.***"**

E. <u>Order dated 15.10.2020:</u>

7. Accordingly, in above backdrop, the CPCB has given its report dated 06.07.2020. The CPCB considered suggestions/objections of the Brick Kiln Owner Association in terms of order of this Tribunal which have been summed up in the report as follows:-

"*(a) The brick kilns are complying with the directions of CPCB w.r.t. shifting from the Old Fixed Chimney Bull Trench Kiln Technology to Zig-Zag Technology.*

(b) The brick Kilns have been established as per siting criteria.

(c) The Hon'ble Supreme Court of India in Civil Appeal No. 1742-43 of 2020 (Diary No. 5935/2020) vide order dated 20/02/2020 requested Hon'ble NGT to decide the O.A. No. 1016/2019, in the light of the provisions of the Graded Response Action Plan (GRAP) of MoEF&CC and EPCA order dated 14/02/2020.

(d) The brick kilns in NCR regions are required to be closed under Severe Category (PM_{10} > 430 ug/m^3 or $PM_{2.5}$ > 250 ug/m^3) under GRAP.

(e) Brick Kilns based on Zig-Zag technology are less polluting and are complying with the both existing and proposed standards for stack emissions.

(f) PNG, CNG and industrial LPG are not available in majority of places where brick kilns are situated.

(g) The blanket ban on operation of brick kiln industries has affected livelihood rights of approximately one million people in the national Capital region.

(h) The brick Kiln industries are seasonal and hence only operate from January to June and indefinite closure for the want of study would cause and has already caused irreparable damage to the brick kiln industry.

(i) Utilization of fly ash may not be treated as a true alternative unless the harmful impacts of fly ash bricks are not studied.

(j) A report on "Source Apportionment of $PM_{2.5}$ and PM_{10} of Delhi NCR for identification of major sources" prepared by ARAI and TERI for Department of Heavy Industry, Ministry of Heavy Industries and Public Enterprises, New Delhi, in the year 2016, reveals that brick kiln industry contributed only about 8% to the air pollution of Delhi and NCR. It was further found that the brick kilns shifting to Zig-Zag technology would further lead to reduction of 3%, 4% and 6 % in total $PM_{2.5}$, PM_{10} and SO2

emissions. The contribution of the brick kilns is very less in Delhi and NCR after conversion to Zig-Zag technology.
(k) The utilization of fly ash in the manufacture of bricks is not only unfeasible because of several issues involved in the transportation of fly-as to brick- kilns. It poses several health hazards to the inhabitants residing in buildings made thereof, in addition to health hazards to laborers working at brick-kilns and on construction sites.

(l) ***Various kinds of industrial and other activities contribute together to saturate the carrying capacity of the region. It is submitted that saturation of the carrying capacity of Delhi-NCR cannot be the basis for denying permission to brick kilns to operate. This is particularly because brick kilns emissions are not amongst the main contributors to air pollution in Delhi-NCR.***

(m) ***Any directions that prohibit brick kilns from operating in Delhi- NCR on account of saturation of the carrying capacity, without first prohibiting the other more polluting activities, would be arbitrary and violative of Article 14 and Article 19(1)(g) of the Constitution of India****.*

(n) ***The brick kilns may be allowed to operate at par with other activities that together contribute to the carrying capacity of Delhi-NCR, subject to the conditions of the Consent to Operate and guidelines issued by the regulatory bodies so as to avoid fugitive dust emissions.***

(o) The directions issued by the EPCA from time to time are sufficient to ensure that the brick kilns operate in Delhi-NCR without any damage to the air quality.

(p) The brick kilns that do not comply with the conditions of the Consent to Operate and other guidelines issued by the regulatory bodies from time to time may also be closed down with immediate effect.

*(q) The brick kilns, which have adopted the zig-zag technology, may be permitted to operate in Delhi-NCR.***"**

8. Thereafter, the CPCB has referred to the District wise carrying capacity with reference to the monthly average of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) PM_{10} values in the ambient air during the months of March 2019 – June, 2019 and October 2019 – February, 2020 were analysed for NCR districts of Haryana, UP and Rajasthan. Report further refers to the statistic of zig zag type brick kilns in the NCR region and emission load by the brick kilns. With a view to calculate carrying capacity, following components were considered:-

"i. Estimation of Existing Pollution Load w.r.t
ii. Estimation of Assimilative Carrying Capacity w.r.t PM_{10}
iii. Estimation of Supportive Carrying Capacity w.r.t PM_{10}**"**

9. The data with reference to the above parameters are as follows:-

"Table 6: Total Existing Plylio Load, Assimilative Carrying Capacity and Supportive Carrying Capacity in NCR Districts of Haryana.

Table 6(a):

S.No.	Name of District	Total PM_{10} Load, Kg (x)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bhiwani	210232	367562	503745	475659	478478	457212	368260	271515	380314
2	Far id (Ballabhgarh)	96701	134048	187497	158420	104164	100606	118395	94829	112797
3	Gurugram	103785	194307	227513	191961	165102	177733	150341	102872	127176
4	Jhajjar	102704	177460	252854	209516	171112	158039	115148	93204	131063
5	Jind	174279	282559	418543	418918	307558	335718	204744	144806	199372
6	Karnal	161280	280186	355607	341349	355809	337093	233508	NA	221082
7	Mahendragarh	104445	190597	212532	206095	174814	136050	106895	117563	127985
8	Nuh(Meyvap	80625	159404	177216	157403	134979	129861	90049	NA	119077
9	Palwal	93895	189997	204889	222688	152939	164475	111147	81141	129514
10	Panipat	65936	140221	243718	153134	236609	212180	209735	62096	184177
11	Rewari	106798	182019	248205	253637	232004	203641	153915	139921	193558
12	Rohtak	NA	123118	169389	179357	169898	166483	173986	141889	NA
13	Sonipat	**117771**	**241036**	**335584**	**332458**	**237579**	**170100**	**151606**	**263718**	**208357**
14	CharkhiDadd	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6(b):

S.No.	Name of District	Assimilative Carrying Capacity, Kg (y)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bhiwani	238900	287158	387496	389885	297192	239378	206887	220744	277602
2	Faridabad (Ballabhgarh)	37050	44534	60095	60466	46090	37124	32085	34234	43052
3	Gurugram	62900	75606	102024	102653	78248	63026	54471	58120	73090
4	Jhajjar	91700	110223	148737	149654	114075	91883	79412	84731	106555
6	Jind	135100	162390	219132	220483	168064	135370	116997	124832	156986
6	Karnal	126000	151452	204372	205632	156744	126252	109116	116424	146412
7	Mahendragarh	94950	114130	154009	154958	118118	95140	82227	87734	110332
8	Nuh(Mewat)	75350	90571	122218	122971	93735	75501	65253	69623	87557
9	Palwal	67550	81195	109566	110242	84032	67685	58498	62416	78493
10	Panipat	63400	76207	102835	103469	78870	63527	54904	58582	73671
11	Rewari	79700	95799	129273	130070	99147	79859	69020	73643	92611
12	Rohtak	87250	104875	141520	142392	108539	87425	75559	80619	101385
13	Sonipat	106100	127532	172094	173155	131988	106312	91883	98036	123288
14	Charkhi Dadri	69050	82998	111999	112699	85898	69188	59797	63802	80236

Table 6(c):

S.No.	Name of District	Supportive Carrying Capacity, Kg (z) i.e (y-x)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bhiwani	28668	-80404	-116249	-85775	-181287	-217834	-161372	-50771	-102713
2	Faridabad (Ballabhgarh)	-59651	-89514	-127402	-97954	-58074	-63482	-86309	-60595	-69744
3	Gurugram	-40885	-118701	-125489	-89308	-86855	-114707	-95870	-44752	-54086
4	Jhajjar	-11004	-67236	-104116	-59862	-57037	-66156	-35735	-8473	-24508
5	Jind	-39179	-120169	-199410	-198435	-139493	-200348	-87747	-19973	-42386
6	Karnal	-35280	-128734	-151235	-135717	-199065	-210841	-124392	NA	-74670
7	Mahendragarh	-9495	-76467	-58523	-51136	-56697	-40910	-24668	-29829	-17653
8	Nuh (Mewat)	-5275	-68834	-54998	-34432	-41244	-54361	-24796	NA	-31520
9	Palwal	-26345	-108801	-95323	-112446	-68906	-96790	-52648	-18725	-51021
10	Panipat	-2536	-64014	-140884	-49665	-157739	-148653	-154830	-3515	-110506
11	Rewari	-27098	-86219	-118932	-123567	-132857	-123782	-84895	-66279	-100946
12	Rohtak	NA	-18244	-27870	-36965	-61359	-79059	-98428	-61270	NA
13	Sonipat	-11671	-113504	-163489	-159303	-105591	-63787	-59724	-165682	-85069
14	Charkhi Dedri	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7: Total Existing PM_{10} Load, Assimilative Carrying Capacity and Supportive Carrying Capacity in NCR Districts of Uttar Pradesh

Table 7(a):

S.No.	Name of District	Total PM_{10} Load, Kg (x)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bagpat	106341	208801	281760	316913	187339	201855	148718	58589	161943
2	Bulandshahr	417360	604712	640366	913084	687684	655548	472794	481530	537402
3	Gautam Budh Nagar	117303	187227	227695	266759	220084	213880	189846	134448	166100
4	Ghaziabad	127332	217534	241911	315557	214135	203194	175104	124736	160290
8	Hapur	55440	97578	153620	69300	98525	96883	74017	79279	46399
6	Muzaffarnagar	304608	537164	562334	706434	501088	616458	301971	368488	421485
7	Meerut	182073	218780	277018	261278	391558	337182	289200	243545	289922
8	Shamli	81088	97476	135096	124187	113792	107556	103462	NA	NA

Table 7(b):

S.No.	Name of District	Assimilative Carrying Capacity, Kg (y)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bagpat	66050	79392	107133	107794	82166	66182	57199	61030	76750
2	Bulandshahr	225600	271171	365923	368179	280646	226051	195370	208454	262147
3	Gautam Budh Nagar	64100	77048	103970	104611	79740	64228	55511	59228	74484
4	Ghaziabad	58950	70858	95617	96206	73334	59068	51051	54470	68500
5	Hapur	33000	39666	53526	53856	41052	33066	28578	30492	38346
6	Muzaffarnagar	200400	240881	325049	327053	249298	200801	173546	185170	232865
7	Meerut	127950	153796	207535	208814	159170	1 28206	110805	118226	148678
8	Sham li	58379	70172	94691	95275	72623	5849,6	50556	53942	67836

