

Study on Productivity Enhancement
in Existing Large and Medium
Industries in Bhutan.



Department of Industry
Ministry of Economic Affairs

Executive Summary

This report is a study carried out on the productivity enhancement of the four identified industry namely the Alloy Industry, Agro and Food based industry, Mineral based industry, Forest and Wood based Industry under the Department of Industry, Ministry of Economic Affairs. The main aim of the study was to assess the productivity of the four industries, and recommend measures with regards to productivity enhancement in production and manufacturing to address the productive capacity limitation. Hence the scope of the study entails a detailed analysis of the following areas outlined below:

- ✓ Identification of the sectors/groups with weak performance;
- ✓ Ascertain the constraints and factors leading to the sub-optimal performance of the identified sectors/groups(if any);
- ✓ Based on the findings of the study, recommendation of the measures to address the constraints faced by the sectors/groups.

Methodology: The study was conducted as a two phase study. In the first phase, **Earning capability analysis method** to analyze the performance of the industries was done. The method was chosen as it is one of the most effective analysis tools internationally, which is effective both in analyzing the industries as well as measuring and managing the values of the companies. (McKinsey & Company, Inc; Copeland Tom; Koller Tim; Murrin Jack, 2000) and (Porter, 1998). Thus, as stated in the project charter (TOR), the consulting team and the Department jointly identified 9 sectors or groups of industries based on their performance. (See full report). Further, in line with the broader objective of promoting sustainable industrial development in the country, four categories of industries were chosen from the data and then a detailed study on each of the industries were carried out. The four categories of industries are:

- a. Alloys Industry,
 - b. Food and Agro Based Industries,
 - c. Forest and Wood Based Industries
- and d. Mineral Based Industries

In the second phase of the study, a semi-structured survey tool was developed referring to the three important World's leading Productivity measurement and management documents namely the Organization for Economic Cooperation and Development (OECD) Manual (2001), Spring Singapore (2011) , and the Asian Productivity Organization Manual (2015). Key Results Area and Key Performance Indicators (KPI and KRA) were identified referring the documents and they formed the key factors of the tool. This survey was first piloted to 15 participants to confirm whether the tool got the intended results. The tool was further modified and then employed to a sample of fifty two industry key stakeholders. Data gathered was analyzed using SPSS 23. The key objectives of the survey were to:

1. Diagnose the business performance of the Identified four Industries.
2. Reasons for the under or good performance of the industries
3. Validate the reasons for the performance by the identification of key factors that enhanced business competitiveness and sustainability through various product, process, people and policy initiatives in the identified industry.
4. To identify the impact of internal or external factors on the productivity of the industry.

The analysis of the entire data was then done using SPSS 23. Repeated KIs were merged into and finally merged with lessons learned from the study and recommendation was gathered for related and key stakeholders. Field observations and interviews of key informants were collected to validate the data.

Key findings, Recommendation and Conclusion of the study

Though the study tried to assess the factors common to all the sectors, due to the heterogeneity of the sectors, the nature of individual business, product and markets, data on common factors affecting industrial performance was scattered through all the factors, and hence it was difficult to ascertain common factors. However, some common factors influencing the productivity of all the industry have been discussed below.

Key Finding 1: One of the most important finding of this study is that all industries irrespective of their heterogeneity are chiefly affected by external market factors. These external market factors include economic conditions, change in the market demand, change in the government policy, change in the labor market, raw materials sourcing, foreign currency problem, capital sourcing and cost of capital, and change in the price of the electricity. In contrast, almost all the industries responded as being positively impacted by internal market factors. The internal factors include management system in the industry, labor productivity, productivity measurement system, financial and marketing system, energy utilization systems, entrepreneurial and leadership style.

Key Finding 2: Those industries not affected by either internal or external factors were industries with international affiliation who had their base elsewhere and therefore several of their external factors were taken care of. Both the inbound and outbound logistics (Porter, 1998) were taken care of by excellent management and leadership team, use of latest technology and therefore the result in high quality of product as compared to other industry targeting only local or regional market. These companies also had excellent relationship with subsidiary companies who supplied them with core raw materials and technology and other support. Because they had a ready market outside of Bhutan, they were self-sustaining and had created a product and business brand in the market. Internal factors were taken care of by these industries also followed a systematic and professional leadership and management style as well as an up to date productivity and financial measurement system.

Key finding 3: In the process of the study, there were one or two cases of industry performing extremely well in terms of not being disturbed by either internal or external market conditions. Upon enquiry it was found that these industries were showing indicators of organizational resilience. Organizational resilience is described as the ability of an organization to anticipate, prepare for, respond and adapt to incremental change and sudden disruptions in order to survive and prosper. Organizational resilience is achieved as a result of having the ability to anticipate, prepare for, respond and adapt to events – both sudden shocks and gradual change. It means being adaptable, competitive, agile and robust.

Key finding 4: The study also found that there is the necessity of maintaining a close and proper communication between the Department of Industry (DoI) and firms scattered throughout the country. While just investigating on four of the 52 firms, it was most difficult for the consultancy team to gather records; one can imagine the difficulty and complexity if there is a need to gather information of all the firms under the DoI. While it is understandable that each of these business houses would have their own business secrets that they would not want to share, the maintenance and transparency of some basic documents like audited financial reports, human resource information and cost sheets would help any industry in making strategic decision as well as dispel miscommunication and compartmentalization in the industry which would otherwise result in impacting the industry adversely. Further, the availability of these documents can help the government to take an informed decision on any matters as and when needed. Recommendation on what specific and strategic action can be taken by the DoI to develop transparent and accurate communication is given under general recommendation of this report.

Key Finding 5: The financial records from 2008-2014 clearly indicates an upward trend for all the industry in Bhutan. In addition, data on international front also show a positive market mood in the regional and global market at present. These have made the neighboring countries like India and China take several initiatives. (see details in individual industry report). These positive trends should give enough motivation to take proactive measures in enhancing the industrial productivity.

Recommendation and Conclusion

In conclusion, the study found that given a timely support and an informed guidance by the government and a positive and proactive outlook of the industry , most of the findings suggest a positive trend towards better productivity and growth of the industry in future. Literature review of the government documents reveal ambitious projects like Industrial Infrastructural Development Projects initiated in the various regions of the country by the government. While these projects are needed and must have been done in good wisdom, this study found that the expansion and marketing, consolidation and support of the existing industry is equally if not more needed. Some ways of consolidation and support can be in the following areas:

- a. Government can assist the industry by establishing Business Development Center (BDC) in each Embassy. Where there is market in the relevant country, Industries can be informed or are asked to carry out the road show for the same.

