A SYSTEM DYNAMICS APPROACH TO THE ANALYSIS OF INDIAN CEMENT INDUSTRY

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ABSTRACT

The production of the cement plays the most important role in all the construction activities in the country. Due to rapid growth in the industrialisation and the development there is fast growing internal demand of cement However, cement industry in India has not been able to cope up with the demand. Therefore, it is essential to study the demand and production aspects in order to evolve strategies to meet the demand. For this purpose a System Dynamics model for cement production is developed. The production model is run for 16 years covering a period from 1974 to 1990 at three conditions, such as basic, optimistic and pessimistic. The different sensitivity runs are also carried out by changing the different parameters influencing the production. Different scenarios are generated and the gap between demand and production is analysed at different conditions. It is observed that this gap is closed under certain conditions.

1. INTRODUCTION

Cement Industry is one of the major manufacturing industries in India. It supplies the primary input to all the spheres of the construction activities, both the industrial and the residential in the country. This, we call it a nation building industry. It covers 1.2% of the total industrial production in India.

The growth of the cement Industry in India has not been able to cope up with the demand. Due to rapid industrialisation and development in the country the demand is growing very fast. The growth of the cement Industry in India has followed an uneven pattern over the past plan periods. Whenever shortage has occured, the industry has not been able to increase the production rapidly.

To meet the demand projections efforts can to be made to create adequate capacity required by installation of new plants, expansion in the existing plants and to facilitate improvements in the existing technology of the plant. But there are a lot of other factors which have profound influence on the production of cement whose proper selection and improvement may increase the production of cement. These factors are such as, Govt. policy toward expansion and setting up new plants, Government pricing policy, power and wagon supply priorities, mechanical trouble and labour strikes, coal and raw materials supply conditions, packing bags, substitute material growth, etc. All these parameters exhibit complex time varying interactions with each other and production variables.

The use of the principles and methodology of System Dynamics [1,2,3,4] is made to analyse the gap between the demand and production of cement in India from point of view of long range planning. The relevant data were collected from various sources [5,6,7].

The model is run from 1974 to 1990 for a period of sixteen years and validated by using the data available from controller of cement (India). The sensitivity runs are also carried out by changing the different parameters influencing the production of the cement. The gap between demand and production is analysed at different conditions. It is observed that the net production of the cement can be increased to satisfy the demand.

2. THE MODEL

All the interacting parameters which directly or indirectly affect the production are identified and studied. In the production model three inflow rates and one outflow rate influenced by a lot of interacting parameters are considered.

The inflow rates are:

i) The installation of additional capacities by way of new plants.

ii) The expansion in the capacities of the existing plants.

iii) The improvements in the technology of the existing plants by

a) the conversion of wet grinding process to dry grinding process

b) using precalciners

c) waste mixing process

The out flow rate is the depreciation of the plants. The other parameters influencing the production are:

i) The Govt. ploicy toward expansion and setting up new plants.

ii) The Govt. pricing policy

iii) The types of bags used for packing the cement (the conventional packing bags used in India are jute bags. Generally 1 to 2 kg. of cement per bag is pilfered while being transported).

iv) The stonning due to rain (since cement is packed in jute bags, there are chances of setting up of cement and formation of stonnes while being stored or transported).

v) The substitute material growth

vi) The labour strikes (the frequency of labour strikes can be reduced by sound personnel policies.).

vii) The shortage of coal

viii) The shortage of rail wagons

ix) The pwer shortage

By considering all the parameters which directly or indirectly affect the production, the productionm model is developed. The system equations written in DYNAMO language are not included in the paper. The details are available in [8].

2.1 Flow Diagram

The flow diagram depicting all the interacting variables and parameters influencing the production is shown in Fig. 1.