Table 7(c):

S.No.	Name of District	Supportive Carrying Capacity, Kg (z) i.e (y-x)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Bagpat	-40291	-129409	-174627	-209120	-105173	-135673	-91519	2441	-85193
2	Bulandshahr	-191760	-333541	-274442	-544905	-406937	-429497	-277425	-273075	-275255
3	Gautam Budh Nagar	-53203	-110179	-123725	-162147	-140343	-149652	-134336	-75220	-91616
4	Ghaziabad	-68382	-146676	-146294	-219351	-140801	-144126	-124053	-70266	-91790
5	Hapur	-22440	-57912	-100094	-15444	-57473	-63817	-45439	-48787	-8053
6	Muzaffarnagar	-104208	-296283	-237286	-379381	-251791	-415658	-128424	-183318	-188620
7	Meerut	-54123	-64984	-69483	-52463	-232388	-208976	-178396	-125319	-141244
8	Sham li	-22709	-27305	-40406	-28913	-41168	-49060	-52905	NA	NA

Table 8: Total Existing Plylio Load, Assimilative Carrying Capacity and Supportive Carrying Capacity in NCR Districts of Rajasthan

Table 8(a):

S.No.	Name of District	Total PM_{10} Load, Kg (x)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Alwar	574030	1052603	1291274	1053064	807916	793494	674908	669780	740055
2	Bharatpur	347021	636335	780620	636614	488413	479694	408006	404905	447389

Table 8(b):

S.No.	Name of District	Assimilative Carrying Capacity, Kg (y)								
		Mar-19	Apr-19	May-19	Jun-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Alwar	419000	503638	679618	683808	521236	419838	362854	387156	486878
2	Bharatpur	253300	304467	410853	413386	315105	253807	219358	234049	294335

Table 8(c):

S.No.	Name of District	Supportive Carrying Capacity, Kg (z) i.e (y-x)								
		Mar-19	**Apr-19**	**May-19**	**Jun-19**	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20
1	Alwar	-155030	-548965	-611656	-369256	-286680	-373656	-312054	-282624	-253177
2	**Bharatpur**	-93721	-331869	-369767	-223228	-173308	-225888	-188648	-170856	-153054

10. It was concluded from the above data that there was no supporting carrying capacity to operate brick kilns during the entire brick kilns operating season. However, with regard to Districts where supporting carrying capacity was available in particular months such number was worked out for Haryana, UP and Rajasthan as follows:-

"Table 9: Number of brick kilns which can be operated in NCR Districts of Haryana during March-June.

S.No.	Name of District	Load in Excess of Assimilative Carrying Capacity				Total No of Zig Zag type Brick Kilns	*No of Zig Zag type Brick Kilns, which can be operated			
		March	April	May	June		March	April	May	June
1	Bhiwani	-28668	80404	116249	85775	132	161	52	16	46
2	Faridabad (Ballabhgarh)	59651	89514	127402	97954	85	25	-5	-42	-13
3	Gurugram	40885	118701	125489	89308	6	-35	-113	-119	-83
4	Jhajjar	11004	67236	104116	59862	387	376	320	283	327
5	Jind	39179	120169	199410	198435	111	72	-9	-88	-87
6	Kornai	35280	128734	151235	135717	92	57	-37	-59	-44
7	Mahendragarh	9495	76467	58523	51136	42	33	-34	-17	-9
8	Nuh (Mewat)	5275	68834	54998	34432	62	57	-7	7	28
6	Palwal	26345	108801	95323	112446	110	84	1	15	-2
10	Panipat	2536	64014	140884	49665	87	84	23	-54	37
11	Rewari	27098	86219	118932	123567	76	49	-10	-43	-48
12	Rohtak	NA	18244	27870	36965	49	NA	31	21	12
13	Sonipat	11671	113504	163489	159303	265	253	151	102	106
14	Charkhi Dadri	NA I	NA I	NA I	NA	29	NA	1\ NA	NA	NA

Note: CAAQMS and AOD values for Charkhi Dadri were not available;

***Negative Values indicate that no brick kiln can be operated**

Table 10: Number of brick kilns which can be operated in NCR Districts of Haryana during October- February.

S.No.	Name of District	Supportive Carrying Capacity, Kg					Total No of Zig Zag type Brick Kilns	*No of Zig Zag type Brick Kilns, which can be operated				
		October	Novembe	December	Januar	February		October	November	December	Januar	Februar
1	Bhiwani	-181287	-217834	-161372	-50771	-102713	132	-181	-218	-161	-51	-103
2	Faridabad (Ballabhgarh)	-58074	-63482	-86309	-60595	-69744	85	-58	-63	-86	-61	-70
3	Gurugram	-86855	-114707	-95870	-44752	-54086	6	-87	-115	-96	-45	-54
4	Jhajjar	-57037	-66156	-35735	-8473	-24508	387	-57	-66	-36	-8	-25
5	Jind	-139493	-200348	-87747	-19973	-42386	111	-139	-200	-88	-20	-42
6	Karnal	-199065	-210841	-124392	NA	-74670	92	-199	-211	-124	NA	-75
7	Mahendragarh	-56697	-40910	-24668	-29829	-17653	42	-57	-41	-25	-30	-18
8	Nuh (Mewat)	-41244	-54361	-24796	NA	-31520	62	-41	-54	-25	NA	-32
9	Palwal	-68906	-96790	-52648	-18725	-51021	110	-69	-97	-53	-19	-51
10	Panipat	-157739	-148653	-154830	-3515	-110506	87	-158	-149	-155	-4	-111
11	Rewari	-132857	-123782	-84895	-66279	-100946	76	-133	-124	-85	-66	-101
12	Rohtak	-61359	-79059	-98428	-61270	NA	49	-61	-79	-98	-61	NA
13	Sonipat	-105591	-63787	-59724	-165682	-85069	265	-106	-64	-60	-166	-85
14	Charkhi Dadri	NA	NA	NA	NA	NA	29	NA	NA	NA	NA	NA

Negative Values indicate that no brick kiln can be operated

The month-wise number of brick kilns which can be operated within the assimilative capacity during March-June and October- February are presented in Table 11 and Table 12 respectively, for NCR districts of Uttar Pradesh.

Table 11: *Number of brick kilns which can be operated in NCR Districts of Uttar Pradesh during March-June.*

S.No.	Name of District	Load in Excess of Assimilative carrying Capacity				Total No of Zig Zag type Brick Kilns	*No of Zig Zag type Brick Kilns, which can be operated			
		March	April	May	June		March	April	May	June
1	Bagpat	40291	129409	174627	209120	340	300	211	166	131
2	Bulandshahr	191760	333641	274442	644906	200	8	-134	-74	446
3	Gautam Budh Nagar	63203	110179	123726	162147	66	12	-46	-69	-97
4	Ghaziabad	68382	146676	146294	219361	79	11	-68	-67	-140
6	Hapur	22440	67912	100094	16444	62	30	-6	-48	NA
6	Muzaffarnagar	104208	296283	237286	379381	146	42	-160	-91	-233
7	Meerut	64123	64984	69483	62463	70	16	6	1	18
8	Shamli	22709	27306	40406	28913	80	67	63	40	61

Negative Values indicate that no brick kiln can be operated

Table 12: *Number of brick kilns which can be operated in NCR Districts of Uttar Pradesh during October-February.*

S.No.	Name of District	Supportive Carrying Capacity, Kg					Total No of Zig Zag type Brick Kilns	*No of Zig Zag type Brick Kilns, which can be operated				
		October	November	Decembe	January	Februar		October	November	December	Januar	Februar
1	Bagpat	-105173	-135673	-91519	2441	-85193	340	-105	-136	-92	2	-85
2	Bulandshahr	-406937	-429497	-277425	-273075	-275255	200	-407	-429	-277	-273	-275
3	Gautam Budh Nagar	-140343	-149652	-134336	-75220	-91616	65	-140	-150	-134	-75	-92
4	Ghaziabad	-140801	-144126	-124053	-70266	-91790	79	-141	-144	-124	-70	-92
5	Hapur	-57473	-63817	-45439	-48787	-8053	52	-57	-64	-45	**-49**	-8
6	Muzaffamagar	-251791	-415658	-128424	-183318	-188620	146	-252	-416	-128	-183	-189
7	Meerut	-232388	-208976	-178396	-125319	-141244	70	-232	-209	-178	-125	-141
8	Shamli	-41168	-49060	-52905	NA	NA	80	-41	-49	-53	NA	NA

Negative Values indicate that no brick kiln can be operated

The month-wise number of brick kilns which can be operated within the assimilative capacity during March-June and October- February are presented in Table 13 and Table 14 respectively, for NCR districts of Rajasthan.

Table 13: *Number of brick kilns which can be operated in NCR Districts of Rajasthan during March-June.*

S.No.	Name of District	Load in Excess of Assimilative Carrying Capacity				Total No of Zig Zag type Brick Kilns	*No of Zig Zag type Brick Kilns, which can be operated			
		March	April	May	June		March	April	May	June
1	Alwar	155030	548965	611656	369256	70	-85	-479	-542	-299
2	Bharatpur	93721	318168	311467	120320	60	-34	-258	-251	-60

***Negative Values indicate that no brick kiln can be operated**

Table 14: *Number of brick kilns which can be operated in NCR Districts of Rajasthan during October-February.*

S.No.	Name of District	Supportive Carrying Capacity, Kg					Total No of Tag Zag	No of Zig Zag type Brick Kilns, which can be				
		October	November	Decembe	January	Februar		Octobe	November	December	Januar	Februar
1	Alwar	-286680	-373656	-312054	-282624	-253177	70	-2867	-3737	-3121	-2826	-2532
2	Bharatpur	-173308	-225888	-188648	-170856	-153054	60	-1733	-2259	-1886	-1709	-1531

Negative Values indicate that no brick kiln can be operated"

11. Finally, it has been concluded:-

"2.3. CPCB's Opinion:

CPCB was directed by Hon'ble NGT to give an expert opinion on the following:

(a) How brick kilns can be allowed in NCR without damage to the air quality;
(b) Conditions subject to which it may be done;
(c) Number of brick kilns to be allowed and criteria for fixing such numbers.

