

A study of Micro (Internal) and Macro (external) Environmental factor's Influence on Plant Level Production Management (PLPM) of selected Small Scale Industrial Units (SIUs) in PCMC

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Abstract –

This research focuses on influence of Micro (Internal) and Macro (external) Environmental factor's on Plant Level Production Management. Data collected from 248 small industrial units through structured questionnaire including 40 statements to evaluate the impact of micro and macro environmental factors. These 40 statements in the questionnaire covered all Microenvironment factors like Organizational environment, Supplier, Customers, Competitors, Intermediaries and Public and Macro environment factors like Demographic Environment, Political and Legal Environment, Social and Cultural Environment, Economic Environment, Technological Environment, Natural Environment. Results reveals that the proportion of SIU's influenced by Micro and Macro environmental factors, is greater than 50%.is accepted in both.

Introduction & Methodology

This research is unique in its type because first time here researcher tried to understand all actors and factors of Micro (Internal) Macro (External) environment which have influence on the performance of small industrial units engaged in manufacturing activity. This paper, although it is an offshoot of the thesis entitled “A study of Plant Level Production Management (PLPM) at Small Scale Industrial Units – With special reference to Pimpri-Chinchwad areas from Pune”

As we know there are various actors and factors which influence the performance of the organization some are controllable and some uncontrollable. So keeping this thing in mind, the study of Micro (Internal) and Macro (External) environmental factors which has the significant impact on the performance of SIU also needs to analyze.

Micro and Macro environment -

All Microenvironment factors like Organizational environment, Supplier, Customers, Competitors, Intermediaries and Public are studied with the help of structured questionnaire and results are drawn based on facts and figures get from respondents. In marketing management it is common phenomenon to study micro and macro environment factors and its influence but manufacturing units are thinking about it or not is big concern.

Macro environment factors like Demographic Environment, Political and Legal Environment, Social and Cultural Environment, Economic Environment, Technological Environment, Natural Environment systematically studied with the help of structured questionnaire and results are drawn based on facts and figures get from respondents

Literature review –

Deepmala Baghel, Parthasarthy, Meenakshi Gupta (2011) – In this exploratory research authors tried to explain scope for innovation in the cosmetic industry to achieve the growth. Research also focuses on problems faced by cosmetic MSMEs in attempting to be innovative. This research presents the study of the socio-economic and cultural background of small scale cosmetic entrepreneurs. How globalization and resultant socio-cultural and economic changes have created enormous opportunities for small scale industries. Manufacturers need to be innovative not only in the manufacture of products but also in presentation and marketing of the products. It is observed that majority of SSI involve setting up, running, maintaining, repairing and making minor changes to technology in response to local conditions but not go with modern technologies. Lack in creating the environment of learning. *(Beghel, Parthsarathi, & Gupta, 2011)*

Forest L. Reinhardt – Book titled ‘Down to earth- applying business principals to environmental management’ gives insights about environmental factors and its impact on the performance of an organization. It also covers how to control internal environment. This book covers approaches to reconciling shareholder value and environmental performance. The environment as a business problem, managing competitors, reduce cost, redefining markets, managing risk and uncertainty, integrating environment, etc. covered. *(Reinhardt, 2000)*

Objective of study –

To study Micro (Internal) and Macro (external) Environmental factors Influencing PLPM of sampled SIUs in Pimpri Chinchwad region

Sampling

There are more than 6000 different types of industrial units registered and functioning in Pimpri-Chinchwad area. With the enactment of the MSMED Act 2006 came into being w.e.f. 2nd October 2006, these organizations have been classified as Micro, Small and Medium and Large Enterprises with the wider

mandate of promotion and development of MSME Sector. As per MSMED Act 2006, the industrial units are required to be registered with DIC office for getting the loans and other facilities or concessions.

b) The study aims to observe the Plant Level Production Management (PLPM) and hence the foremost concern was made to examine only manufacturing SIUs. Such manufacturing SIUs were 713 registered with DIC office as on 31st March 2010 with an investment in plant and machinery in greater than Rs.25 Lakhs and less than Rs. 5 cores . The above population finite population of 713 manufacturing SIUs is held as a base to determine the sample size of 248 SIUs as per the krejcie and morgan formula for 95% level of confidence.