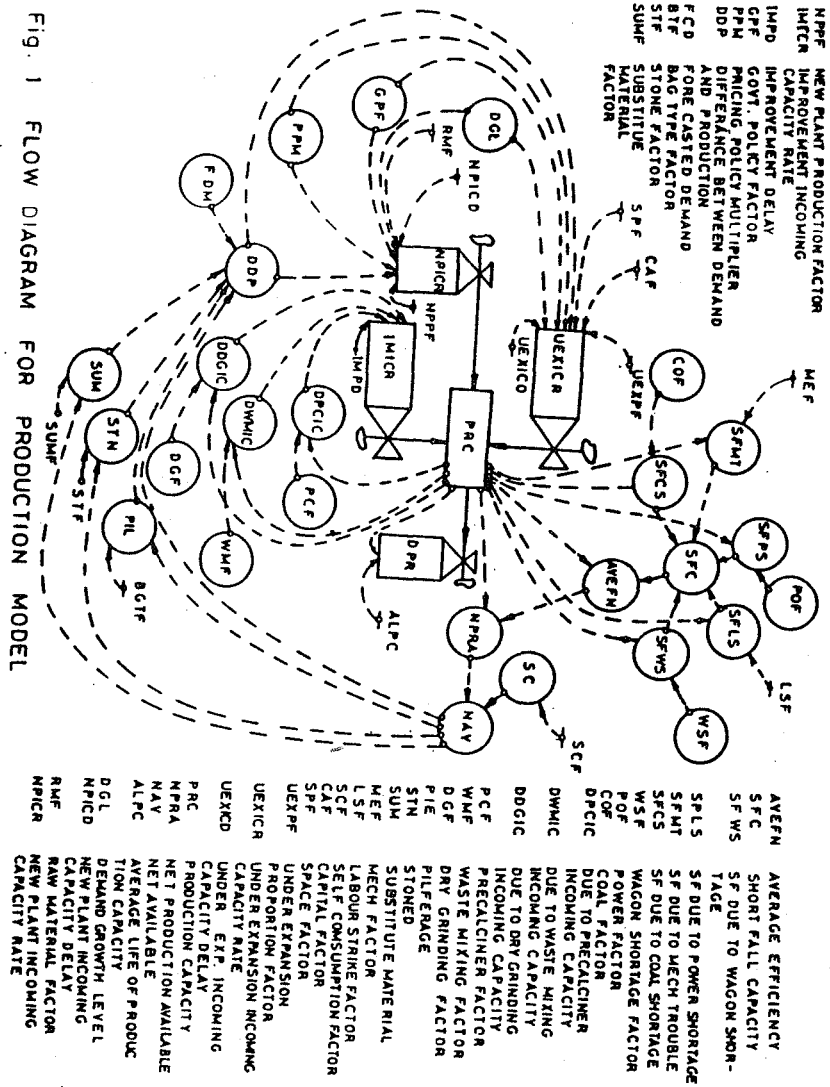

Fig. 1 FLOW DIAGRAM FOR PRODUCTION MODEL

Production capacity is affected by the following capacity rates:

i) New Plant incomming capacity rate.

ii) Under expansion incoming capacity rate

iii) Improvement incoming capacity rate.

Incoming capacity rate under new plants is primarily affected by the information available about the difference between demand and production and the demand growth level, while both of them are affected by the forecasted demand. Incomming capacity under new plant is again influenced by pricing policy, Govt. policy regarding percentage installation against the difference between demand and production, and raw material availability. New plant proportion factor which decides what percentage of total percentage of total gap will be under new plants influences incoming capacity under new plants.

Incoming capacity rate under expansion is influenced by the information available about the difference between demand and production and the demand growth level as the information used in the new plant incoming capacity. Besides these factors it is also influenced by the space factor which shows the percentage of land availability for construction and the capital factor which shows the percentage capital investment for expansion programme. Under expansion proportion factor which decides the percentage of the total gap to be installed under expansion programme is also included in the model.

Incoming capacity under inprovement is affected by the following technological improvements in the existing capacities:

i) Due to pre-calciners

ii) Due to dry grinding

iii) Due to waste mixing.

The above three processes are affected by the factors like precalciner factor, dry grinding factor and waste mixing factor respectively.

Difference between demand and production is influenced by net availability and the fore-casted demand. It is also affected by the wastage, i.e., pilferages, stonned due to rain and substitute material growth.

Net production available is affected by the production capacity as well as the average efficiency. Average efficiency is again influenced by the short fall capacities which itself is influenced by short fall due to wagon shortage, coal shortage, power shortage, mechanical trouble and labour strike.

Some quantity of the cement is consumed by the factory itself for its own construction and repairs. Therefore, the net availability is affected by the self consumption of the plants also.

In the production model there are five positive loops and two negative loops.