Following is the submission of CPCB on the above points:

i) Based on the evaluation of the data and estimation of the carrying capacity as explained in the previous section, there is no assimilative capacity available in the ambient air environment in the NCR districts of Haryana, Uttar Pradesh and Rajasthan for simultaneous operation of all the existing brick kilns, even after adopting Zig-zag technology. Based on the available assimilative capacity, some brick kilns may operate.

ii) An effort was made to estimate the number of brick kilns which can be operated, within the assimilative capacity of the ambient air environment. The outcome of the month-wise and district-wise estimation w.r.t. the number of brick kilns which can be operated within the assimilative capacity without any negative effect on the ambient air is summarized in ***Table 15.*** *In the districts, where ambient air quality data for the past is not available, due to non-availability of CAAQMS or AOD, the data of the districts having comparable population and geographical area, may be used for estimating the number of brick kilns which can be operated without affecting the ambient air quality, by the respective State Pollution Control Boards, while doing such exercise.*

xxx ……xxx……xxx

iii. ***However, the Zig-Zag type brick kilns may be asked to comply with the proposed Particulate matter standards of 250 mg/Nm^3 at 17 % 02 w.r.t. stack emissions of Particulate Matter (PM). State Pollution***

Control Boards may ensure operation of only permitted number of Zig-Zag type brick kilns and compliance of PM emission norms of 250 mg/Nm³ at 17 % 02.

iv. The examination of the month-wise and district-wise carrying capacity, indicates that Zig-zag type brick kilns in NCR districts should preferably be operated in summer months only, unless or until there is improvement in environmental condition through reduction in PM_{10} emissions by various sources which contribute towards PM_{10} emissions in Delhi NCR, leading to availability in the supportive carrying capacity.

The reduction in PM_{10} emissions by all the contributing sources of PM_{10} emissions in Delhi-NCR becomes more significant in view of the fact that , the findings of a study on "Source Apportionment of $PM_{2.5}$ and PM_{10} of Delhi NCR for identification of major sources" prepared by Automotive Research Association of India (ARAI) and The Energy and Resources Institute (TERI) for Department of Heavy Industry, Ministry of Heavy Industries and Public Enterprises, New Delhi, in the year 2016, indicates that that brick kiln industry contributed about 5 & 7% w.r.t. PM_{10} emissions in Winter and summer respectively, in ambient air of Delhi and NCR . Further reduction of 4% in total PM_{10} was expected after conversion to Zig-Zag technology, which has now been implemented by brick Kilns in Delhi-NCR.

v. The ***selection of brick kilns which can be operated, should be made in such a manner that there is distance of 500 mtr between two operational brick kilns, so as to ensure minimum localized impact on the ambient air.***

vi. In the study conducted by CPCB in the matter of O.A. No. 1088 of 2018 (I.A. No. 98/2019, 100/2019, 101/2019, 119/2019 & 266/2019); Dinesh Chahal & Ors. Vs Union of India & Ors., it was observed that stack emissions are three time higher during start-up of firing process, irrespective of firing technology, which lasts for around 7 days. ***Therefore, it is recommended that even if there is enough supportive carrying capacity to operate all the zig-zag type brick kilns in any district, the start-up firing may be allowed in three batches of 33% of the total Zig-Zag type brick kilns which can be operated, with a gap of 7 days within two batches. This is to ensure that PM_{10} emission load in the ambient air mostly remains within assimilative carrying capacity***.

vii. ***In view of the carrying capacity limitations simultaneous operation of all the brick kilns may not be advisable, therefore, staggered permission for operation may be given to the existing brick***

kilns in such a way that only estimated number of brick kilns in area operate during any given time.

viii. ***However, all Zig-Zag brick kilns may be considered to perform upstream activities such as green brick manufacturing, stacking of green bricks, etc. during non-firing period.***

ix. In the districts, where ambient air quality data for the past is not available, due to non-availability of CAAQMS, the data of the districts having comparable population and geographical area, may be used for estimating the number of brick kilns which can be operated without affecting the ambient air quality.

x. ***In order to control fugitive dust emissions, adequate measures such as sprinkling of water must be taken and compliance of the conditions of the Consent to Operate/guidelines issued by concerned SPCB must be ensured.***

xi. References w.r.t. use of Piped Natural Gas (PNG), as fuel in brick manufacturing are available, but in Tunnel type brick Kilns. It is, therefore, recommended that a techno-economic feasibility study may be conducted by an expert agency, for making an assessment w.r.t. use PNG and other cleaner fuels such as internal fuels, with different types of firing technologies, for making brick manufacturing sustainable and environmental friendly, at locations where such fuels are available."

11. Considering the objections of the brick kilns owners, it was observed:-

"15. We are unable to find any substance in the objections. CPCB has duly explained that the Carrying Capacity is based on monthly average data on PM_{10} generated from CAAQMS and where no such data was available, Aerosol Optical Depths were extrapolated to PM. Further, carrying capacity has been assessed by taking mixing heights into consideration and comparing with identical air shed of districts geographical area and dispersion air volume conditions. With regard to emission load, the load is based on actually monitored values taking stack diameter, velocity, temperature and pressure of flue gases and standard of 250 mg/Nm 3 at 17% O 2. Overall fact is that entire NCR has no carrying capacity to take load of the pollution of the brick kilns as already levels of PM_{10} and $PM_{2.5}$ are exceeding daily/annual standards. As per Table 15 of the Report, no brick kiln has scope to operate except, some may, during March to June.

16. Other issues raised are no longer res integra and are covered against the objectors by the law laid down by the Hon'ble Supreme Court. Reference may be made to some of the judgements dealing with the issue.

Supreme Court judgments dealing with Air quality of NCR, Precautionery principle, control of pollution from one source hen there are multiple sources and enforcement of environment norms where right to trade is pleaded

17. In Arjun Gopal & Ors. v. UOI & Ors.[7]*, it was observed that the residents of NCR faced severe air quality standards which were worst in the World. It had serious adverse health impact. Life of citizens in NCR had been brought to virtual standstill. The Capital was smoked into an environmental emergency of unseen proportions. It will be appropriate to extract some observations from the judgment:-*

> *"4. The onset of winter and the festival/marriage season this year, presented to the residents of NCR severe concerns regarding the air quality standards. According to reports, the air quality standards in early November of this year were the worst in the world.* ***It is reported that the $PM_{2.5}$ levels recorded were "beyond scale" values (see India's Air Quality Among World's Worst Over Diwali Weekend: Report. 4-11-2016, Hindustan Times). The report indicates that 24-hour average of $PM_{2.5}$ levels in South Delhi in 2016 were 38% higher than on the Diwali night of 2015. The day after Diwali, these levels were twice as high as the day after Diwali in 2015, crossing 650 $\mu g/m^3$, which is 26 times above the WHO's standards or levels considered safe. Shockingly, on the morning of 1-11-2016, Delhi woke up to an average $PM_{2.5}$ level of over 700 $\mu g/m^3$ — some of the highest levels recorded the world over and 29 times above WHO standards. The report further states that the WHO guideline for 24-hour average $PM_{2.5}$ levels is 25 $\mu g/m^3$ and with an annual average $PM_{2.5}$ level of 122 $\mu g/m^3$, Delhi's air is the worst among global megacities with dense populations. We have particularly referred to the PM 2.5 levels because of the extreme effects and near invisibility of this type of particulate matter. $PM_{2.5}$ or particulate matter 2.5 ($PM_{2.5}$), refers to tiny particles or droplets in the air that are two-and-one-half microns or less in width. It may be noted that the widths of the larger particles in the $PM_{2.5}$ size range would be about thirty times smaller than that of a human hair. These particles primarily emanate from vehicle exhausts and other operations that involve the burning of fuels such as wood, heating oil or coal, and of course, use of fire crackers.***
>
> ***5. In India, air quality standards are measured in terms of the Air Quality Index (hereinafter "AQI"). The AQI was launched in India on 17-10-2014 by the Ministry of Environment and Forests. According to the press release of the Press information Bureau of the same date, it consists of a comprehensive set of parameters to monitor and asses the air quality. The AQI considers eight pollutants (PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, O_3, NH_3, and***

[7] (2017) 1 SCC 412

Pb), and based on the levels of these pollutants six categories of AQI ranging from "Good" to "Severe" have been prescribed. The index also suggests the health effects of the pollution categorywise. The gradation of AQI and its health impact is extracted below:

Tables 1 and 2 have already been reproduced in para 1 above and are not being repeated.

xxx.....xxx xxx
xxx.....xxx xxx

6. Reports indicate that AQI in Delhi was much above the severe standard, shooting off the AQI 500 mark on many days this November. On the day after Diwali, it was more than 14 times the safe limits (see Delhi's Pollution Levels Peaks at 14-16 Times Safe Limits, 31-10-2016, The Hindu). The adverse health effects of these hazardous levels of pollution are only too evident from the table given above. We do not intend to refer to the multiplicity of reports and data on this front.

7. The hazardous levels of air pollution in the last few weeks has spared very few from its ill effects. The life of the citizens of NCR was brought to a virtual standstill, not to speak about the plight of the thousands of mute flora and fauna in NCR. Schools were declared shut, denizens of the city advised to stay indoors, construction activities stopped, power stations shut and ban imposed on burning of garbage and agricultural waste. The fall in air quality has had a significant impact on people's lifestyle as well. The rising costs to protect against air pollution are substantial. It has come to our notice that people are queuing up to purchase protective masks and air purification systems in the wake of dense smog all over the NCR. In short, the capital was "smogged" into an environmental emergency of unseen proportions.

8. The adverse effects of these extreme levels of air pollution spare no one — the young, the old, the infirm and even the future generations. A study of the data of the Global Health Depository of the World Health Organisation reveals that India has the world's highest death rate from chronic respiratory diseases and that about 1.5 million people in India die annually due to indoor and outdoor pollution (see Delhi Wakes up to an Air Pollution Problem it cannot Ignore, 15-2-2015, The New York Times). The Kolkata-based Chittaranjan National Cancer Institute (CNCI), in a study commissioned and handed over to the Central Pollution Control Board, found that key indicators of respiratory health, lung function to palpitation, vision to blood pressure, of children in Delhi, between four and 17 years of age, were worse off than their counterparts elsewhere. It also found that more than 40% of the school children suffer from lung damage (see Landmark Study Lies Buried, 2-4-2015, The Indian Express). We note with

apprehension that there are nascent studies that suggest that pollution can lower children's IQ, hurt their test scores and increase the risks of autism, epilepsy, diabetes and even adult-onset diseases like multiple sclerosis (see Holding Your Breath in India, 29-5-2015, The New York Times).