Analysis and Hypothesis testing –

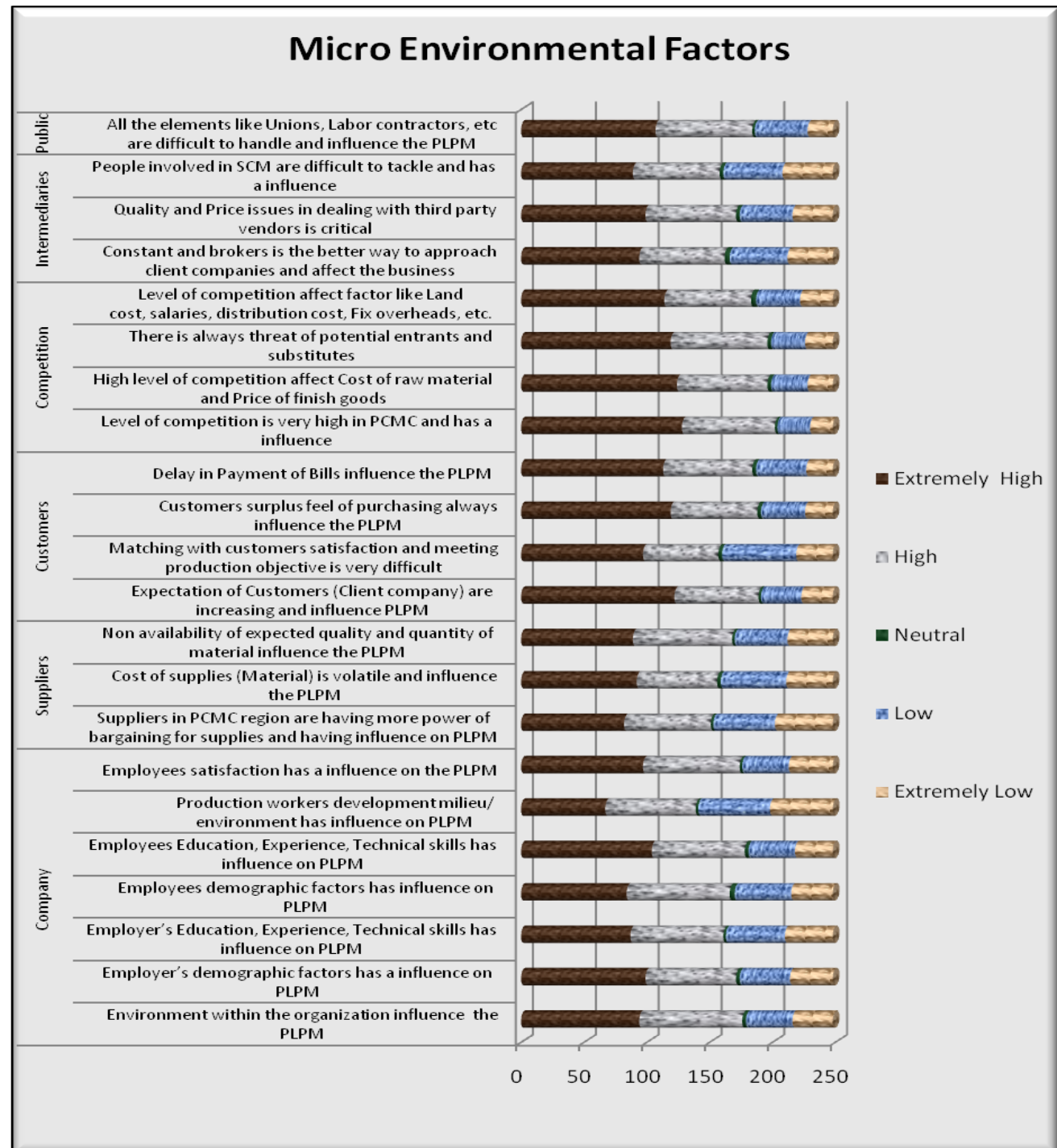


Fig – Frequency distribution of respondents for Micro environmental factors

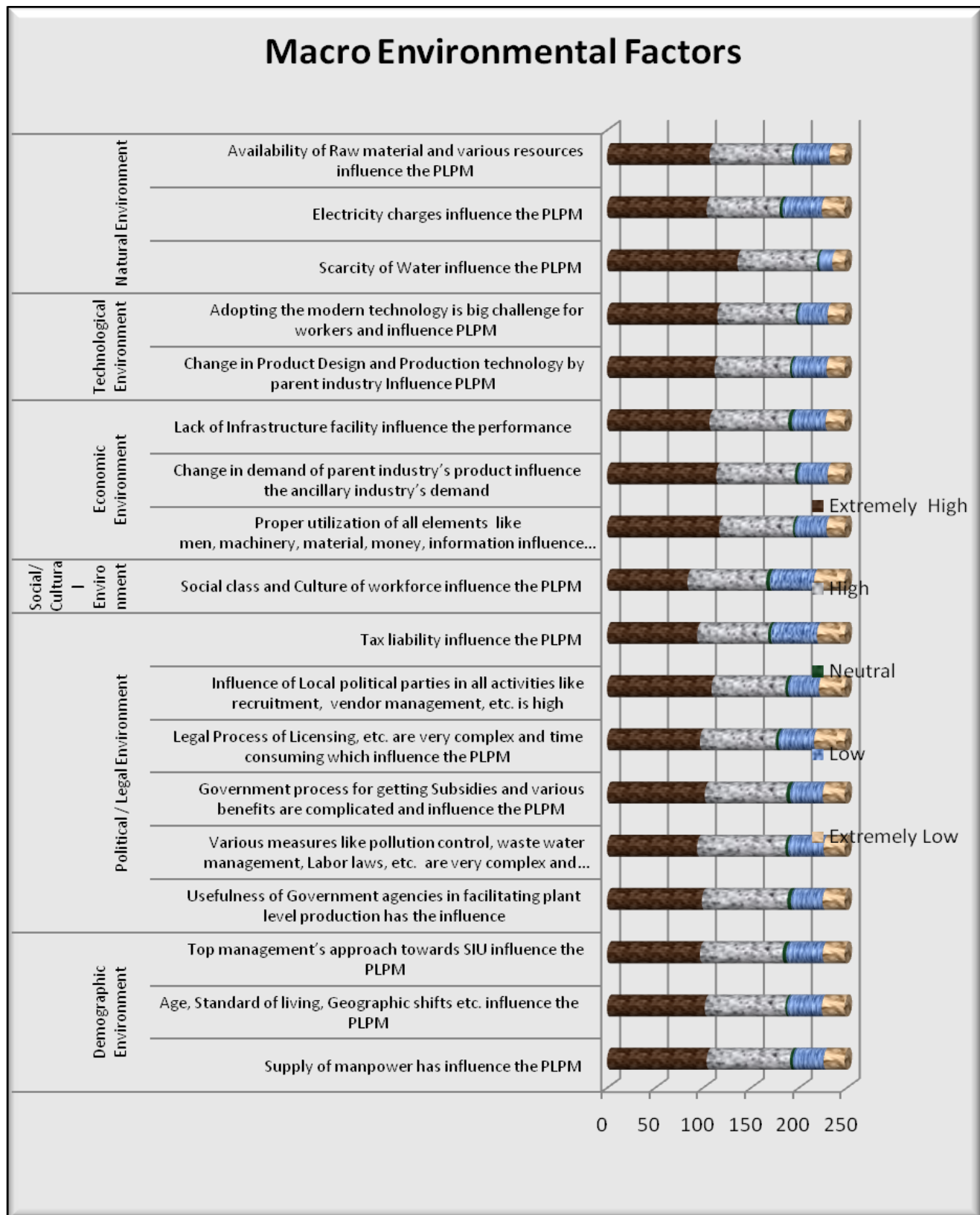


Fig – Frequency distribution of respondents for Macro environmental factors

Hypothesis : The proportion of SIU's influenced by Micro and Macro environmental factors, is greater than 50%.

To test the hypotheses,

The null hypothesis, H_0 : The proportion of managers influenced by Micro and Macro environmental factors is less than or equal to 50%.

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The alternative hypothesis, H_a : The proportion of managers influenced by Micro and Macro environmental factors is greater than 50%.

The test used is z test for proportions.