- b. ***In acute emergency situation***, the government can keep the electricity tariff flexible as per the demand and supply of the electricity. If the industry need more energy at the lesser price for the certain period of time, it may be allowed at the constant price, but the difference could be paid back to the BPC at the later date with agreed interest rate. This will help the industry to play around with seasonal price fluctuations. The credit rules and regulations may be agreed between the financial institutions, RMA and relevant agencies (MOEA AND MOF).
- c. In continuation to the above point, the development of **Business Flood Warning Systems** is also seen as highly important. This system can be a platform where the Government, Financial Institutions in collaboration with Association of the Bhutanese Industry (ABI) and Bhutan Chamber of Commerce (BCCI) can meet to share relevant and monitored information to act proactively towards any kind of emergencies linked to business and industry. Discussion and follow-up on important issue as business flood warning system can garner discussions to move the industry towards being resilient.
- d. The present practice with regards to monitoring and evaluation of the various industry by the Dol is very huge and scattered as one small cell with seemingly limited human resource have to take care of monitoring a industry as large as nine sectors consisting of more than hundred large and medium industry. It is important that for a industry so large, monitoring of performance of each industry should happen individually and collectively. Hence it was seen that the Government should invent mechanism to focus on monitoring at three stages. At the macro Level (where Corporate Governance should be strengthened), at meso-Level (where proper human resources are being field in) and at Micro level (Accounting and Financial Information are kept properly for the ready reference).
- e. In addition, amongst the industry respondents, though majority of the participants stated that they do not have problem with human resource in the survey, field observation and personal communication with key informants gave quite a different view. The reluctance in sharing any problems related to human resource can hint at many things, amongst others, fear of adverse action from management. The study recommends that recruitment of adequate and educationally proficient human resource can give the industry its much needed industrial boom. While Industrial giants like India and China have set aside huge capital for human resource development to take them to become economic giants, Bhutan can learn lessons from them to move along similar path. Educationally well-endowed and skillfully talented workforce can take the industry towards becoming resilient by following an inclusive and participatory approach towards capacity building rather than top down policy demands.
- f. As stated "Without a standard there is no logical basis for making a decision or taking action." (Spring, Singapore, 2011) Government must educate each industry on Productivity Measurement and Enhancement System. Currently there is no baseline study being done for each category of the industry's productivity. It is highly recommended that separate study focused on baseline survey on Industry Productivity may be carried out with immediate effect.

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Abbreviations

Sl.No	Abbreviations	Acronyms
1	ABI	Association of Bhutanese Industrialist
2	APO	Asian Productivity Organization
3	BCCI	Bhutan Chamber of Commerce and Industry
4	BIMC	Business Intelligence and Marketing Center
5	C&B	Cement and Building Materials
6	FW&B	Food, Water and Beverages
7	I&S	Iron and Steel Industry
8	IIS	Integrated Industry Information System
9	ISO	International Standards Organization
10	JIT	Just in Time
11	M&E	Monitoring and Evaluation
12	M&M	Mining and Minerals
13	NEC	National Environment Commission
14	NOP	Non Operation
15	NOPAT	Net Profit After Tax
16	O	Others (Uncategorized industries)
17	OECD	Organization for Economic Co-operation and Development
18	OP	Operation
19	WBI	Wood Based Industry

CHAPTER I: Background and Context

1.1 Background

Bhutan witnessed growth of manufacturing industries, thus, diversifying the industrial product base and activities. While statistically, the vast majority of manufacturing industries are wood based, more sophisticated mineral based and chemical industries figure out in the major industries list of the country. Manufacturing industries face stiff competition in terms of market, technology change, product obsolescence, raw materials sourcing and process adaptation among others. Consequently, these industries are unable to attain full capacity utilization. Records maintained with the Department show that a significant number of industries have been operating under loss and a considerable number of industries operate below 50% of their installed capacity level indicating a sluggish performance by the industries.

While substantial effort has already been put in towards promotion of new industries, very less has been done to enhance productive capacities of existing industries. It is therefore timely and appropriate to conduct a detailed study to identify the key constraints and suitable measures to enhance the productivity in the existing industries in line with the Department's objective of broadening the industrial base and to accelerate industrial growth in the country. As such, there is a need to create and expand productivity capacity of the existing industries through adoption and improvement of modern technologies, improvement in skills, adherence to the established quality standards and participation in the domestic and international markets for the development of a competitive industrial sector in the country.

In this particular study though the secondary data revealed that the industries on study were financially performing well up until 2014, increasing evidences of complaints from the field, anecdotal records, and unaudited financial statements published in the National newspaper suggested the profit level of these industries actually showing a downward trend, due to unidentified reasons. Therefore, in order to diagnose the factors leading to sluggish performance of the identified industries, standard diagnostic tools (*Standard Questionnaires and Key Informant Interviews*) were developed to see where the gaps existed (if any). This study is, therefore, intended to clearly spell out factors contributing to the sluggish performance of the industries. The study's aim is to provide necessary interventions required to enhance their performance, and hence the strategies if implemented carefully can bring about tangible improvement in the productivity of the industries and help Bhutanese industries move up the value chain.

1.2 Objectives:

Carry out a detailed study on productivity enhancement in production and manufacturing industries in Bhutan to address the **productive capacity limitations**. Further the specific key objectives of the study were:

1. Diagnose the business performance of the Identified four Industry.
2. Reasons for the under or good performance of the industry
3. To validate the reasons for the performance by the identification of key factors that enhance business competitiveness and sustainability through various product, process, people and policy initiatives in the identified industries.

4. To identify the impact of internal or external factors on the productivity of the industries.

1.3 Scope of the Study:

The consulting firm was to carry out a comprehensive study on the current situation for the **production and manufacturing industries** in close consultation with the Department of Industry (DoI), Ministry of Economic Affairs (MoEA), and other relevant organizations chiefly in the following areas outlined below;

- ✓ Identify the sectors/groups with weak performance;
- ✓ Present the findings of the analysis to the Client and determine the list of sectors/groups jointly with the Department for further assessment;
- ✓ Undertake a detailed study to ascertain the constraints and factors leading to the sub-optimal performance of the identified sectors/groups (if any);
- ✓ Based on the findings of the study, recommend measures to address the constraints faced by the sectors/groups.