9. It has been brought to our notice that the severe air pollution in the NCR is leading to multiple diseases and other health related issues amongst the people. It is said that the increase in respiratory diseases like asthma, lung cancer, bronchitis, etc. is primarily attributable to the worsening air quality in the NCR. The damage being caused to people's lungs is said to be irreversible. Other health related issues like allergies, temporary deafness are also on the rise. Various experts have pointed towards multiple adverse effects of air pollution on human health like premature deaths, rise in mortality rates, palpitation, loss of vision, arthritis, heart ailments, cancer, etc.

10. When we refer to these extreme effects, we are not merely referring to the inconvenience caused to people, but to abject deprivation of a range of constitutionally embedded rights that the residents of NCR ought to have enjoyed. Needless to state, the grim situation of air quality adversely affected the right to education, work, health and ultimately, the right to life of the citizens, and this Court is constitutionally bound to address their grave concerns. May we remind ourselves, that this is not the first time that this Court was impelled into ensuring clean air for the citizens of the capital region (see M.C. Mehta v. Union of India [M.C. Mehta v. Union of India, (1998) 6 SCC 60] , [M.C. Mehta v. Union of India, (1998) 9 SCC 589] , M.C. Mehta v. Union of India [M.C. Mehta v. Union of India, (1998) 8 SCC 648] and M.C. Mehta v. Union of India [M.C. Mehta v. Union of India, (1998) 8 SCC 206]).”

18. In the context of banning sale of crackers having adverse impact on the air quality, it was held that ***even if there were several sources of pollution, a particular polluting activity could be prohibited****. No equality could be pleaded in this regard. Right to trade was not absolute and could be restricted for protection of Environment which was a specific Directive Principle of State Policy enforcement of which was a reasonable restriction on fundamental right to trade. The ‘Precautionery Principle’ of environmental law allows prohibition of a polluting activity even in absence of scientific certainty. Relevant extracts are as follows:-*

“*37* ***The aforesaid findings are sufficient to negate the arguments of the opposite side that there is absence of scientific study*** *about the adverse effect of firecrackers during Diwali. In environmental law, “precautionary principle” is one of the well-recognised principles which is followed to save the environment. It is rightly argued by the petitioners that this principle does not need exact studies/material. The very word*

"precautionary" indicates that such a measure is taken by way of precaution which can be resorted to even in the absence of definite studies. In Vellore Citizens' Welfare Forum [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647], this Court explained the principle in the following manner: (SCC pp. 658 & 660, paras 11 & 14-16)

> *"11. Some of the salient principles of "Sustainable Development", as culled out from Brundtland Report and other international documents, are Inter-Generational Equity, Use and Conservation of Natural Resources, Environmental Protection, the Precautionary Principle, Polluter Pays Principle, Obligation to Assist and Cooperate, Eradication of Poverty and Financial Assistance to the developing countries. We are, however, of the view that "the precautionary principle" and "the polluter pays principle" are essential features of "Sustainable Development". The "precautionary principle" — in the context of the municipal law — means:*
>
> *(i) Environmental measures — by the State Government and the statutory authorities — must anticipate, prevent and attack the causes of environmental degradation.*
>
> *(ii)* ***Where there are threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.***
>
> *(iii) The "onus of proof" is on the actor or the developer/industrialist to show that his action is environmentally benign.*
>
> ***
>
> *14. In view of the abovementioned constitutional and statutory provisions we have no hesitation in holding that the precautionary principle and the polluter pays principle are part of the environmental law of the country.*
>
> *15. Even otherwise once these principles are accepted as part of the Customary International Law there would be no difficulty in accepting them as part of the domestic law. It is almost an accepted proposition of law that the rules of Customary International Law which are not contrary to the municipal law shall be deemed to have been incorporated in the domestic law and shall be followed by the courts of law. To support we may refer to H.R. Khanna, J.s' opinion in ADM, Jabalpur v. Shivakant Shukla [ADM, Jabalpur v. Shivakant Shukla, (1976) 2 SCC 521] , Jolly George Varghese case [Jolly George Varghese v. Bank of Cochin, (1980) 2 SCC 360] and Gramophone Co. case [Gramophone Co. of India Ltd. v. Birendra Bahadur Pandey, (1984) 2 SCC 534 : 1984 SCC (Cri) 313] .*
>
> *16. The constitutional and statutory provisions protect a person's right to fresh air, clean water and pollution-free environment, but the source of the right is the inalienable common law right of clean environment. …"*

38. The precautionary principle accepted in the aforesaid judgment was further elaborated in A.P. Pollution Control Board case [A.P. Pollution Control Board v. M.V. Nayudu, (1999) 2 SCC 718] as under: (SCC pp. 732-34, paras 31-35)

"31. The "uncertainty" of scientific proof and its changing frontiers from time to time has led to great changes in environmental concepts during the period between the Stockholm Conference of 1972 and the Rio Conference of 1992. In Vellore Citizens' Welfare Forum v. Union of India [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] a three-Judge Bench of this Court referred to these changes, to the "precautionary principle" and the new concept of "burden of proof" in environmental matters. Kuldip Singh, J. after referring to the principles evolved in various international conferences and to the concept of "sustainable development", stated that the precautionary principle, the polluter pays principle and the special concept of onus of proof have now emerged and govern the law in our country too, as is clear from Articles 47, 48-A and 51-A(g) of our Constitution and that, in fact, in the various environmental statutes, such as the Water Act, 1974 and other statutes, including the Environment (Protection) Act, 1986, these concepts are already implied. The learned Judge declared that these principles have now become part of our law. The relevant observations in Vellore case [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] in this behalf read as follows: (SCC p. 660, para 14)

'14. In view of the abovementioned constitutional and statutory provisions we have no hesitation in holding that the precautionary principle and the polluter pays principle are part of the environmental law of the country.'

The Court observed that even otherwise, the abovesaid principles are accepted as part of the customary international law and hence there should be no difficulty in accepting them as part of our domestic law. In fact, on the facts of the case before this Court, it was directed that the authority to be appointed under Section 3(3) of the Environment (Protection) Act, 1986

'shall implement the "precautionary principle" and the "polluter pays principle"'.

The learned Judges also observed that the new concept which places the burden of proof on the developer or industrialist who is proposing to alter the status quo, has also become part of our environmental law.

32. The Vellore [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] judgment has referred to these principles briefly but, in our view, it is necessary to explain their meaning in more detail, so that courts and tribunals or environmental authorities can properly apply the said principles in the matters which come before them.

33. ***A basic shift in the approach to environmental protection occurred initially between 1972 and 1982. Earlier, the concept was based on the "assimilative capacity" rule as revealed from Principle 6 of the Stockholm Declaration of the U.N. Conference on Human Environment, 1972. The said principle assumed that science could provide policy-makers with the information and means necessary to avoid encroaching upon the capacity of the***

environment to assimilate impacts and it presumed that relevant technical expertise would be available when environmental harm was predicted and there would be sufficient time to act in order to avoid such harm. But in the 11th Principle of the U.N. General Assembly Resolution on World Charter for Nature, 1982, the emphasis shifted to the "precautionary principle", *and this was reiterated in the Rio Conference of 1992 in its Principle 15 which reads as follows:*

'Principle 15.—In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for proposing cost-effective measures to prevent environmental degradation.'

34. In regard to the cause for the emergence of this principle, Charmian Barton, in the article earlier referred to in "The Status of the Precautionary Principle in Australia" [(1998) 22 Harvard Environmental Law Review 509 at p. 547] says:

'There is nothing to prevent decision-makers from assessing the record and concluding that there is inadequate information on which to reach a determination. If it is not possible to make a decision with "some" confidence, ***then it makes sense to err on the side of caution and prevent activities that may cause serious or irreversible harm****. An informed decision can be made at a later stage when additional data is available or resources permit further research. To ensure that greater caution is taken in environmental management, implementation of the principle through judicial and legislative means is necessary.'*

In other words, the inadequacies of science is the real basis that has led to the precautionary principle of 1982. It is based on the theory that it is better to err on the side of caution and prevent environmental harm which may indeed become irreversible.

35. The principle of precaution involves the anticipation of environmental harm and taking measures to avoid it or to choose the least environmentally harmful activity. It is based on scientific uncertainty. Environmental protection should not only aim at protecting health, property and economic interest but also protect the environment for its own sake. Precautionary duties must not only be triggered by the suspicion of concrete danger but also by (justified) concern or risk potential. The precautionary principle was recommended by the UNEP Governing Council (1989). The Bomako Convention also lowered the threshold at which scientific evidence might require action by not referring to "serious" or "irreversible" as adjectives qualifying harm. However, summing up the legal status of the precautionary principle, one commentator characterised the principle as still "evolving" for though it is accepted as part of the

international customary law, 'the consequences of its application in any potential situation will be influenced by the circumstances of each case'. (See First Report of Dr. Sreenivasa Rao Pemmaraju — Special Rapporteur, International Law Commission dated 3-4-1998, paras 61 to 72.)"

(emphasis in original)

39. In such cases which pertain to the protection of environment, thrusting of "onus of proof" on the developer/industrialist in Vellore Citizens' Welfare Forum [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] was also elaborated by the Court in the following manner: (A.P. Pollution Control Board case [A.P. Pollution Control Board v. M.V. Nayudu, (1999) 2 SCC 718] , SCC pp. 734-35, paras 36-38)

"36. We shall next elaborate the new concept of burden of proof referred to in Vellore case [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] at p. 658. In that case, Kuldip Singh, J. stated as follows: (SCC p. 658, para 11)

'(iii) The "onus of proof" is on the actor or the developer/industrialist to show that his action is environmentally benign.'