3. RESULTS AND ANALYSIS

The production model was run for 16 years covering a

period from 1974 to 1990. For our convenience to discuss the results we have devided total runs in two sets which include the following runs:

Set - I i) Basic Run

ii) Optimistic Run

iii) Pessimistic Run

Set - II Sensitivity Runs, by changing the following parameters.

i) Bag type factor

ii) Mechanical trouble factor

iiii) Labour strike and unrest factor

iv) Power shortage factor

v) Government Policy factor

vi) Pricing policy multiplier

The above runs were carried out seperately by chaning the values of different parameters according to our required conditions and different scenarios were generated.

3.1 Runs Under Set - I

Three runs were carried out which generated the different scenarios such as, Basic, Optimistic and Pessimistic scenario. For the basic run the standard values as given in the system equations,were taken where as for the optimistic and pessimistic runs the values for the different parameters were suitably changed from maximum to minimum realizable limits respectively.

3.1.1 Basic Run

The basic run was carried out by considering all the

standard values considered in the basic model system equations. 418 The results are shown in Table 3.1.1.

Table: 3.1.1. Results of Basic Run of Production Model (in Million Tonnes)

Year	NAV	NPRA	PRC	IMICR	UEXICR	NPICR
1974	17.8789	17.9775	19.8800	0.8389	0.0228	0.0364
1976	16.8209	16.9220	20.3806	0.9008	0.0582	0.0930
1976	18.4607	18.5659	21.0249	0.9714	0.0602	0.0972
1977	19.1440	19.2518	21.8338	1.0476	0.0762	0.1218
1978	19.7274	19.8393	22.5446	1.1317	0.0969	0.1549
1979	19.6888	18.8053	23.4772	1.2255	0.7848	1.2545
1980	19.9655	20.0958	26.1725	1.4240	0.8645	1.3818
1981	23.0673	23.2132	29.4173	1.6533	0.8120	1.2979
1982	25.6448	25.8064	32.5921	1.8969	0.9238	1.4766
1983	28.5747	28.7545	36.2375	2.1815	0.9217	1.4732
1984	31.6801	31.8789	40.0892	2.4935	1.0044	1.6055
1985	35.1282	35.3484	44.3908	2.8499	1.0405	1.6632
1986	38.9038	39.1471	49.0565	3.2476	0.9935	1.5880
1987	42.8023	43.0696	53.9044	3.6763	0.9400	1.5025
1088	46.8755	47.1679	58.9451	4.1379	0.9529	1.5232
1989	51.2042	51.5235	64.3803	4.6483	1.0592	1.6930
1990	56.0801	56.4297	70.4931	5.2306	0.9951	1.5905

where

NAV = Net availability of cement

NPRA = Net production available of cement

PRC = Total production capacity

IMICR = Under improvement incoming capacity

UEXICR = Under expansion incoming capacity

NPICR = Under new plant incoming capacity.

3.1.2 Validation of the model:

The production model is avalidated by comparing the results obtained from the basic model run to the actual data

obtained from [5,6,7]. The model results for the net production available are fairly close to the actual net production available for the Indian Cement Industry from 1974 to 1980, as shown in Table 3.1.2.

Fairly close rememblence of the model output to the actual data indicates that the model developed can be considred to represent the production of the Indian Cement Industry and fit for further experimentation and scenario generation.

Table 3.1.2 Validation of the Production Model

Year	Net production available, Results obtained by the production Model in Million Tonnes. *1 (a)	Actual net production available In Million Tonnes. *2 (b)	Difference of (a - b)
1974	17.9775	14.3400	+ 3.6375
1975	16.9220	16.3520	+ 0.5700
1976	18.5650	18.7070	- 0.1420
1977	19.2518	19.1730	+ 0.0450
1978	19.8393	19.6220	+ 0.2173
1979	18.8053	18.3380	+ 0.4673
1980	20.0958	17.8940	+ 2.2018

*1 = Refer Table 3.1.1.: Results of Basic Run for the Production mode.

*2 = Data available from [6].

3.1.3. Optimistic Run

For the optimistic run the maximum realisable values of some of the parameters were suitably assumed. The results of the optimistic run are shown in Table 3.1.3.

3.1.4 Pessimistic Run

For the pessimistic run the minimum limits of values of the parameters were suitably assumed. The results of the pessimistic runs are shown in Table 3.1.4.