The recommendations were also to cover the following areas:

- ❖ Quality improvement, both in terms of processes and products,
- ❖ Raw materials sourcing at competitive price,
- ❖ Technology and technology up-gradation needs of the industry by providing information on successful experiences and world-wide best practices in the area,
- ❖ Marketing strategy in the key markets and on various export-promotion measures,
- ❖ Energy utilization and scope for improvement in energy efficiency,
- ❖ Product diversification and/or up scaling in the value chains that will improve competitiveness of the sectors/groups in both domestic and international markets,
- ❖ Strategies to improve efficiencies in human related capital (skills, entrepreneurial capabilities, managerial and organizational methods),
- ❖ Strategies to improve efficiency and creativity in use of factors of production leading to increased productivity, and
- ❖ The required enabling policy environment for the sectors/groups' growth.

CHAPTER II. RESEARCH METHODOLOGY

2.1 Data Collection tools and Analysis Procedure:

Data was collected and analyzed in two phases as outlined below

Phase I: Identification of least performing industries in Bhutan

Phase II: Factors leading to weak performance of industries in Bhutan and productivity enhancement findings, analysis and recommendations

Phase I: the Scope of Work in phase I entailed the following two tasks.

- ✓ Identify the sectors/groups with weak performance;
- ✓ Determine the list of industry into sectors/groups

Nine industry/sectors were identified based on their financial performance (2011-2014). These industry were tabulated and analyzed to find out the performance and positioning in the economy using the **Earning capability analysis method**. (McKinsey & Company, Inc; Copeland Tom; Koller Tim; Murrin Jack, 2000) and (Porter, 1998). The Earning Capability Analysis method explains the process of averaging and analyzing the series of industry's historical financial performance (net profit) to value the industry at the particular point of time. The result was the emergence of nine categories of Industry identified based on the nature of the industry. The nine categories of industry are listed below.

Category of the Industry:

1. Alloy Based industry
2. Alcohol and Beverages Industry
3. Food and Agro Processing Industry
4. Forest and Wood Based Industry
5. Iron and Steel Based Industry
6. Mineral Based Industry
7. Mining and Quarry Based Industry
8. Plastic and Packaging Industry
9. Others

Phase II:

In Phase II, the list of sectors/industries was narrowed down to four for further assessment. Subsequently, data was collected using a semi-structured survey tool which was developed referring to three of the World's leading Productivity measurement and management documents. These were the Organization for Economic Cooperation and

Development (OECD) Manual (2001), Spring Singapore (2011) document and the Asian Productivity Organization Manual (2015). Key Results Area and Key Performance Indicator (KPI and KRA) were identified referring the document and they formed the key factors of the tool. This survey was first piloted to 15 participants to confirm whether or not the tool got the intended results. The tool was further modified and then employed to a sample of fifty two industry key stakeholders. Data gathered was analyzed using SPSS 23. The key tasks of the second phase study entailed the following.

1. Diagnose the business performance of the Identified four Industries. The diagnostic section of the questionnaire looked at two important factors.

1a. Internal factors impacting the industry: This section of the questionnaire was directed towards knowing:

- a. Whether or not each industry feels their business performance were negatively impacted by various internal factors over the years.
- b. If they agree or feel that they were negatively impacted, the industry were asked to identify the factors affecting their performance in the scale of 1-10 (10 being the most severe factors affecting the performance of the industry and 1 being the factors least affecting their business performance).
- c. Another section of the questionnaire was designed to diagnose the factors positively impacting resilience of the industry for comparative study within the industry.
- d. Furthermore, in order to check the organizational systems in place the study further enquired about the Strategic Management and Productivity Measurement Systems in the organization.
- e. Lastly in order to further support the **Value Chain and Productivity Analysis of the Industry**, the study further enquired about the Product, Process, People and Policy initiatives as developed by the APO, and whether this was practiced by each industry to sustain and enhance their business productivity. In order to quantify and calculate the index of each initiative taken by the industry (**Key Result Areas- KRAs**), and number of statements were **Key Performance Indicators (KPIs)** identified using the APO guideline. Six KRAs and 32 KPIs (including the external factors impacting the industry's performance) were developed and distributed to the industry to find out the Productivity Implementation Index of each KRA which were then analyzed accordingly. (See Annexure 9)

1b. External Factors impacting the Industry

Out of six KRAs, fifth KRA (External Factors impacting the performance of the industry) were developed to identify the scale of impact of external factors in the performance of the industry. Eight Key Performance Indicators (KPIs) were developed and distributed to various industries for the study as mentioned in the Analysis Chapter. (See Annexure 1). Other tasks in this phase entailed the following:

2. *Identify the reasons for the under or good performance of the industry;*
3. *Validate the reasons for the performance by the identification of key factors that enhanced business competitiveness and sustainability through various product, process, people and policy initiatives in the identified industry;*
4. *Identify the impact of internal or external factors on the productivity of the industry.*

2.2 Limitation of the study:

The study is the first of its kind as this is the first time the Government has carried out a study on Productivity enhancement of the existing large and medium scale industry in Bhutan. As such, due to the lack of available documents (both Government and Private) the quality and the accuracy of the study was directly dependent on the extent of the information provided and shared by the project team, various stakeholders, key informants, organizations and implementing agencies. The study therefore is limited by the following points:

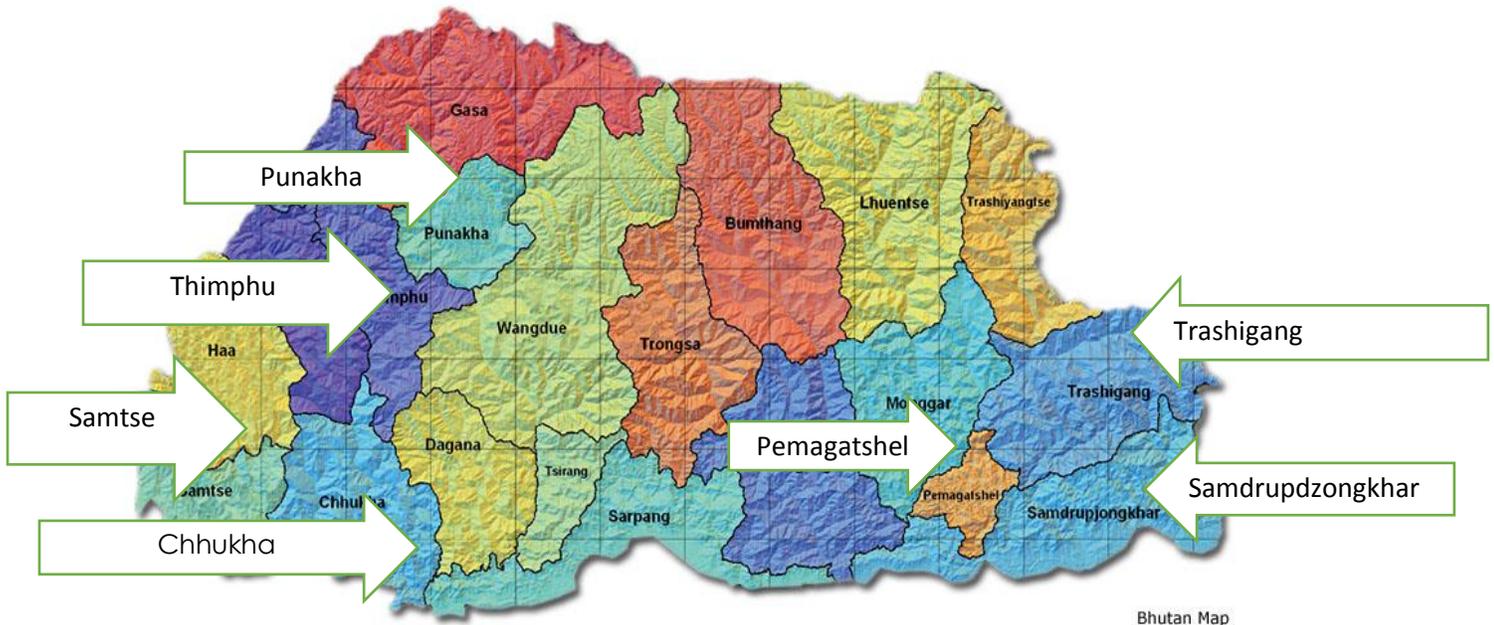
1. One of the strongest limitation of the study is the unavailability of the verified information of the different industries. This limitation has been one of the strongest factor impacting the results of the study.
2. To establish concrete benchmark, accurate and transparent sharing of the information by the participants is necessary. Personal communication and field observation revealed a reluctance in sharing the company secrets and discussing any matters related to Productivity. Hence, the study could not assess and calculate internal benchmark. However, review of external benchmark has been done based on the APO data.
3. Though, quantitative data collected in the survey questionnaire revealed all the industries as having their Strategic Productivity Measurement System document in place, when asked of the document, none of the agencies provided the consultancy team with the document. Hence the report is limited by the physical presence of this strategic document.

CHAPTER III: FINDINGS AND DISCUSSIONS

3.1 Background and Demographic Information

This section of the study captures the information from Primary and Secondary data in order to critically look at processed data and its behaviour to see some of the challenges faced by the four category of industry under study in its growth and development. The figure below represents the regional distribution of the industry under study.

Figure 1: Regional Representation of the Industry for Study



Further, Study sites and detail demographic information is presented below:

Table 1: Demographic information of Industry under Study

Q1_Dzongkhag		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chhukha	33	63.5	63.5	63.5
	Pemagatshel	2	3.8	3.8	67.3
	Samdrupdzongkhar	4	7.7	7.7	75.0
	Samtse	5	9.6	9.6	84.6
	Thimphu	7	13.5	13.5	98.1
	Tashigang	1	1.9	1.9	100.0
	Total	52	100.0	100.0	

In addition, the study was conducted on the following categories of industries. Frequency of the industry and their respective percentage is represented the data below.

Table 2: Category of Industry for Study

Q6_Category of Industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alloy Industry	10	19.2	19.2	19.2
	Mineral Based Industry	14	26.9	26.9	46.2
	Agro and Food Based Industry	13	25.0	25.0	71.2
	Forest and Wood Based Industry	15	28.8	28.8	100.0
	Total	52	100.0	100.0	

Table 2 above explains clearly that the data (population) was collected from industries located at Chhukha (Industrial Estate) which represents 63% of the total population, Thimphu Dzongkhag representing the second highest (13%), in the third place Samtse (11.1%) followed by Samdrupdzongkhag (7.4%), Pemagatshel (3.7%) and then Trashigang (1.9%). Of the 52 firms, 10 belong to Alloy Industry, 14 Mineral Based, 13 Food and Agro Based including Alcohol and Beverages, and 15 Forests and Wood Based industry as mentioned in the table 1 above. Among 52 firms for study, 35.2% were under large-scale industry (Investment above Nu.100.00 million), 50% were of Medium-scale Industry (Investment of Nu.10-100 million) and 14.8% of were Small-scale Industry (Nu.1-10 million) particularly under wood based industry (Sawmills) to see some of the problems in their growth as mentioned in the table 3 below:

Q4_Scale of Industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Large Industry	18	34.6	34.6	34.6
	Medium Industry	26	50.0	50.0	84.6
	Small Scale Industry	8	15.4	15.4	100.0
	Total	52	100.0	100.0	

Table 3: Scale of Industry for study

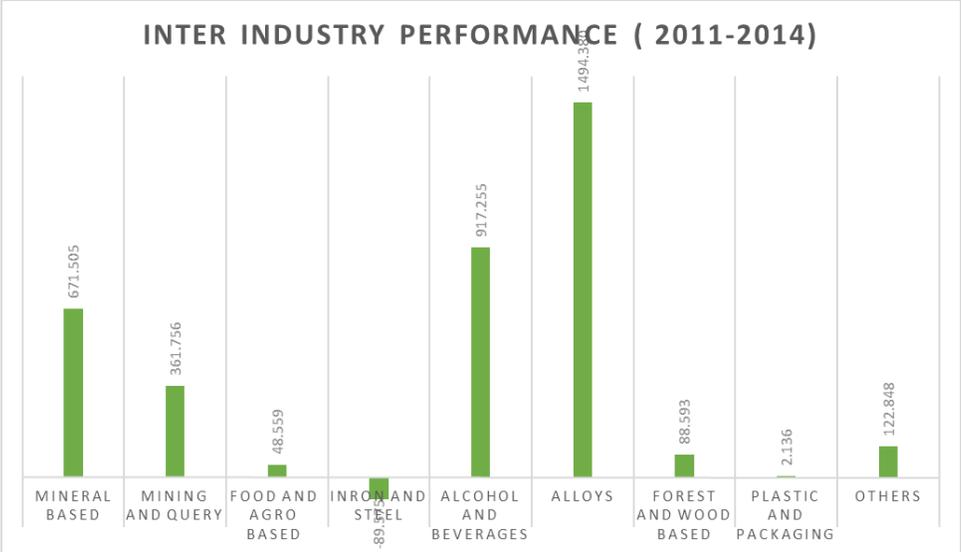
The information was gathered from various firms through the Key informants who were directly involved in leading and managing the firms as reflected in table 4 below:

Designation of the Respondents					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CEO or MD or JMD	8	15.4	15.4	15.4
	Director or Manager	44	84.6	84.6	100.0
	Total	52	100.0	100.0	

Table 4: Respondents by Profession

As stated earlier in the report, first secondary data was analyzed to see the categories of industry and their performance from 2011 to 2014. Findings suggested that *Iron and Steel Industry* was in the lowest scale followed by *Plastic and Packaging Industry* and then *Food and Beverages*. Whereas Alloy, Alcohol and Beverages, Mineral based Industry were relatively performing better. The table below presents the inter- industry performance from 2011 to 2014.