37. It is to be noticed that while the inadequacies of science have led to the "precautionary principle", the said "precautionary principle" in its turn, has led to the special principle of burden of proof in environmental cases where burden as to the absence of injurious effect of the actions proposed, — is placed on those who want to change the status quo (Wynne, "Uncertainty and Environmental Learning: Reconceiving Science and Policy in the Preventive Paradigm" [(1992) 2 Global Environmental Change 111 at p. 123]). This is often termed as a reversal of the burden of proof, because otherwise in environmental cases, those opposing the change would be compelled to shoulder the evidentiary burden, a procedure which is not fair. Therefore, it is necessary that the ***party attempting to preserve the status quo by maintaining a less polluted state should not carry the burden of proof and the party who wants to alter it, must bear this burden.*** *(See James M. Olson, "Shifting the Burden of Proof: How the Common Law can Safeguard Nature and Promote an Earth Ethic" [(1990) 20 Environmental Law 891 at p. 898] .) (Quoted in "The Status of the Precautionary Principle in Australia" [(1998) 22 Harvard Environmental Law Review 509 at p. 547] at pp. 519, 550.)*

38. The precautionary principle suggests that where there is an identifiable risk of serious or irreversible harm, including, for example, extinction of species, widespread toxic pollution in major threats to essential ecological processes, it may be appropriate to place the burden of proof on the person or entity proposing the activity that is potentially harmful to the environment. (See Report of Dr

Sreenivasa Rao Pemmaraju, Special Rapporteur, International Law Commission, dated 3-4-1998, Para 61.)"
(emphasis in original)

41. It may be stressed that in Vellore Citizens' Welfare Forum case [Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647] , this Court had banned the tanneries when it was found that they were causing immense damage to the environment. Thus, environment protection, which is a facet of Article 21, was given supremacy over the right to carry on business enshrined in Article 19(1)(g). We state at the cost of repetition that right to health, which is recognised as a facet of Article 21 of the Constitution and, therefore, is a fundamental right, assumes greater importance. It is not only the petitioners and other applicants who have intervened in support of the petitioners but the issue involves millions of persons living in Delhi and NCR, whose right to health is at stake. However, for the time being, without going into this debate in greater details, our endeavour is to strive at balancing of two rights, namely, right of the petitioners under Article 21 and right of the manufacturers and traders under Article 19(1)(g) of the Constitution.

44. Applying the aforesaid principle, in the first blush it may appear that the aforesaid argument has substantial force in it. However, that would be only one side of the picture as there are two contra-arguments which are sufficient to take the sheen out of the aforesaid plea. First aspect is that the argument of economic hardship is pitched against right to health and life. ***When the Court is called upon to protect the right to life, economic effect of a particular measure for the protection of such right to health will have to give way to this fundamental right. Second factor, which is equally important, is that the economic loss to the State is pitched against the economic loss in the form of cost of treatment for treating the ailments with which people suffer as a result of burning of these crackers. Health hazards in the form of various diseases that are the direct result of burning of crackers have already been noted above. It leads to asthma, coughing, bronchitis, retarded nervous system breakdown and even cognitive impairment. Some of the diseases continue on a prolonged basis. Some of these which are caused because of high level of $PM_{2.5}$ are even irreversible. In such cases, patients may have to continue to get the medical treatment for much longer period and even for life****. Though there are no statistics as to what would be the cost for treating such diseases which are as a direct consequence of fireworks on these occasions like Diwali, it can safely be said that this may also be substantial. It may be more than the revenue which is generated from the manufacturers of the crackers. However, we say no more for want of precise statistical data in this behalf."*

Carrying Capacity Concept

19. Carrying capacity is a facet of sustainable development. It is inherent in 'Precautionary Principle' as well as in 'Inter-generational Equity'. In MC Mehta v. UOI & Ors.[8]*,* ***construction activity in the catchment area of Badkhal were directed to be restricted/regulated to the level of Carrying capacity.*** *It was observed that:-*

> ***"Preventive measures have to be taken keeping in view of the carrying capacity of the ecosystem operating in the environmental surroundings under consideration."***

20. In Vellore Citizens' Welfare Forum v. UOI & Ors.[9]*, it was observed that quality of human life is to be improved within the carrying capacity to supporting ecosystem. Relevant extract is as follows:-*

> ***"****10……. **During the two decades from Stockholm to Rio "Sustainable Development" has come to be accepted as a viable concept to eradicate poverty and improve the quality of human life while living within the carrying capacity of the supporting ecosystems**. "Sustainable Development" as defined by the Brundtland Report means "Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs". We have no hesitation in holding that "Sustainable Development" as a balancing concept between ecology and development has been accepted as a part of the customary international law though its salient features have yet to be finalised by the international law jurists.**"*

21. These observations are reiterated in (2006) 6 SCC 371.[10]

Pollution from Brick kilns – shifting from coal to Natura gas as fuel

22. In M.C. Mehta (Taj Trapezium Pollution) v. UOI & Ors.[11]*, the Hon'ble Supreme Court held that pollution caused by brick kilns in Taj Trapezium area was harmful to the Taj. Brick kilns within radius of 20 km were directed to be closed/relocated and replacement of the fuel by natural gas was suggested.*[12]

CNG replaced for diesel as fuel, closing Thermal Plant and controlling carbon emitting activities to control pollution

23. In M.C. Mehta v. UOI & Ors.[13] *the issue for consideration was vehicular pollution on account of use of diesel considering the constitutional obligation, adverse impact of air pollution on health, the Hon'ble Supreme Court directed allocation of CNG and replacement of*

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[8] (1997) 3 SCC 715
[9] (1996) 5 SCC 647
[10] Para 66 to 76
[11] (2001) 9 SCC 235
[12] Para 1 & 2
[13] (2002) 4 SCC 356

diesel vehicles of CNG.[14] In M.C. Mehta v. UOI & Ors.,[15] various directions were issued to deal with the adverse air quality in Delhi including phasing out of old vehicles, ***closing Badarpur Thermal Power Station*** *increasing Metro frequency, stopping burning of waste, vacuum cleaning of roads.*

Tribunal's Approach to the subject

24. The Tribunal has a mandate to follow these principles under Section 20 read with Section 15 of the National Green Tribunal Act, 2010 and can issue appropriate directions for enforcement of these principles, as laid down in Mantri Techzone Pvt. Ltd. v. Forward Foundation and Ors.,[16] and the Director General (Road Development) NHAI v. Aam Aadmi Lok Manch.[17] Environmental rule of law requires strict enforcement of these principles as laid down in Hanuman Laxman Aroskar v. UOI).[18]

25. This Tribunal in O.A. No. 681/2018, vide order dated 21.08.2020, dealt with the remedial measures for restoration of air quality in 122 Non-attainment cities, including Delhi where air quality is generally beyond norms. The Tribunal directed stopping polluting activities, including brick kilns and assessment of carrying capacity of urban areas to take policy decisions to control polluting potential activities beyond carrying capacity. The Tribunal observed:-

> *"3. The Tribunal noted the concern arising from such large scale air pollution which grapples the country in spite of statutory mechanism under the Air Act, directions of the CPCB under section 18(1)(b), dated 29.12.2015 and directions of the Hon'ble Supreme Court for control of* ***vehicular pollution[19], industrial and construction sector pollution[20], power sector pollution[21] and agricultural sector pollution[22]*** *and orders of this Tribunal dealing with the said issues[23]. The*

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[14] Para 1,3,11,21 to 24, 26 & 29

[15] (2016) 4 SCC 269

[16] 2019 SCC online SC 322, Para 43-47

[17] AIR 2020 (SC) 3471, Para 75

[18] (2019) 15 SCC 401

[19] Rural Litigation and Entitlement Kendra, Dehradune and Others Vs State of U.P. Others (1985) 2 SCC 431, M.C. Mehta v. Union of India (2001) 3 SCC 756, M.C. Mehta v. Union of India (1998) 6 SCC 63, M.C. Mehta v. Union of India (2002) 4 SCC 356, M.C. Mehta v. Union of India (1998) 6 SCC 60

[20] M.C. Mehta v. Union of India (1997) 2 SCC 353, M.C. Mehta v. Union of India and Shriram Foods and Fertilizer Industries and Anr. (1986) 2 SCC 176, Rural Litigation and Entitlement Kendra, Dehradun v. State of U.P. (1985) 2SCC 431, Mohd. Haroon Ansari v. District Collector (2004) 1 SCC 491, Union of India v. Union Carbide Co. (1989) 1 SCC 674, M.C. Mehta v. Union of India (1992) 3 SCC 256, Sterlite Industries (India) Ltd. etc. v. Union of India & Ors.(2013) 4SCC 575 , M.C. Mehta v. Union of India (2004) 6 SCC 588, M.C. Mehta v. Kamal Nath (2000)6 SCC 213

[21] Consumer Education and Research Centre v. Union of India (1995)3 SCC 42, Dahanu Taluka Environment Protection group and Ors. v. Bombay Suburban Electricity Supply Company Ltd. and Ors (1991) 2SCC 539

[22] Arjun Gopal and Ors v. Union of India and Ors (2017) 16 SCC 280, Dr. B.L Wadhera v. Union of India and Ors (1996) 2 SCC 594

[23] Vardhman Kaushik v. Union of India and Ors. O.A no. 21 of 2014, Vikrant Kumar Tongad v. Environment Pollution (Prevention and Control) Authority and Ors, O.A No. 118 of 2013, Satish Kumar v. Union of India and Ors, O.A. No. 56 (T_{HC}) OF 2013, Smt. Ganga Lalwani V. Union of India and Ors. O.A No. 451 of 2018

Tribunal also referred to a Comprehensive Action Plan (CAP) for air pollution control for NCR prepared in pursuance of order of the Hon'ble Supreme Court dated 06.2.2017 by the Environment Pollution (Prevention and Control) Authority (EPCA) in consultation with the CPCB and Delhi Pollution Control Committee (DPCC) on 05.04.2017[24] and Graded Response Action Plan (GRAP) notified by the MoEF&CC on 12.01.2017 stipulating specific steps for different levels of air quality such ***as improvement in emission and fuel quality and other measures for vehicles, strategies to reduce vehicle numbers, non-motorised transport network, parking policy, traffic management, closure of polluting power plants and industries including brick kilns, control of generator sets, open burning, open eateries, road dust, construction dust, etc.[25]***

4. Implementation of prescribed norms in the light of legal provisions and court directions remains a challenge. The consequence is that India is being ranked high in terms of level of pollution compared to many other countries with enormous adverse impact on public health. Most victims are children, senior citizens and the poor.[26]

5. The GRAP categorises levels of pollution as severe plus, severe, very poor, moderate to poor. The action to be taken in such situations includes stopping entry of trucks, stopping construction activities, odd and even scheme of private vehicles, shutting of schools, closing of brick kilns, stone crushers, hot mix plants, power plants, intensifying public transport services, mechanized cleaning of road, and sprinkling of water, stopping the use of diesel generator sets, enhancing parking fees, etc.