3.2. Runs Under Set - II

In the set II, sensitivity analysis is carried out by changing the values of parameters affecting the production of cement within the physically realisable limits.

(i) For Bag Type Factor (BGTF)

Pilferage is assigned as Bag Type Factor in model. As the wastage of the cement due to the pilferages, i.e., Bag Type Factor is being decreased, such as 1 kg per bag containing 50 kg. in the basic run and ¾, ½ and 0 kg. respectively in sensitivity runs, it is observed that the net production available of the cement increases as seen in Table 3.2.(i).

(ii) Mechanical Trouble Factor (M.F):

Mechanical trouble is a parameter which affects directly the production capacity, i.e., efficiency. Thus as value of MEF increases the value of net production available of the cement increases as seen in Table 3.2 (ii).

(iii) Labour strike Factor (LSF)

Labour strike is a parameter which directly affects the efficiency. Thus as the LSF increases the net production available decreases as given in Table 3.2(iii).

Table 3.1.3: Results of Optimistic Run for Production Model in Million Tonnes.

Year	NAV	NPRA	PRC	IMICR	UEXICR	NPICR
1974	17.6344	17.7330	19.8800	0.8389	0.0236	0.0378
1975	18.0803	18.1814	20.3827	0.9009	0.0370	0.0592
1976	18.6032	18.7072	20.9722	0.9689	0.0569	0.0893
1977	19.2193	19.3268	21.6668	1.0443	0.0721	0.1153
1978	19.9275	20.0389	22.4652	1.1278	0.0909	0.1453
1979	20.7388	20.8548	23.3798	1.2204	0.6030	0.9639
1980	22.7965	22.9240	25.6996	1.3929	0.6184	0.9885
1981	25.0016	25.1414	28.1854	1.5840	0.6358	1.0163
1982	27.3722	27.5253	30.8579	1.7959	0.7416	1.1854
1983	30.1272	30.2956	33.9637	2.0446	0.7526	1.2031
1984	33.0731	33.2580	37.2848	2.3191	0.8459	1.3538
1985	36.4209	36.6245	41.0589	2.6360	0.8889	1.4208
1986	40.0794	40.3035	45.1833	2.9911	0.8489	1.3569
1987	83.8877	44.1331	49.4766	3.3743	0.7999	1.2786
1988	47.8468	48.1143	53.9398	3.7866	0.8193	1.3096
1989	52.1371	52.4287	58.7765	4.2437	0.9249	1.4784
1990	56.9905	57.3092	64.2479	4.7672	0.8582	1.3717

Table 3.1.4 Results of Pessimistic Run for Production Model in Million Tonnes.

Year	NAV	NPRA	PRC	IMICR	UEXICR	NPICR
1974	13.6186	13.7172	19.8800	0.8389	0.0869	0.1388
1975	14.0755	14.1776	20.5470	0.9082	0.1002	0.1602
1975	14.5946	14.7003	21.3047	0.9843	0.1193	0.1907
1977	15.1893	15.2993	22.1728	0.1360	0.1360	0.2174
1978	15.8598	15.9746	23.1516	1.1622	0.1556	0.2487
1979	16.6156	16.7359	24.2550	1.2661	0.9645	1.5417
1980	18.8675	19.0041	27.5422	1.4928	0.9680	1.5473
1981	21.2358	21.3896	30.9994	1.7422	0.9762	1.5603
1982	23.7432	23.9141	34.6581	2.0171	1.1176	1.7864
1983	26.6386	26.8314	38.8861	2.3409	1.1212	1.7922
1984	29.7053	29.9203	43.3628	2.6972	1.2103	1.9346
1985	33.1132	33.3530	48.3377	3.1033	1.2532	2.0032
1986	38.8076	37.0741	53.7306	3.5570	1.2170	1.9453
1987	40.6744	40.9689	59.3752	4.0494	1.1699	1.8701
1988	44.7174	45.0412	65.2771	4.5825	1.1894	1.9011
1989	49.0794	49.4347	71.6445	5.1727	1.2967	2.0727
1990	53.9495	54.3401	78.7537	5.8435	1.2376	1.9783

Table 3.2(i) Net Production Available in Million Tonnes
Effect of Bag Type Factor (BGTP)