Figure 2: Inter Industry Performance (2011-2014).



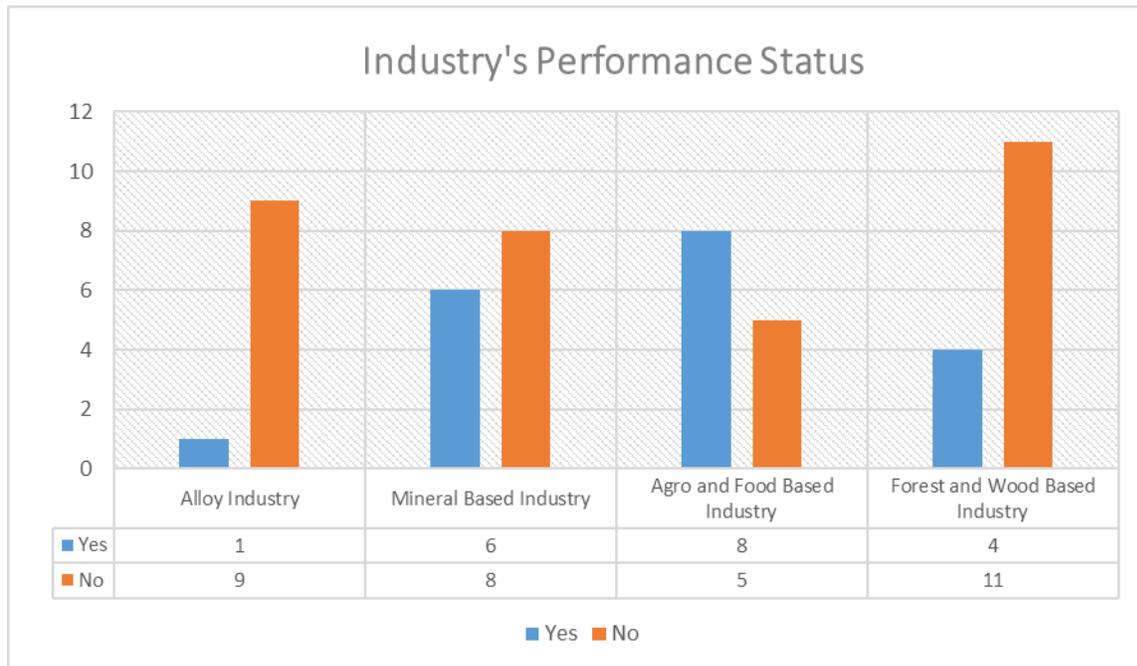
3.2 Diagnosis of the Factors Affecting Industries' Business Performance.

3.2.1 General characteristics of Industries' performance

This section of the study was targeted to find out the financial performance of the industries till 2014 (as found in the PHASE -I of the study) and thereafter, and the reasons for their performance. Upon analysis of data, it was found out that, out of the 52 firms interviewed, 19 firms confirmed that they are doing well even after 2014, while the rest (33) confirmed that they have not been doing well after 2014. As represented in Figure 2 below, other three firms are comparatively performing better than the Alloy Industry. Among the best performing industry, Alcohol, Agro and Food Based Industry are relatively better performing than the other Industry as mentioned in the Figure 2 where the maximum (8 industry) responded as *performing well*, as compared to other industry. There could be

various reasons, but amongst others, it was mainly due to the market availability of products both within and outside the country like mineral water, fruits products, alcohol and beverages. This report reveals that Forest and Wood Based Industry like furniture manufacturing, ply board and others are not able to grow to its fullest, which is further explained in the figure 3 below:

Figure 3: Industry Performance Status



3.2.2 Characteristics of Specific Industry and their analysis

This section is critical in identifying and analysing the most important factors affecting the four industries under scrutiny. The factors are of both internal as well as external. Once the factors are identified, each industry's internal strengths were further validated quantitatively through its Key Results Areas (KRAs) and Key Performance Indicators (KPIs) in the subsequent areas. However, in this section, it explains industry-wise, why each category of industry is pressed upon and by which factor, and hence are not able to perform well. It is very important to understand the ranking of the severity of the problem faced by each industry in the scale of 1-10. 10 being the number one problem faced currently by the industry and 1 being the least problem for the industry. The problems were marked as follows and respondents were asked to rank as per their perception.

- ✓ Human Resources
- ✓ Obsolete Technology
- ✓ Leadership
- ✓ Management System
- ✓ Raw Material Sourcing (Uneconomic & Unreliable)
- ✓ Poor Market Conditions (External)
- ✓ Sales & Marketing Management System
- ✓ Inefficient Energy Supply

- ✓ Poor Quality of the Products
- ✓ Any other reasons.....

Findings suggest that, almost all the industries had no issues related to internal system (*Human resource, obsolete technology, leadership, management system, and poor quality of the products*). The industries' problems were connected to external factors like raw material sourcing (transportation risk and cost), poor market conditions (lack of demand), sales and marketing management system (lack of market information).

The following sections present the in depth account of each of the industry, and its related factors with analysis.

3.3 Individual Industry:

Best Practices, Findings and Analysis, and specific recommendation

3.3.1 Alloy Based Industry

Globally, market for Ferrosilicon, Manganese Alloys, and other Metals has been passing through the most difficult phase of the business since 2008. Many mega plants in China and India are shutting down due to the stiff competition among the industries. Erratic price fluctuations of the energy in the global market have shaken the Alloy Industry around the Globe (Industry, 1999-2013). Report from World Steel Association clearly marks that the demand for the Steel all over the world has been on the downward trend till 2015 (World Steel Association, 2015). In such worst scenario of the market for Ferrosilicon, Manganese alloys, and other metals, the Alloy industry around the region like Malaysia and China, are strategizing to survive the global economic slump in the metal industry by adopting **Owner-Operator Model** or **Centralized Operating Model**. This model help organizations in lowering costs while managing operational risks(OM Holdings Limited, 2014). Keeping this world scenario in the backdrop, the following sections present the findings and analysis and specific recommendation of the Alloy Industry.