6. The MoEF&CC has by various notifications put restrictions on activities in Coastal areas, Flood plains, Taj corridor Eco-sensitive zones, etc. in view of ecological sensitivity and impact of such activities on environment if such activities are carried out in unregulated areas. This needs to be extended to the NACs in view of impact on public health and environment to give effect to the 'Precautionary' and 'Sustainable Development' principles."

7to13..xxx……xxxx……xxx

14. According to the CPCB, draft framework has been prepared and SA study completed in four States (for 05 cities). Study was under progress in 14 States (for 54 cities), and at proposal stage in 10 States (for 37 cities). Methodology for carrying capacity has been shared with State PCBs/PCCs. Twelve (12) States/UTs have given the details of the carrying

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[24] Report No.71, EPCA-R/2-17/L-21, Comprehensive Action Plan for air pollution control with the objective to meet ambient air quality standards in the National Capital Territory of Delhi and National Capital Region, including states of Haryana, Rajasthan and Uttar Pradesh.

[25] S.O.118(E), Notification, Ministry of Environment, Forest and Climate Change

[26] https://www.thehindu.com/sci-tech/energy-and-environment/india-ranks-177-out-of-180-in-environmental-performance-index/article22513016.ece, https://www.ndtv.com/delhi-news/delhis-air-pollution-has-caused-of-death-of-15-000-people-study-1883022.

*capacity and the remaining have yet to take necessary steps. CC/SA studies are pre requisite for meaningful planning to enforce environmental law. This pre-requisite should have been undertaken long ago. Air quality norms have been statutorily laid down under the Air (Prevention and Control of Pollution) Act, 1981 as well as the Environment (Protection) Act, 1986 and such norms are being flagrantly violated, which has been made by the Parliament a criminal offence. If the rule of law has to have meaning and guilty are to be punished, the policies of the State have to be based on scientific studies to contain polluting activities within the scope of Carrying Capacity.***"***

26. Dealing with the issue of air pollution in manufacture of tiles at Morbi in Gujrat, vide order dated 6.3.2019 OA 20/17 Babubhai v GPCB, this Tribunal directed closure of industries operating with coal unless they shifted to natural gas. This was referred in the earlier order of this Tribunal in the present matter. It was further observed that while under the orders of the Hon'ble Supreme Court, GRAP was laid down providing for closing of specified activities on crossing of air quality norms as laid down in the GRAP, the same did not debar consideration of further situations requiring closure/regulation.

Conclusion

27. Thus, in view of report of the CPCB, at this stage ***it is not possible to vacate direction not to permit operation of brick kilns in NCR beyond the carrying capacity found by the CPCB. All applications of the brick kiln owners seeking rejection of CPCB report and vacation of interim order against operation of brick kilns, without air quality assimilative capacity permitting such activity will stand rejected subject to further exploring viable options, including change to clean fuel like natural gas****. We are conscious that brick kilns may be necessary. Object of this order is not to stop any legitimate business activity but to enforce the right to breathe fresh air which is right to file. The source apportionment studies, placed on record, show that brick kilns contribute 5-7% PM. Air pollution Control devices to be installed by the polluting sources including the brick kilns need to comply not only the consent standards but are also the Ambient Air Quality norms and available assimilative capacity of the region.* ***If the right to fresh air is not enforced, the consequences of brick kilns beyond carrying capacity of the air quality in the area are disastrous in terms of deaths and air borne diseases. This will be contrary to the mandate of the Constitution and the environmental law, particularly the principle of 'Sustainable Development'. It is well established that deteriorated ambient air quality in terms of PM_{10} and $PM_{2.5}$ affects respiratory system particularly, the lungs which may make individuals more vulnerable to get other related fatal diseases****.*[27]

28. Accordingly, we direct CPCB to constitute a Committee of five experts to suggest ways and means, if any, by which sustenance of brick kilns activities may be viable. It will be

[27] https://airqualitynews.com/2020/08/13/the-link-between-air-pollution-and-covid-19/http://www.babushahi.com/full-news.php?id=107487

open to CPCB to nominate in-house or other Experts. The CPCB may also explore viability of PNG as replacement of coal and other best practices in terms of fuel used, at other places or in other Countries. It will be open to the brick kilns owners/associations to give any other suggestions or alternatives for consideration by CPCB in spirit of collaboration with a view to find a solution within two weeks from today. Subject to the report of the expert Committee finding it viable, possibility of permitting operation of brick kilns, having regard to the extent of pollution load and its effect on the air pollution level in NCT of Delhi may be considered. The CPCB may constitute an expert Committee within three weeks which may give its report within six weeks thereafter. Further report may be furnished in the matter before the next date 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."

12. As mentioned earlier, the CPCB has filed its further report dated 08.02.2021, stating that it constituted a five-member Committee of following members:-

- Mr. Mohan A Patil, Senior Director, **Federation of Indian Chambers of Commerce & Industry (FICCI),** New Delhi
- Dr Sameer Maithel, Director, Greentech Knowledge Solutions Pvt. Ltd (GKSPL), New Delhi
- Dr. Neeraj Jain, Principal Scientist, CSIR-**Central Building Research Institute**, Roorkee
- Er Pritpal Singh, Additional Director, Punjab State Council for Science and Technology (PSCST), Chandigarh
- Dr. Narender Sharma, Scientist 'E', Central Pollution Control Board (CPCB).

13. The Committee was to suggest ways and means to sustain brick kilns activities. However, **in terms of order of this Tribunal dated 15.10.2020, paras 27 and 28, the scope of the Committee was limited to examine ways and means for sustainability of brick kilns activities either by replacing the fuel or any other such alternatives as enable**

pollution free brick kiln activities in 'severe' conditions. It seems the Committee has misunderstood its mandate and, on suggestion of brick kilns, made recommendations without concern for the pollution load which air quality during 'severe' condition cannot take. Its suggestions of improving monitoring and operation procedures is not enough to accept that in practical terms, there will be no pollution load. Such measures may be at best helpful only where air quality is not 'severe' and only issue is mitigating measures. The summary of observations and recommendations of the Committee are as follows:-

> ***"2.2 Preventing/ Reducing Air Pollution Generation at Source in Existing zig-zag kilns***
>
> ***Adoption of Standard operating practices for zig-zag kiln operation:*** *Representations by brick kiln associations and presentations made by them during the January 4, 2021 meeting, revealed that a large number of brick kilns which have recently converted from FCBTK to zig-zag kiln technology, are not familiar with the standard operating practices and also face a problem of non-availability of trained workers (firemen and brick setters) to operate zig-zag kilns. Sample surveys and performance measurements conducted immediately after conversion from FCBTK to zig-zag kilns carried out in Bihar[28] & NCR[29] corroborate the fact that all newly converted zig-zag kilns may not be following standard operating practices resulting in them not being able to achieve the desired level of performance with respect to reduced air pollution, fuel savings and improved quality of fired bricks. The Expert Committee has compiled the Standard Operating Practices, and are presented in* ***Annexure-4*** *which covers the following aspects:*
>
> - *Stacking of bricks in a zig-zag kiln*
> - *Fuel preparation and fuel feeding practices in a zig-zag kiln*
> - *Air leakage management in a zig-zag kiln*
> - *Temp. measurement & instrumentation to control the operation of a zig-zag kiln*
> - *Air flow and draught control in a zig-zag kiln.*
>
> *The expert committee also deliberated on various measures as elaborated in* ***Annexure- 5****, to improve the combustion of fuel and thus reduction in source emissions:*

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[28] GKSPL 2018: Learnings from Bihar's Experience of Implementing Cleaner Brick Kiln Directive: A Case Study, Greentech Knowldeg Solutiosn Pvt. Ltd. Delhi. https://www.gkspl.in/wp-content/uploads/2019/01/Learnings-trom-Bihar-Experience-ot-Implementing-Cleaner-Brick-Kiln-Directive A Case Study pdf

[29] CSE 2018: Conversion of Brick Kilns in Delhi: NCR to Clean Technology: A Status Report, Centre for Science & Technology https://www.cseindia.org/makeover-conversion-of-brick-kilns-in-dehi-ncr-to-a-cleaner-technoiogy-8843

i. *Optimising Combustion & Minimising Air Leakages by Using Instrumentation and Process Control System.*
ii. *Increasing Settling of Dust in Flue Ducts (in-built Settling Chamber) by reducing Air Leakages.*
iii. *Use of Internal Fuel.*
iv. *Use of mechanized fuel feeding devices.*

2.3. Preventing/ Reducing Air Pollution Generation at Source by Change of Brick Kiln Technology and/or shift to cleaner gaseous fuels Tunnel Kiln Technology: *Tunnel kiln is a continuous moving ware kiln in which the bricks are passed on cars through a long horizontal tunnel. The firing of products occurs at the central part of the tunnel. The main advantages of tunnel kiln technology lie in its ability to fire a wide variety of clay products, better control over the combustion/ firing process and high quality of the products. Due to the better control over the combustion process, the emission of particulate matter in stack gas is lower in tunnel kilns. After Second World War, the technology was widely adopted and lead to the transformation of European brick industry from several thousand small and scattered brick making units into few hundred large scale and highly mechanised tunnel kiln units. In Asia, China and Vietnam started adopting the technology during 1970's and now have several hundred tunnel kilns in operation. Depending on its design and construction a tunnel kiln to manufacture around 50,000 bricks per day can cost anywhere between Rs. 7-15 crore in India. As per information available with the Expert Committee there are only 1-2 operating tunnel kilns in the NCR which are mainly producing Value Added Products.*

PNG/CNG: *Gaseous fuels like piped natural gas, compressed natural gas or biogas are cleaner fuels which results in less air pollution as well as they also help in reducing CO_2 emissions. Recently, Wienerberger India (a large international company involved in manufacturing of bricks), has converted their existing tunnel kiln located at Kunigal, Karnataka to natural gas firing. CPCB was also directed by Hon'ble NGT to look into alternate fuels such as PNG. In this regard, CPCB Regional Directorate, Bangalore was requested to study and conduct in depth monitoring of a PNG based brick kiln namely M/s Weinberger Building Material Solutions operating at Plot No. 1 & 2, Kunigal Industrial Area, Phase II, Gottigere Village, Kunigal, Karnataka. The study has been conducted by CPCB RD, Bangalore on 22-23 December, 2020 and the report is enclosed as* ***Annexure-6****. The techno-economics of supply of natural gas for brick firing will require a detailed study.*