Year	BGTP = 0	BGTP=0.005	BGTP=0.01	BGTP=0.015
1974	17.9775	17.9775	17.9775	17.9775
1975	16.9105	16.9134	16.9163	16.9191
1976	18.5414	18.5473	18.5532	18.5591
1977	19.2156	19.2246	19.2337	19.2427
1978	19.7905	19.8027	19.8149	19.8277
1979	18.7488	18.7529	18.7770	18.7911
1980	19.9884	20.0152	20.0429	20.0689
1981	23.0494	23.0902	23.1311	23.1725
1982	25.5857	25.6407	25.6958	25.7510
1983	28.4688	28.5399	28.6112	28.6827
1984	31.5261	31.6138	31.7018	31.7902
1985	34.9259	35.0309	35.1363	35.2425
1986	38.6505	38.7739	38.8977	39.0221
1987	42.4947	42.6373	42.7807	42.9248
1988	46.5093	46.6726	46.8368	47.0019
1989	50.7771	50.9621	51.1481	51.3553
19 0	55.5895	55.7976	56.0070	56.2177

Table 3.2 (ii) Net Production Available in Million Tonnes
(Effect of Mechanical Trouble Factor (MEF)).

Year	MEF=0.01	MEF=0.02	MEF=0.03	MEF=0.04
1974	18.7727	18.5739	18.3751	18.1763
1975	17.7110	17.5140	17.3168	17.1196
1976	19.3500	19.1542	18.9581	18.7617
1977	20.0360	19.8406	19.6448	19.4485
1978	20.6268	20.4308	20.2347	20.0370
1979	19.6117	19.4112	19.2099	19.0080
1980	29.8805	20.6865	20.4911	20.2942
1981	23.9707	23.7844	23.5961	23.4057
1982	26.5428	26.3626	26.1798	25.9944
1983	29.4692	29.2951	29.1180	28.9378
1984	32.5758	32.4067	32.2342	32.0583
1985	36.0401	35.8728	35.7018	35.5270
1986	39.8381	39.8728	39.5006	39.3259
1987	43.7568	43.5913	43.4217	43.2478
1988	47.8466	47.6835	47.5161	47.3443
1989	52.1994	52.0373	51.0873	51.6995
1990	57.1161	56.9508	56.7819	56.6083

Table 3.2 (iii) Net Production Available in Million Tonnes
(Effect to Labour Strike Factor (LSF)).

Year	LSF=0	LSF=.005	LSF=.005	LSF=.01
1974	18.2160	18.2061	18.1166	18.0172
1975	17.1590	17.1491	17.0603	16.9615
1976	18.8010	10.7912	18.7027	18.6044
1977	19.4878	19.4780	19.3895	19.2912
1978	20.0865	20.0666	19.9778	19.8789
1979	19.0484	20.3238	18.9472	18.8459
1980	20.3337	20.3238	20.2348	20.1356
1981	23.4440	23.4344	23.3482	23.2518
1982	26.0317	26.0224	25.9393	25.8442
1983	28.9741	28.9650	28.8831	28.7914
1984	32.0938	32.0849	32.0049	31.9151
1985	35.5623	35.5535	35.4738	35.3844
1986	39.3616	39.3524	39.2727	39.1832
1987	43.2829	43.2742	43.1948	43.1056
1988	47.3990	47.3703	47.2918	47.2035
1989	51.7341	51.7254	51.6472	51.5591
1990	56.6434	56.6346	56.5552	56.4658

Table 3.2 (iv) Net Production Available in Million Tonnes
(Effect of Power shortage Factor(PSF)).

Year	PSF=0.01	PSF=0.03	PSF=0.05	PSF=0.08
1974	17.9775	19.5799	17.1823	16.5859
1975	18.4709	18.0766	17.6818	17.0883
1976	18.8278	18.4351	18.0412	17.4481
1977	19.1897	18.7962	18.4000	17.8047
1978	20.0927	19.6073	19.2095	18.5083
1979	20.6147	20.2147	19.8118	19.2018
1980	22.8441	22.4704	22.0907	21.5102
1981	25.2260	24.8744	24.5147	23.9596
1982	27.7258	27.3924	27.0490	26.5149
1983	30.5809	30.2549	29.9376	29.4243
1984	33.3273	33.3273	33.0128	32.5166
1985	37.0602	36.7647	36.4559	35.9663
1986	40.8359	40.5439	40.2379	39.7511
1987	44.7311	44.4437	44.1416	43.6594
1988	48.7934	48.5123	48.2162	47.7418
1989	53.1296	52.8517	52.5583	52.0873
1990	58.0490	57.7678	57.4709	56.9937

Table 3.2 (v): Net Production Available in Million Tonnes (Effect of Government Policy Factor (GPF)).