3.3.1.1 The Alloy Industry- Strengths

As reported earlier, the analysis of recent secondary data revealed that the performance of industry as showing an upward trend. As per the financial statements of the last eight years, Alloy Industry in Bhutan was enjoying the best of profitability. Figure 4 below shows that average profit of each Alloy Industry was around 297-300% per annum. Moreover, each industry was manufacturing the products at the machine capacity of more than 100%. Individual industry under the Alloys Industry is presented in table form as below.

Figure 4: Performance of the Alloys Industry

Industry Name														
Year	BEFAL	Bhutan Silicon Metals	Bhutan Carbide & Chemicals	Bhutan Ferro Industries	Druk Ferro Alloys	Druk Wang Alloys	SD Earstern Bhutan Ferro Silicon	Bhutan Ferro Alloys	Saint Gobain Ceramics Materials	SKW Tashi	Pelden Enterprise	Ugen Ferro Alloys Pvt. Ltd.	Total	
Tax paid to the Government for last Eight Years (2008-2015)													Profit %	
2015														
2014		0	31.59		37.581	24.077	31.458	189.35	14.700	0	12.300	37.857	378.913	541.3
2013		0	22.131	12.937	28.828	34.732	8.301	48.680	18.000			37.830	211.439	302.06
2012	39.490	0	12.800	3.021	22.179	23.617	13.115						114.222	163.17
2011	86.840	0	3.49		28.447	73.073	54.007						245.857	351.22
2010	130.820	0	0	8.212	23.658	36.015	50.445						249.15	355.93
2009	51.150	0	0	0		0							51.15	73.071
2008		0											0	0
Profit distribution between the Government and the Companies													208.4552	297.79

Figure 5: Labor productivity in Alloy Industry

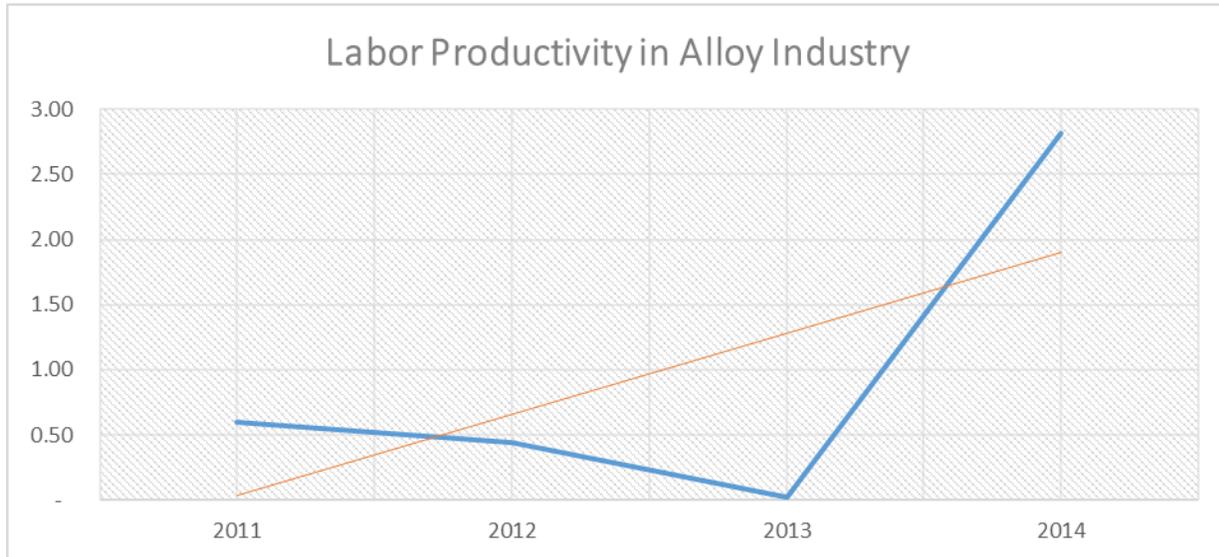


Figure 6: Factors of Production Productivity Trend line (General)