Air Pollution Control Devices (End-of-the Pipe Technologies): *The Expert Committee is of the view that zig-zag technology itself is adequate to achieve the existing and proposed norms prescribed for brick kilns, if operated as per design parameters.*

Further, the technology selection for an air pollution control device depends on characteristics of the pollutant(s) i.e. particle size, particle loading, required pollutant(s) removal efficiencies and flue gas properties like pressure, temperature, humidity, composition, reactivity etc. The various types of Air Pollution Control Devices (APCD) and their applications are tabulated as ***Annexure-7****.*

2.4. Applied research/pilot testing for improvement in brick manufacturing process

Based on the discussions presented above, various suggestions have been made by the Expert Committee as elaborated in ***Annexure-8****, for undertaking applied research to demonstrate and pilot test technical measures to improve brick manufacturing process and to reduce air pollution/improve resource efficiency.*

3. Summary of Observations:

The Expert Committee was directed by Hon'ble NGT, to suggest ways and means, if any, by which sustenance of brick kilns activities, may be viable. The summary of observations and analysis made by the Expert Committee in Section 2, so as to ensure environmentally sustainable and financially viable operation of brick kilns which have already been converted to zig-zag technology, in NCR districts of Haryana, Uttar Pradesh and Rajasthan is as follows:

a) *As per data available as on 16.12.2020 with CPCB based on the information received from respective SPCBs, out of total 4635 Nos. brick kilns in NCR, 2697 Nos. brick kilns (Uttar Pradesh: 1024 Nos.; Haryana: 1543 Nos. and Rajasthan: 216 Nos.) have been converted to Zig-zag technology, as on date (****Table 1****).*

Table 1: *Conversion status of brick kilns from Fixed Chimney Bull Trench Kiln (FCBTK) technology to Zig-zag technology in NCR Regions*

S.No.	*Name of State*	*No. of Total no. of brick kilns*	*Total Brick Kilns converted into Zig-Zag Technology*
1	*Uttar Pradesh*	*2216*	*1024*
2	*Haryana*	*2163*	*1543*
3	*Rajasthan*	*255*	*216*
TOTAL		*4634*	*2783*

b) *The zig-zag kiln technology,* ***if operated as per standard operating practices,*** *are adequate to achieve both the existing norms of 750 mg/Nm^3 SPM and the proposed stricter norms of 250 mg/Nm^3 at 17% oxygen concentration (as per the draft notification of MoEF&CC vide No. GSR 233 (E) dated 15/3/2018).*

c) *Several* ***additional measures for incremental improvements undertaken to further reduce stack emission generation at source from can be existing zig-zag kilns as well as improve resource use efficiency so as to further reduce the environment footprint of the brick industry. These include, optimizing combustion & minimizing air leakages by using instrumentation and process control system; increasing settling of dust in flue ducts (in-built Settling Chamber) by reducing air leakages; use of VFDs for air flow and draught control; addition of internal fuel etc. These measures require further applied research/pilot demonstration****, as elaborated in Annexure-5 and Annexure-8 of the report, before they can be recommended for large-scale implementation.*

d) *As such, implementation of additional Air Pollution Control Devices (APCDs) are not required in zig-zag technology to meet the existing and proposed norm if operated as per design parameters as well as standard operating procedures. However, for further reduction in stack emission with special reference to reduce PM 10 and PM 2.5,* ***suitable APCD may be designed and piloted****.*

e) Regarding the use of PNG/CNG in brick kilns, there is only one reference of PNG based brick kiln in India i.e. M/s Weinberger Building Material Solutions operating at Village Kunigal, Karnataka installed at a cost of Rs. 150 Crores, using tunnel kiln technology, for producing hollow blocks. The Expert Committee is of the opinion that the conversion of Zig-zag kilns into PNG/CNG based tunnel kilns does not seem to be a viable option, at this stage.

f) *The measurement of stack emissions at 8D (Where D is the internal diameter of the chimney) level, as specified in USEPA/ CPCB method may not be feasible in some brick kilns having large diameters.* ***CPCB should relook into the current methodology of stack emission monitoring in brick kilns and come out with a guideline on how to conduct stack emission monitoring in zig-zag brick kilns.*** *Such a guideline and subsequent monitoring using these guidelines are important to reassess/revalidate the emission load and contribution of particulate matter emissions by zig-zag brick kilns in ambient air environment.*

4. Recommendations of Expert Committee

The following mechanism is recommended by the Expert Committee, for operationalization of zig-zag type brick kilns in NCR regions:

i. *The brick kilns which have already been converted to Zig-zag technology may only be allowed to operate,* ***subject to the compliance of all the applicable environmental notifications, sitting guidelines, conditions of the consent to operate granted by respective State Pollution Control Boards (SPCBs) with special reference to control of fugitive dust emissions****.*

ii. ***The new brick kilns be allowed to operate in NCR regions, as per directions issued by CPCB vide CPCB/IPC I-VI/PNG/2862-2870 dated November 27, 2020*** *(Copy attached as* ***Annexure-10****).*

iii. The permission to operate the brick kilns in the winter months must be subjected to the restrictions, if any, on the operation of industries, to control the concentration of particulate matter in the ambient air environment of Delhi NCR

iv. *The CPCB in consultation with expert agencies/organisations should develop methodology for conducting stack emission monitoring in zig-zag brick kilns at monitoring the earliest. All brick kilns would be required to provide port holes and platform and ladders as finalized by CPCB.*

v. *It is recommended that training programmes on standard operating practices may be organized by various brick kiln associations in collaboration with expert agencies in this field. CPCB may provide technical guidance to the brick kilns associations in this regard, if required. An outline of the training programme is provided in* ***Annexure-9****.*

vi. *It is recommended to implement the following additional measures:*

- *One night-vision CCTV camera to be installed and focused on the exit of brick kilns stack with connectivity to SPCBs & CPCB, to ensure visual monitoring of smoke emissions.*
- *Requisite number of ambient air quality monitoring stations (AAQMS) should be installed by State Pollution Control Boards in all the districts in accordance with the criteria developed by CPCB.*

vii. *The long term sustenance of the brick kilns in NCR depends on implementation of measures* ***to further improve design and operation of existing zig-zag kilns for pollution prevention at source and improve resource use efficiency****. The committee has given suggestions, based on which applied research and pilot demonstration can be taken up besides developing a Roadmap for time bound implementation."*

14. The report also annexes a study of *Tunnel kiln* technology, using PNG as fuel, employed by M/s Wienerberger Building Solutions Private Limited, KIADB Industrial Area, Kunigal, Karnataka, **(which has not been found viable by the Committee),** as follows:-

"5.0 Plant Description:

M/s Wienerberger Building Materials Solutions Private Limited, a Brick Manufacturer founded in 1819 in Vienna, Austria, is having 204 plants spread across 30 countries, is engaged in using natural, eco-friendly building material of international quality standards. The unit located in Plot No. 1 & 2, Kunigal Industrial Area, Phase II, Gottikere Village, Kunigal, Karnataka has Tunnel kiln, a continuous moving ware kiln technology. Wienerberger at Kunigal is the production facility, 70 kms from Bangalore, is Austria-based Wienerberger's first Asian manufacturing unit. The fully automated, state-of-the-art facility manufactures bricks called porotherm perforated clay bricks. The environment friendly production unit runs 365 days a year, producing 450 tonnes of bricks per day. Quality is ensured by the latest European production equipments 24 hour factory production control with in-house laboratory for chemical and physical tests of raw materials and finished products. The unit makes different types of horizontal and vertical perforated light weight clay bricks. The porotherm horizontally perforated light weight clay bricks has following advantages:

- *Weighs 60 % less than conventional walling material*
- *Compressive strength ≥3.5 N/mm^2*
- *Density of approx. 700-800kg/m^3*
- *Conveniently large and light weight bricks*
- *Excellent thermal insulation*
- *Low water absorption ~ 15%*

Brick is a 100 % natural clay product with natural additives like coal ash, rice husk and granites slurry. No toxic or any chemical additives are used, thereby free from toxic gases."

15. The report also refers to direction issued by the CPCB on 27.11.2020 under Section 18 (1) (b) of the Air (Prevention & Control of Pollution) Act, 1981 for upcoming industrial units in NCR **to use only gas** and also refers to an earlier order requiring even the existing industries in NCR Delhi, **to shift to PNG by 31.03.2019 where gas supply is available**. The relevant part of the order is quoted below:-

"xx xx xx xx xx

Whereas, considering the Considering deteriorating air quality in NCR-Delhi and also the fact that ***already directions have been issued to all the existing industries in NCR-Delhi to switch over to cleaner fuels, it is decided that only those new industrial units shall be allowed to set-up in NCR-Delhi, which use cleaner fuels namely, natural gas (PNG/CNG), liquefied petroleum gas, bio gas, propane, butane etc. and***

Now therefore, in view of the above and exercising the powers conferred under section 8(1)(b) of Air (Prevention and Control of Pollution) Act, 1981, you are hereby directed to allow only those new industrial units in NCR-Delhi, which are using cleaner fuels, namely, natural gas (PNG/CNG), liquefied petroleum gas, bio-gas, propane, butane etc."

16. We have heard Counsel for the brick kiln operators at great length and also perused the written submissions filed by them but their effort being to revisit the earlier order against which their appeal stands dismissed, we do not find any reason to pass any different order. As already observed in the beginning of this order, the data in Table 15 in the CPCB report shows that in severe air quality condition, coal fired brick kilns using zig zag technology are not sustainable in view of carrying capacity of the region. **Only from March to June, limited number of brick kilns operated by zig zag technology can be permitted**. Thus, unless there is change to cleaner fuel (PNG), brick kilns beyond the capacity shown by Table 15 above cannot be allowed.