Year	GPF=0.05	GPF=0.15	GPF=0.25	GPF=0.35
1974	17.9775	17.9775	17.9775	17.9775
1975	16.9343	17.0573	17.1802	17.3032
1976	18.6112	19.0625	19.4933	19.9036
1977	19.3324	20.0866	20.7489	21.3243
1978	19.9619	21.0676	21.9734	22.7062
1979	18.9660	20.3728	21.4634	22.3008
1980	19.0780	21.0650	22.5805	23.7439
1981	20.8394	23.6856	25.8008	27.3937
1982	22.1824	25.8220	28.3851	30.2087
1983	23.7229	28.2923	31.3176	33.3388
1984	25.4387	30.9853	34.4332	36.5995
1985	27.3672	34.0206	37.9413	40.3008
1986	29.5682	37.4034	41.7971	44.3360
1987	31.9145	44.7696	45.7444	48.3613
1988	34.5117	48.8446	49.8410	52.4620
1989	37.3342	48.8446	54.2034	56.8425
1990	40.5054	53.4343	59.174	61.9437

Table 3.2 (vi): Net Production in Million Tonnes (Effect of Pricing Policy Multiplier (PPM)).

Year	PPM= 1.1	PPM = 1.24	PPM = 1.31
1974	17.9775	17.9775	17.9775
1975	16.9269	16.9338	16.9372
1976	18.5835	18.6094	18.6223
1977	19.2842	19.3292	19.3517
1978	19.8886	19.9570	19.9910
1979	18.8700	18.9597	19.0040
1980	20.1494	20.4190	20.5521
1981	23.2616	23.7242	23.9498
1982	25.8489	26.4561	26.7477
1983	28.5766	29.3103	29.6574
1984	31.5077	32.3553	32.7509
1985	34.7875	35.7 72	36.2049
1986	38.4091	39.4989	39.9969
1987	42.1856	43.3726	43.9091
1988	46.1654	47.4234	47.9941
1989	50.4127	51.7495	52.3404
1990	55.=957	56.6254	57.2528

(iv) Power Shortage Factor (PSF)

Power is the vital factor affecting the production capacity in the Indian Conditions. As seen in Table 3.2.(iv) a great decline in the net production available is there as the power shortage factor increases.

(v) Government Policy Factor

Government policy is decided by the Government that what percentage of the total difference of demand and production must be installed as the new plants or under expansion in the existing plants in the subsquent years. With more installations the net production available increases as shown Table 3.2. (v).

(vi) Pricing Policy Multiplier (PPM)

Pricing Policy Multiplier is such factor which initiates the people toward the installation of the new plants or exapnsion in the existing plants. As this multiplier is increased the net production available increases as shown in Table 3.2(vi).

4. CONCLUSIONS

India is not self sufficient in the production of cement to meet the demand. Thus a detailed and critical study has been carried out for both the demand and production by analysing the behaviour of the gap between demand and production.

The data for the forecasted demand for cement were available from the office of Cement Controlleer, New Delhi, Govt. of India as shown in Table(4).

Table 4.0: Forecasted Demand in Million Tonnes

Year:	1974	1975	1976	1977	1978	1979	1980	1981	1982
	19.90	19.12	20.62	22.22	24.0	25.92	27.99	30.22	32.64
	1983	1984	1985	1986	1987	1988	1989	1990	
	35.27	38.59	42.05	45.41	48.20	52.16	56.83	61.20	

Thus, a study to analyse the gap between demand and production was carried out by considering the forecasted demand and the net production available at the different conditions such as Basic, optimistic, pessimistic and sensitivity runs of production model.

4.1 Gap between Demand and Basic, Optimistic and Pessimistic Net Production Available:

Fig.2 shows the plot for the demand and the net production available under basic, optimistic and pessimistic conditions. It is observed that in the beginingof 1974 & 1975 the gap between demand and production is minimum but after that it maintains a sufficient gap.