Test statistics:

$$Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

Here \hat{p} = sample proportion, p_0 = hypothetical value = 50% = 0.50, n = sample size = 248

Part I]

The frequency of managers influenced by Micro environmental factors is given below.

Calculation table:

Micro Environmental Factors		%	Proportion	Z statistic	p value	Significance
Company	Environment within the organization influence the PLPM	70.97	0.71	6.60	0.0000	Significant
	Employer's demographic factors has a influence on PLPM	68.95	0.69	5.97	0.0000	Significant
	Employer's Education, Experience, Technical skills has influence on PLPM	64.92	0.65	4.70	0.0000	Significant
	Employees demographic factors has influence on PLPM	66.94	0.67	5.33	0.0000	Significant
	Employees Education, Experience, Technical skills has influence on PLPM	71.77	0.72	6.86	0.0000	Significant
	Production workers development milieu/ environment has influence on PLPM	56.05	0.56	1.91	0.0284	Significant
	Employees satisfaction has a influence on the PLPM	70.16	0.70	6.35	0.0000	Significant
Suppliers	Suppliers in PCMC region are having more power of bargaining for supplies and having	60.89	0.61	3.43	0.0003	Significant

	influence on PLPM					
	Cost of supplies (Material) is volatile and influence the PLPM	62.90	0.63	4.06	0.0000	Significant
	Non availability of expected quality and quantity of material influence the PLPM	67.74	0.68	5.59	0.0000	Significant
Customers	Expectation of Customers (Client company) are increasing and influence PLPM	76.21	0.76	8.26	0.0000	Significant
	Matching with customers satisfaction and meeting production objective is very difficult	63.31	0.63	4.19	0.0000	Significant
	Customers surplus feel of purchasing always influence the PLPM	75.81	0.76	8.13	0.0000	Significant
	Delay in Payment of Bills influence the PLPM	74.19	0.74	7.62	0.0000	Significant
Competition	Level of competition is very high in PCMC and has a influence	81.45	0.81	9.91	0.0000	Significant
	High level of competition affect Cost of raw material and Price of finish goods	79.03	0.79	9.14	0.0000	Significant
	There is always threat of potential entrants and substitutes	79.03	0.79	9.14	0.0000	Significant
	Level of competition affect factor like Land cost, salaries, distribution cost, Fix overheads, etc.	73.79	0.74	7.49	0.0000	Significant
Intermediaries	Constant and brokers is the better way to approach client companies and affect the business	65.32	0.65	4.83	0.0000	Significant
	Quality and Price issues in dealing with third party vendors is critical	68.95	0.69	5.97	0.0000	Significant
	People involved in SCM are difficult to tackle and has a influence	63.71	0.64	4.32	0.0000	Significant

Public	All the elements like Unions, Labor contractors, etc are difficult to handle and influence the PLPM	74.19	0.74	7.62	0.0000	Significant
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If p value < 0.05 , the level of significance; the null hypothesis is rejected.

Since p value is less than 0.05 for all factors, the null hypothesis is rejected for the all micro factors.

Part II]

The frequency of managers influenced by Macro environmental factors is given below.

Calculation table:

Macro Environmental Factors		%	Proportion	Z statistic	p value	Significance
Demographic Environment	Supply of manpower has influence the PLPM	77.02	0.77	8.51	0.0000	Significant
	Age, Standard of living, Geographic shifts etc. influence the PLPM	75.00	0.75	7.87	0.0000	Significant
	Top management's approach towards SIU influence the PLPM	73.79	0.74	7.49	0.0000	Significant
Political / Legal Environment	Usefulness of Government agencies in facilitating plant level production has the influence	75.81	0.76	8.13	0.0000	Significant
	Various measures like pollution control, waste water management, Labor laws, etc. are very complex and influence the PLPM	75.00	0.75	7.87	0.0000	Significant
	Government process for getting Subsidies and various benefits are complicated and influence the PLPM	75.40	0.75	8.00	0.0000	Significant
	Legal Process of Licensing, etc. are very complex and time consuming which influence the PLPM	70.97	0.71	6.60	0.0000	Significant