17. There is variance of figures of brick kilns permissible during March to June within the carrying capacity. Nature of brick kiln activity being continuous, only such number can be allowed which can be sustained throughout the said period i.e. the minimum figure of a particular month out of the four months, which comes to 444 in Haryana (in the month of May) and 200 in UP (in the month of June). Thus, only this number can be allowed for the time being during the period air quality is not severe. Shortlisting for the purpose may be done applying a suitable siting criteria taking into account inter-se distance, distance from sensitive locations and compliance of consent conditions. Further, location of brick kilns be scattered on pro-rata basis, in different directions of the area, having regard to background and carrying capacity parameters. On that broad basis, selection criteria be worked out by a joint Committee of CPCB and State PCBs. Those brick kilns which switch over to PNG will be entitled to operate even beyond months of March to June and even beyond the number of brick kilns on Zig-Zag technology within the carrying capacity. This can be revisited if air quality improves or if carrying capacity increased as a result of measures adopted by the State authorities in future, by reducing pollution load from different sources.

18. The Tunnel kiln technology with PNG can be followed, if viable, on which it may be permissible for the brick kilns to function even in severe conditions for existing or new brick kilns. The direction dated 27.11.2020 by CPCB also shows the need for reducing pollution load and not to allow activities by using coal.

19. As mentioned earlier, the recommendation that the brick kilns can be allowed with effective monitoring appears to be hypothetical in view of monitoring having been found to be hardly effective, on performance audit

of PCBs, as will be shown in later part of this para. While in absence of carrying capacity, brick kilns are not permissible in 'severe' air quality situation, need for improving monitoring and minimising pollution is undisputed. In this regard, matter has been considered by this Tribunal in OA 95/2018, *Aryavart Foundation v. M/s Vapi Green Enviro Ltd. & Ors.*[30], and in the light of report of performance audit of State PCBs, it has been found that performance is inadequate in terms of staff, equipment and functioning. Similar situation has been found in OA 837/2018, *Sandeep Mittal Ministry of Environment, Forests & Climate Change & Ors.*[31], in relation to monitoring of EC conditions by the MoEF&CC. We have recently come across several cases of industrial accidents[32] and one of the

[30] vide order dated 05.02.2021

[31] Vide order dated 01.02.2021

[32]

i. Order dated 01.06.2020, relating to incident of gas leak dated 07.05.2020 in **LG Polymers India Pvt. Limited** at Vishakhapatnam, resulting in death of 11 persons and injuries to more than 100, apart from other damage (OA No. 73/2020, In re: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village Visakhapatnam in Andhra Pradesh);

ii. Order dated 03.02.2021, relating to incident dated 03.06.2020 in a chemical factory, **Yashyashvi Rasayan Pvt. Ltd**. at Dahej, District Bharuch, Gujarat resulting in deaths and injuries and other damage (OA No. 85/2020) (Earlier OA 22/2020) (WZ), Aryavart Foundation through its President vs. Yashyashvi Rasayan Pvt. Ltd. & Anr.);

iii. Order dated 06.08.2020, in relation to incident of **oil well blow out on 27.05.2020 at Baghjan in the Tinsukia District of Assam** resulting in deaths, injuries and damage to the environment (OA No. 43/2020(EZ), Bonani Kakkar vs. Oil India Limited & Ors.).

iv. Orders dated 06.07.2020 and 22.12.2020, relating to incident dated 30.06.2020 on account of gas leakage at **Sainor Life Sciences** factory at Parawada in industrial area on the outskirts of Vishakhapatnam (OA No. 106/2020, News item published in the local daily "Economic Times" dated 30.06.2020 titled "Another Gas Leakage at Vizag Factory kills two, critically injures four…");

v. Orders dated 08.07.2020 and 22.12.2020, dealing with the incident dated 01.07.2020 resulting in death of 6 person and injury to 17 due to blast of boiler in **M/s Neyveli Thermal Power Station** (NLCIL), Cuddalore (OA No. 108/2020, News item published in the "Indian Express" dated 01.07.2020 titled "Tamil Nadu Neyveli boiler blast: 6 dead, 17 injured") and;

vi. Orders dated 23.07.2020 and 22.12.2020, in relation to incident of **fire engulfed the chemical plant** of **Visakha Solvents Ltd**, Vizag on 13.07.2020 at Ramky CETP Solvents building in Pharma City resulting in injuries (OA No. 134/2020, News item published on 13.07.2020 in the local daily named "India Today" titled "Massive fire engulf Vizag chemical plant, explosions heard, injuries reported").

vii. Order **dated 18.12.2020**, in relation to incident of **explosion in a plastic recycling factory at Sujapur in Malda on 1.12.2020** resulting in death of six persons, including two minors and serious injuries to four persons (OA No. 272/2020, News item published in the "Times of India" dated 20.11.2020 entitled "Six killed as blast tears through Malda Plastic recycling factory").

viii. Order dated **18.12.2020**, in relation to incident of **methane gas leak in a sugar factory** called Lokenete Bapurao Patil Agro Industries Ltd. in Mohol Taluka of Solapur District, Maharashtra on 21.11.2020 resulting in deaths and injuries and other damage (OA No. 274/2020, News item published in the "Indian Express" dated 23.11.2020 entitled "Maharashtra: Two Killed, eight injured in methane gas leak in sugar factory").

reasons for the same is inadequate monitoring. In OA 85/2020, *Aryavart Foundation through its President v. Yashyashvi Rasayan Pvt. Ltd. & Anr.*[33], directions have been issued to improve the same. We have already noted in other proceedings[34] that as per official statistics, 100 industrial clusters are polluted, 351 river stretches are polluted and 122 cities are non-attainment in terms of air quality, apart from huge gaps in waste generation and management. Inspite of monitoring of the said issues by this Tribunal, the situation is far from any improvement. Thus, it is undeniable that stringent steps for monitoring to achieve goal of sustainable development are required. While monitoring must certainly improve, such suggestion is not enough to presume that pollution load by coal-fired brick kilns will reach zero so as to sustain coal-fired brick kilns in NCR in severe air quality conditions. In such situation, potential damage to public health cannot be ignored, while dealing with the issue of

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ix. Order dated 08.01.2021, in relation **to Gas Leak in Agro Company** (O.A No. 107/2020, In RE: News item published in the local daily "Indian Express Sunday Express" dated 28.06.2020 titled "Gas Leak in Agro Company Claims life of one")

x. Order dated 18.01.2021, in relation to News item published in Navbharat Times dated 24.12.2020 titled "**Gas leaks in IFFCO Plant**, 2 Officers dead" (O.A No. 04/2020, In re : News item published in Navbharat Times dated 24.12.2020 titled "Gas leaks in IFFCO Plant, 2 Officers dead")

xi. Order dated **11.02.2021**, in relation to accident of **toxic gas leak in Rourkela Steel Plant in Orissa**" (O.A. No. 09/2021, In re: News item published in The Indian Express dated 07.01.2021 titled "Four workers dead due to toxic gas leak in Rourkela Steel Plant")

[33] Vide order dated 03.02.2021

[34] (i) Vide order dated 21.09.2020, OA 673/2018, *In Re: News item published in "The Hindu" authored by Shri Jacob Koshy, titled "More river stretches are now critically polluted: CPCB*"

(ii) Vide order dated 21.08.2020, OA 681/2018, News item published in "The Times of India" Authored by Shri Vishwa Mohan titled "NCAP with multiple timelines to clean air in 102 cities to be released around August 15"

(iii) Vide order dated 14.11.2019 in OA 1038/2018, News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels"

(iv) Vide order dated 28.02.2020 in OA No. 606/2018, Compliance of Municipal Solid Waste Management Rules, 2016.

(v) Vide order dated 18.01.2021 in OA 710/2017, *Shailesh Singh, v. Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.* with regard to **bio-medical waste**

(vi) Vide order dated 29.01.2021 in OA 804/2017, *Rajiv Narayan v. Union of India & Ors.* with regard to **hazardous waste.**

(vii) Vide order dated 15.01.2021in OA 512/2017, *Shailesh Singh v. State of UP* with regard to **e-waste.**

(viii) Vide order dated 08.01.2021 in EA 13/2019 in OA 247/2017, *Central Pollution Control Board v. State of Andaman & Nicobar & Ors.* with regard to **plastic waste.**

activity having potential for pollution, in the area having no carrying capacity to sustain further pollution load.

20. Thus, we conclude that going by the order dated 15.10.2020, in 'severe' air quality conditions, coal-fired brick kilns cannot be allowed to operate in NCR even if zig zag technology is used and improved procedures are followed, as suggested by the Committee, unless there is switch over to the PNG. All other issues have already been dealt with in the earlier order. In para 7 of order dated 05.03.2020 and para 8 of order dated 23.03.2020, we have already held that compliance by an individual brick kiln, otherwise contributing to pollution load beyond carrying capacity, does not confer a right to continue such activity, when such activity attracts GRAP in 'severe' air quality condition. As noted in par 11 of the order dated 15.10.2020, the CPCB has found that there is no assimilative capacity during the period air quality is 'severe' and only during months of March to June there is a limited capacity. Inter-se distance of atleast 500 meters is required to be maintained in location of brick kilns. When brick kilns start, they should not be allowed to start simultaneously but their firing should be staggered to avoid adverse impact on the environment. Other safeguards of fugitive dust emission management need to be adopted. In para 18 of order dated 15.10.2020, the issue of non-availability of plea of discrimination to GRAP, attracting some polluting categories and not attracting other polluting activities, has already been dealt with. Accordingly, we reiterate this mandate.

21. In view of the above discussion, unless there is change to cleaner fuel (PNG), brick kilns beyond the number mentioned in Table 15 above cannot be allowed, in the NCR. Since there is variance of figures given during March to June, only such number can be allowed which can be

sustained throughout the period i.e. the minimum figure of a particular month out of the four months which comes to 444 in Haryana (in the month of May) and 200 in UP (in the month of June). Such shortlisting may be done applying a suitable siting criteria taking into account inter-se distance and distance from sensitive locations and compliance of consent conditions for which the CPCB, State PCB may work out an appropriate mechanism. Further, location of brick kilns be scattered on pro-rata basis, in different directions of concerned area, having regard to background and carrying capacity parameters. Needless to say, those brick kilns which switch over to PNG will be entitled to operate even beyond months of March to June and even beyond limited number mentioned, subject to compliance with law.

The application will stand disposed of in above terms.

A copy of this order be forwarded to CPCB, UP, Haryana and Rajasthan State PCBs for compliance.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

February 17, 2021
Original Application No. 1016/2019
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