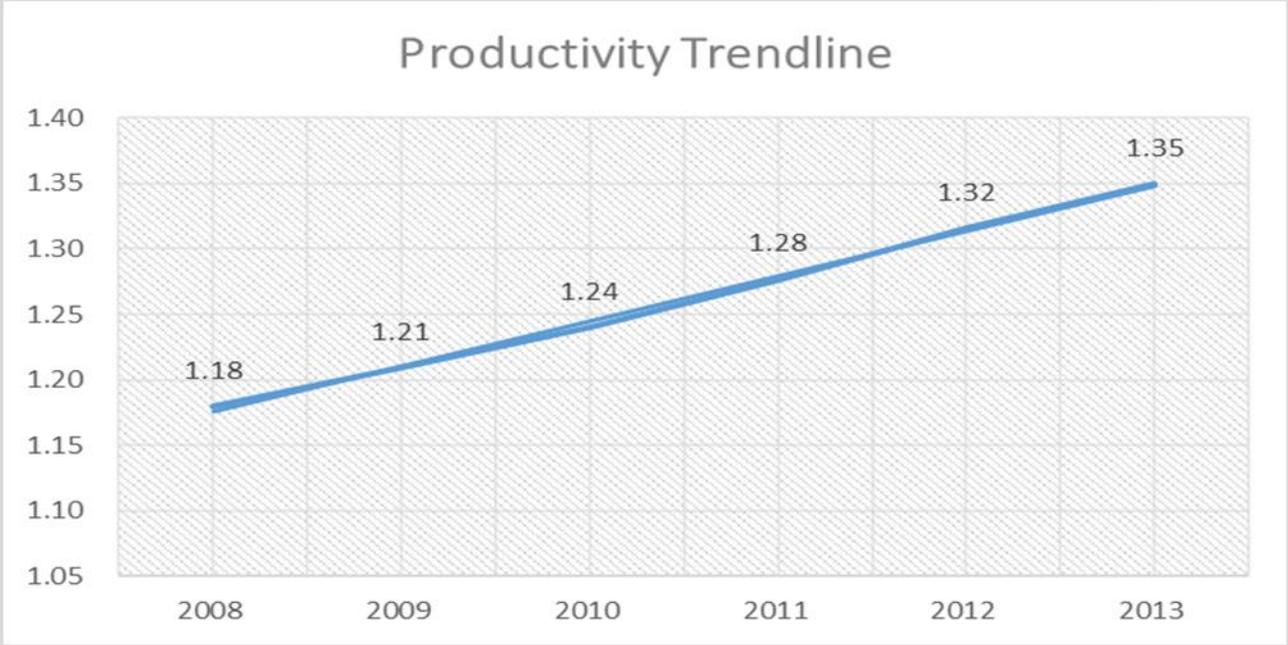
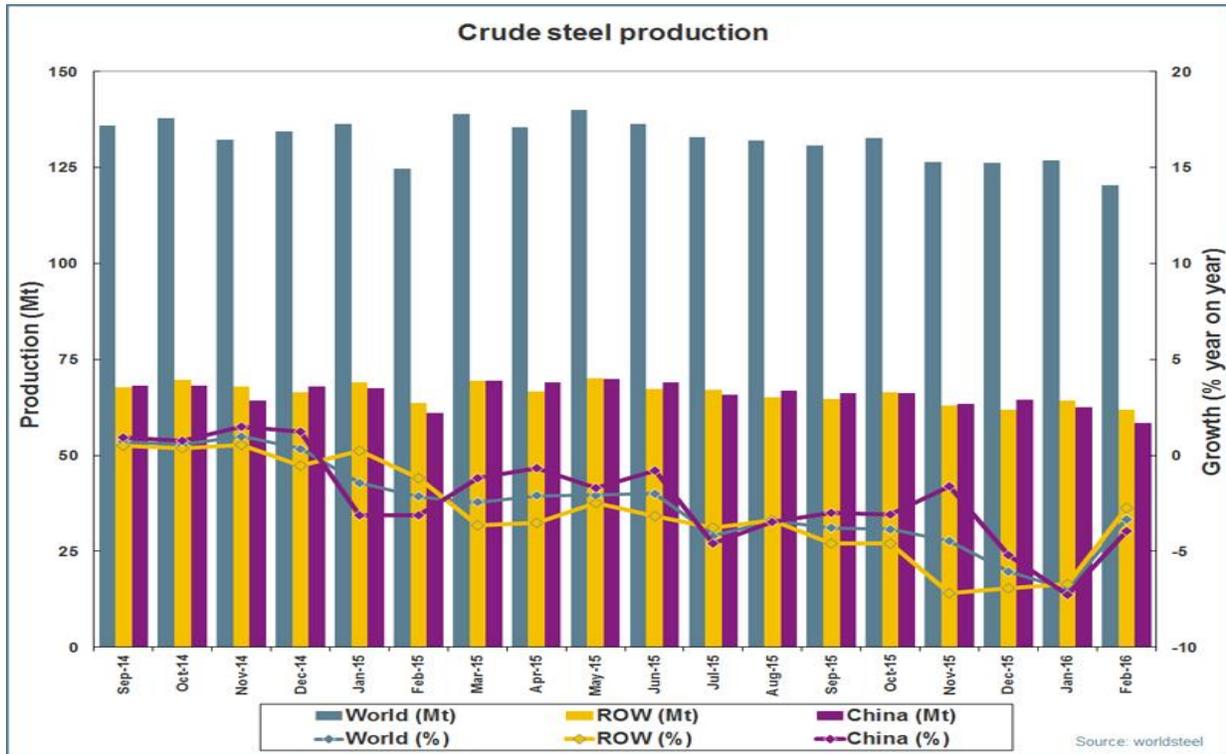


Figure 7: Profitability Trends of Alloy Industry (Source: Industrial Information, DOI)



Figure 8: World Steel Capacity Utilization Ratio Figure 9: Crude Steel Production



All of the evidences above in the existing data, (the upward slope of the profitability trend line, the upward slope of the labour productivity trend line, and factors of production productivity trend line) clearly depict the positive upward trend of the profit margin in future, keeping all the factors of production constant. Furthermore, globally, steel utilization ratio is on the upward trend followed by crude steel production since February 2016 as mentioned in the figure 7 and 8 above which will positively impact the Alloys Industry. The downward trend after 2015 is a scenario that has been temporarily aggravated by the global economic crisis, regional competition and oversupply of the steel products in the market. Therefore, it can be said that the perceived downward trend of the profit of the Alloy Industry since 2015 is of cyclical and temporary in nature.

In the second phase of the study, adapting on Michael Porter's model of value chain analysis, items developed checked if the Alloy industry was doing as well after 2014. Item 11 of the questionnaire asked the respondents to confirm if their company was doing well in business. If they responded as NO, then they were asked to answer item 12, where the respondents were asked to identify the critical factors affecting their business. Out of ten industry, nine of the industry expressed that their business is in the downward trend and the reason they identified from the list were (1) Poor Market Conditions (9 out of 10) being the number one problem in the severity scale, followed by Sales and Marketing (lack of market information), Raw material sourcing (especially

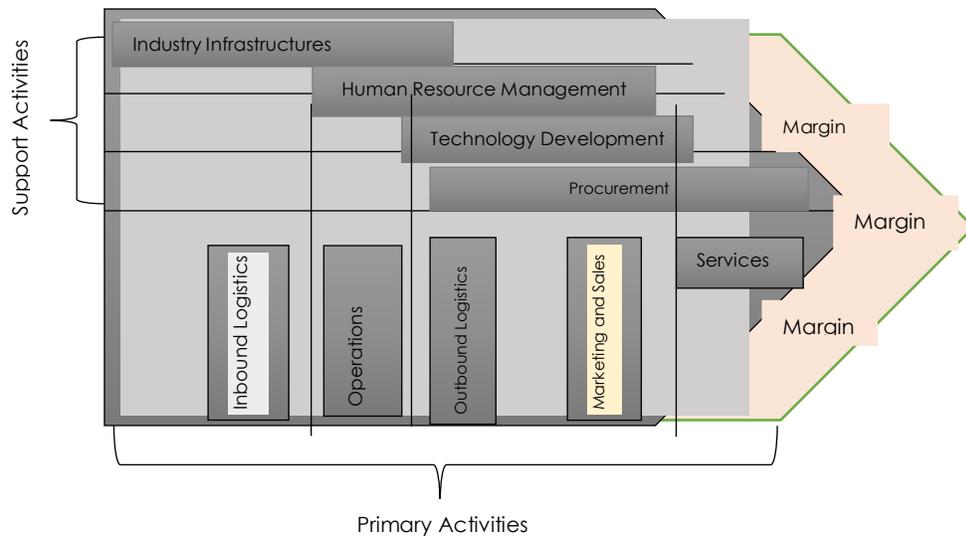
on transportation and transportation risks) and Inefficient Energy Supply in relation to erratic electricity tariff. The finding is presented in tabular form below.