4.2 Gap between Demand and the Net Production Available under different conditions of the sensitivity runs.

It is observed from the studies conducted for the different sensitivities runs as seen in Table 3.2 (i) (ii) (iii) (iv) (v)& (vi) that all the parameters such as (i) Beg Type Factor (ii) Mechanical Trouble Factor (iii) Labour Strike Factor (iv) Power Shortage Factor (v) Government Policy and (vi) Pricing Policy Multiplier are responsible to improve the net production available of the cement

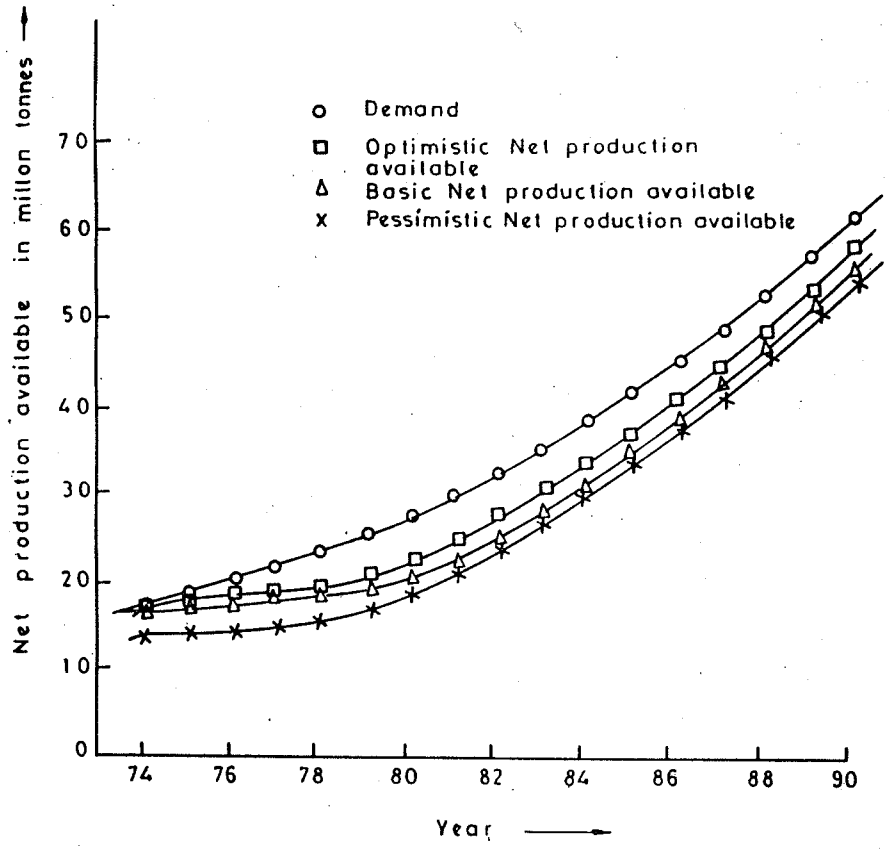

Fig. 2 GAP BETWEEN DEMAND AND NET PRODUCTION AVAILABLE

because they directly affect the net production available.

A critical examination of the results indicates that the following parameters have the profound influence on the production available:

i) Power Shortage Factor

ii) Government Policy Factor

iii) Pricing Policy Multiplier.

4.2.1. Gap between Demand and Net Production Available at Different Power Shortage Factors.

The sensitivity runs were carried out considering PSF equal to 0.01, 0.03, 0.05 and 0.08. The gap between demand and production exists as revealed by Table 3.2 (iv) and Table 4.

4.2.2 Gap between Demand and Net Production Available at Different Government Policy Factor.

Government Policy Factor decides what percentage of total difference of demand and production must be installed in the subsequent years. The sensitivity runs for GPF equal to 0.05, 0.15, 0.25 and 0.35 were carried out. At the greatest GPF = 0.35 it is observed that after 1986 at this policy the gap between demand and net production available is closed and some surplus stock of cement is available. It can be seen in Fig. 3.