	Influence of Local political parties in all activities like recruitment, vendor management, etc. is high	75.00	0.75	7.87	0.0000	Significant
	Tax liability influence the PLPM	67.74	0.68	5.59	0.0000	Significant
Social/Cultural Environment	Social class and Culture of workforce influence the PLPM	66.94	0.67	5.33	0.0000	Significant
Economic Environment	Proper utilization of all elements like men, machinery, material, money, information influence the PLPM	78.23	0.78	8.89	0.0000	Significant
	Change in demand of parent industry's product influence the ancillary industry's demand	79.03	0.79	9.14	0.0000	Significant
	Lack of Infrastructure facility influence the performance	76.21	0.76	8.26	0.0000	Significant
Technological Environment	Change in Product Design and Production technology by parent industry Influence PLPM	77.02	0.77	8.51	0.0000	Significant
	Adopting the modern technology is big challenge for workers and influence PLPM	79.44	0.79	9.27	0.0000	Significant
Natural Environment	Scarcity of Water influence the PLPM	88.31	0.88	12.07	0.0000	Significant
	Electricity charges influence the PLPM	72.58	0.73	7.11	0.0000	Significant
	Availability of Raw material and various resources influence the PLPM	77.82	0.78	8.76	0.0000	Significant

If p value < 0.05 , the level of significance; the null hypothesis is rejected.

Since p value is less than 0.05 for all factors, the null hypothesis is rejected for the all macro factors.

Conclusion:

The proportion of SIU's influenced by Micro and Macro environmental factors, is greater than 50%.

Hence the hypothesis 'The proportion of SIU's influenced by Micro and Macro environmental factors, is greater than 50%' is accepted, **hypothesis is accepted.**

- All values of Micro environmental factors under environmental factors like company environment, suppliers, customers, etc. are significant and state that these factors and actors have the influence on SIUs performance.
- All values are significant including 'Production workers development milieu/ environment have an influence on PLPM' but show the little deviation. Which indicate that SIU needs to focus on Production workers development milieu and same is tasted in hypothesis 8 from management's perspective and workers perspective.
- All values of Macro environmental factors under environmental factors like Demographic Environment, Political / Legal Environment, Social/Cultural Environment, Economic Environment, Technological Environment, Natural Environment are significant and state that these factors and actors have the influence on SIUs performance.

Evaluation of intensity Part a) Micro (Internal) Environmental factors

Micro Environmental Factors		High
Company	Environment within the organization influence the PLPM	70.97
	Employer's demographic factors has a influence on PLPM	68.95
	Employer's Education, Experience, Technical skills has influence on PLPM	64.92
	Employees demographic factors has influence on PLPM	66.94
	Employees Education, Experience, Technical skills has influence on PLPM	71.77
	Production workers development milieu/ environment has influence on PLPM	56.05
	Employees satisfaction has a influence on the PLPM	70.16
Suppliers	Suppliers in PCMC region are having more power of bargaining for supplies and having influence on PLPM	60.89
	Cost of supplies (Material) is volatile and influence the PLPM	62.90
	Non availability of expected quality and quantity of material influence the PLPM	67.74
Customers	Expectation of Customers (Client company) are increasing and influence PLPM	76.21

	Matching with customers satisfaction and meeting production objective is very difficult	63.31
	Customers surplus feel of purchasing always influence the PLPM	75.81
	Delay in Payment of Bills influence the PLPM	74.19
Competition	Level of competition is very high in PCMC and has a influence	81.45
	High level of competition affect Cost of raw material and Price of finish goods	79.03
	There is always threat of potential entrants and substitutes	79.03
	Level of competition affect factor like Land cost, salaries, distribution cost, Fix overheads, etc.	73.79
Intermediaries	Constant and brokers is the better way to approach client companies and affect the business	65.32
	Quality and Price issues in dealing with third party vendors is critical	68.95
	People involved in SCM are difficult to tackle and has a influence	63.71
Public	All the elements like Unions, Labor contractors, etc are difficult to handle and influence the PLPM	74.19

Summary:

The percentage of high is greater than 55% for every area of production management.

Overall comparison: The highest intensity of factor is 'Level of competition is very high in Pimpri-Chinchwad area and has a influence'; then 'High level of competition affect Cost of raw material and Price of finish goods' & 'There is always threat of potential entrants and substitutes'; then 'Expectation of Customers (Client company) are increasing and influence PLPM'; then 'Customers surplus feel of purchasing always influence the PLPM'; then 'Delay in Payment of Bills influence the PLPM' & 'All the elements like Unions, Labor contractors, etc are difficult to handle and influence the PLPM'; then 'Level of competition affect factor like Land cost, salaries, distribution cost, Fix overheads, etc.'; then 'Employees Education, Experience, Technical skills has influence on PLPM'; then 'Environment within the organization influence the PLPM'; then 'Employees satisfaction has a influence on the PLPM'; then 'Employer's demographic factors has a influence on PLPM' & 'Quality and Price issues in dealing with third party vendors is critical'; then 'Non availability of expected quality and quantity of material influence the PLPM'; then 'Employees demographic factors has influence on PLPM'; then 'Constant and brokers is the better way to approach client companies and affect the business'; then 'Employer's Education, Experience, Technical skills has influence on PLPM'; then 'People involved in SCM are difficult to tackle and has a influence'; then 'Matching with customers

satisfaction and meeting production objective is very difficult'; then 'Cost of supplies (Material) is volatile and influence the PLPM'; then 'Suppliers in PCMC region are having more power of bargaining for supplies and having influence on PLPM'; then lastly 'Production workers development milieu/ environment has influence on PLPM'.

Part b) Macro (External) Environmental factors

Macro Environmental Factors		High
Demographic Environment	Supply of manpower has influence the PLPM	77.02
	Age, Standard of living, Geographic shifts etc. influence the PLPM	75.00
	Top management's approach towards SIU influence the PLPM	73.79
Political / Legal Environment	Usefulness of Government agencies in facilitating plant level production has the influence	75.81
	Various measures like pollution control, waste water management, Labor laws, etc. are very complex and influence the PLPM	75.00
	Government process for getting Subsidies and various benefits are complicated and influence the PLPM	75.40
	Legal Process of Licensing, etc. are very complex and time consuming which influence the PLPM	70.97
	Influence of Local political parties in all activities like recruitment, vendor management, etc. is high	75.00
	Tax liability influence the PLPM	67.74
Social/Cultural Environment	Social class and Culture of workforce influence the PLPM	66.94
Economic Environment	Proper utilization of all elements like men, machinery, material, money, information influence the PLPM	78.23
	Change in demand of parent industry's product influence the ancillary industry's demand	79.03
	Lack of Infrastructure facility influence the performance	76.21
Technological Environment	Change in Product Design and Production technology by parent industry Influence PLPM	77.02
	Adopting the modern technology is big challenge for workers and influence PLPM	79.44
Natural	Scarcity of Water influence the PLPM	88.31

Environment	Electricity charges influence the PLPM	72.58
	Availability of Raw material and various resources influence the PLPM	77.82

Summary:

The percentage of high is greater than 65% for every area of production management.

Overall comparison:

The highest intensity of factor is 'Scarcity of Water influence the PLPM'; then 'Adopting the modern technology is big challenge for workers and influence PLPM'; then 'Change in demand of parent industry's product influence the ancillary industry's demand'; then 'Proper utilization of all elements like men, machinery, material, money, information influence the PLPM'; then 'Availability of Raw material and various resources influence the PLPM'; then 'Change in Product Design and Production technology by parent industry Influence PLPM' & 'Supply of manpower has influence the PLPM'; then 'Lack of Infrastructure facility influence the performance'; then 'Usefulness of Government agencies in facilitating plant level production has the influence'; then 'Government process for getting Subsidies and various benefits are complicated and influence the PLPM'; then 'Various measures like pollution control, waste water management, Labor laws, etc. are very complex and influence the PLPM' & 'Influence of Local political parties in all activities like recruitment, vendor management, etc. is high' & 'Age, Standard of living, Geographic shifts etc. influence the PLPM'; then 'Top management's approach towards SIU influence the PLPM'; then 'Electricity charges influence the PLPM'; then 'Legal Process of Licensing, etc. are very complex and time consuming which influence the PLPM'; then 'Tax liability influence the PLPM'; then lastly 'Social class and Culture of workforce influence the PLPM'.

References

- Beghel, D., Parthsarathi, & Gupta, M. (2011). Innovation in Indian Small Scale Industries: Case study of Cosmetics small scale industry in Mumbai. *ASCI Journal of Management*, 41 (01), 91-108.
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