4.3.3 Gap between Demand and Net Production Available at Different Pricing Policy Multiplier.

At the three values of PPM equal to 1.1, 1.24, and 1.31 the net production available was compared with the demand. PPM is a factor which initiates the people towards the

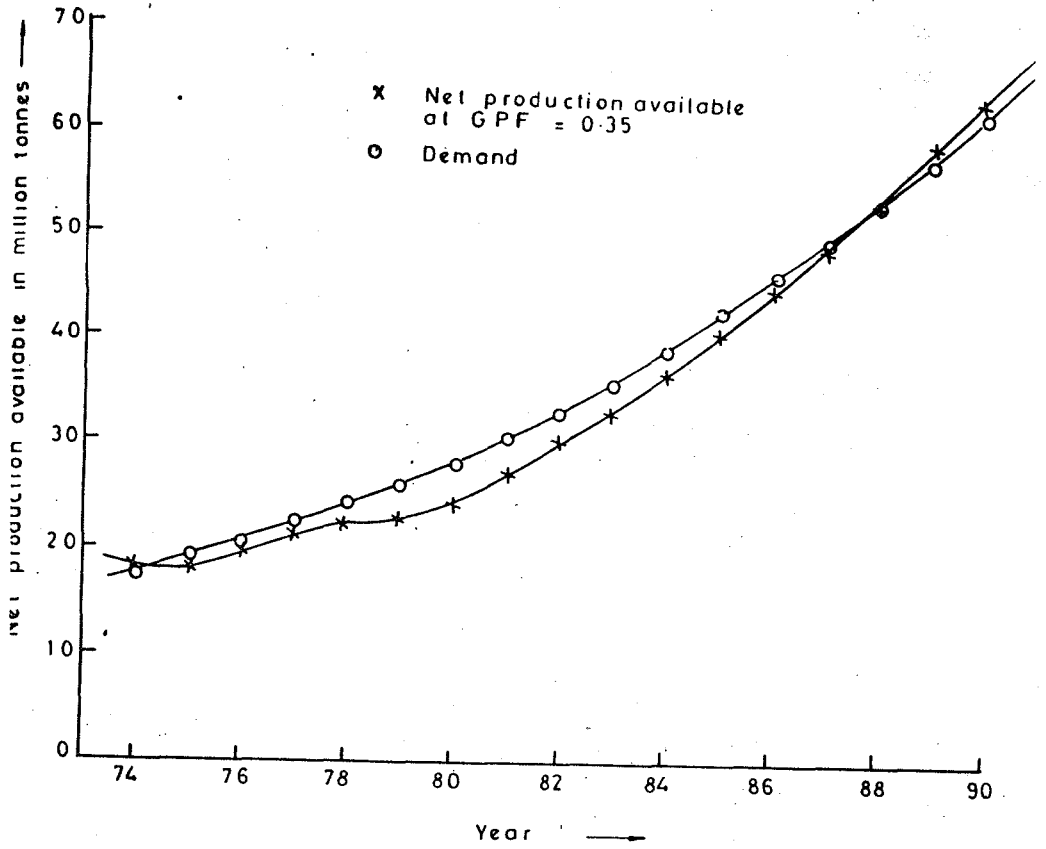

Fig.3 GAP BETWEEN DEMAND AND PRODUCTION AT G P F = 0.35

installation of new plants or expansion in the existing plants. It is observed from the results obtained that even at the greatest value of PPM = 1.31 the gap between demandand production available is not closed as shown in Table 3.2. (vi) and Table 4.

5. SUGGESTIONS

It is observed from the studies conducted that all the parameters affecting the production capacity may be improved to increase the net production available , i.e., to close the gap between demand and production.

In India Jute Bags are used for packing the cement which accounts for 1 to 3 kg. of pilferage as wastage. If Bag Type is improved to control the pilferage, net availability of the cement can be increased.

Mechanical trouble can be improved by proper selection of equipment and its maintenance polices where as labour strike can be minimised by the proper bonus and incentives to the workers and other personnel policies.

As we have studied that influence of wagon and coal shortage is very less but the power shortage has bhe vital, impact on the cement production. So it requires much more attention toward the improvement of the power shortage.

Government policy parameter decides that what percentage of total gap must be installed as new plant under expansion programme. This decision taken by the Government depends on the budget allocation to the cement industry. Therefore, if the Government wants to remove the shortage of the cement, this budget allocation must be increased.

Now-a-days Government has the dual pricing policy for Levy(controlled) cement and Non-Levy (free sale) cement. Free sale cement is sold at 50% higher rate than the controlled cement. This policy has initiated the private sector toward more installation of additional capacities. A proper pricing policy may help to increase the production capacity, i.e., to close the gap between demand and production.

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