Table 5: Factors Affecting the Profitability of the Alloy Industry

Factors Affecting the Profitability of the Alloy Industry											
1	ALLOY INDUSTRY	Total Industry									
		Severity									
Factors Identified the deterioring		NO: 1	NO:2	NO:3	NO:4	NO:5	NO:6	NO:7	NO:8	NO:9	NO:10
a	Human Resources						1				
b	Obsolete Technology									8	
c	Leadership								8		
d	Management System							8			
e	Raw Material Sourcing (Uneconomic & Unreliable)			8							
f	Poor Market Conditions (External)	9									
g	Sales & Marketing Management System (Lack of information)		8								
h	Inefficient Energy Supply (Focus on Price)				8						
i	Poor Quality of the Products								8		
j	Any other reasons										8

Further, each industry was analysed to assess their performance following the value chain analysis.

Figure 10: Michel Porter's Model of Value Chain Analysis



According to Porter (1998), for an industry to flourish, there are two important support systems (Primary support and support activities) that are necessary. The first is the Primary support which includes the following.

Inbound Logistic: Activities associated with receiving, storing, and disseminating inputs to the product, such as material handling, warehousing, inventory control , vehicle schedule, and returns to suppliers.

- a. **Operations:** Activities associated with collecting, storing, and physically distributing the product to buyers, such as finished goods warehousing, material handling, delivery vehicle operations, order processing and scheduling.
- b. **Outbound Logistics:** Activities associated with collecting, storing, physically distributing the product to buyers, such as finished goods warehousing, material handling, delivery vehicle operation, order processing, and scheduling.
- c. **Marketing and Sales:** Activities Associated with providing a means by which buyers can purchase the product and including them to do so, such as advertising, promotions, sales force, quoting, channel selection, channel relations and pricing.
- d. **Service:** Activities associated with providing service to enhance or maintain the value of the product, such as installation, repair, training, parts supply and product adjustment.

On the other hand, support activities include:

- a) **Procurement:** Procurement refers to the function of purchasing inputs used in the firm's value chain. Purchased inputs include raw materials, supplies, and other consumables items as well as assets such as machinery, laboratory equipment, office equipment and buildings. (
- b) **Technology Development:** Technology development consists of a range of activities that can be broadly grouped into efforts to improve the product and the process.
- c) **Human Resource Management:** Consists of activities involved in the recruiting, hiring, training, development and compensation of all types of personnel.
- d) **Industry Infrastructure:** Industry Infrastructure consists of a number of activities including general management, planning, finance, accounting, legal, government affairs, and quality management. Infrastructure, unlike other support activities, usually supports the entire chain and not individual activities.

The study further looked into the organization Systems to further verify if these systems were in place to view the sustainability of the industry. Referring to the (Asian Productivity Association , 2015) ,two important documents called Strategic Planning and Productivity measurement system were also verified. These two documents form the guideline to the industry in gearing towards internal and external effectiveness and efficiency. Thus, each document was checked separately as mentioned below.

3.3.1.2 Strategic Management System

The main purpose of the study was to find whether or not the existing industry is performing well, and also to assess the factors causing the present industrial performance. In order for an organization or an industry to succeed, every organization must have its own set of vision, mission and target to achieve. The organization must

plan and set target for the growth and development of the organization. Best practices around the world have confirmed that productivity and success of any organization is directly depended on the kind of planning and management the organization follows. Hence this study tried to look at each industries' Strategic Planning and Management document.

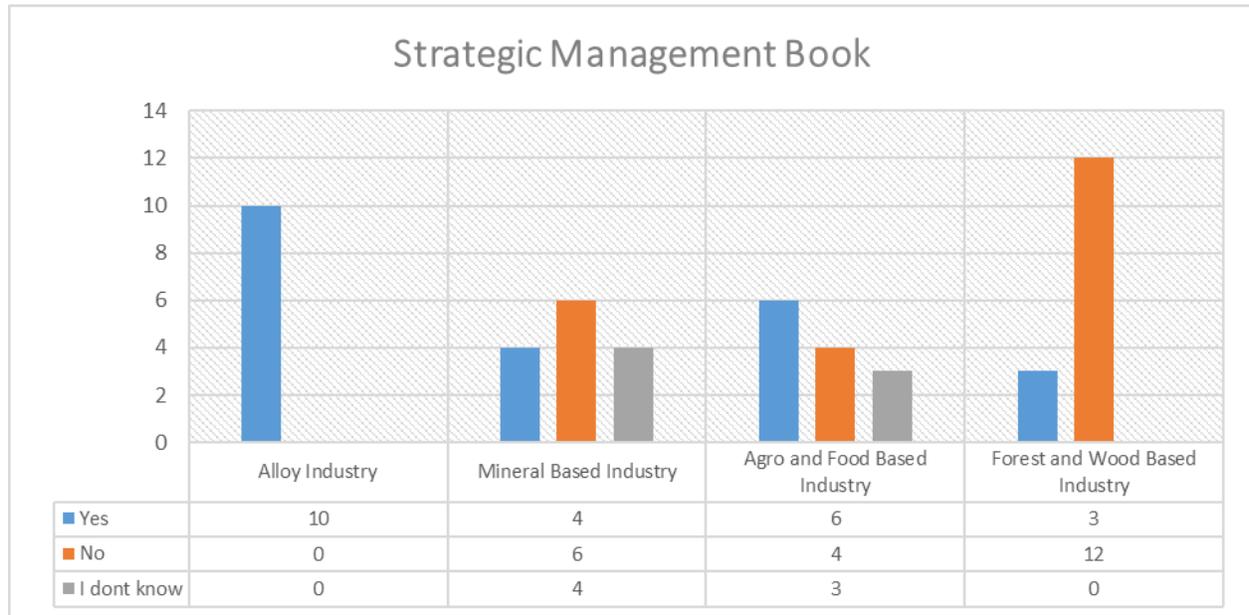


Figure 11: presence of Strategic Management planning document

3.3.1.3 Productivity Measurement System

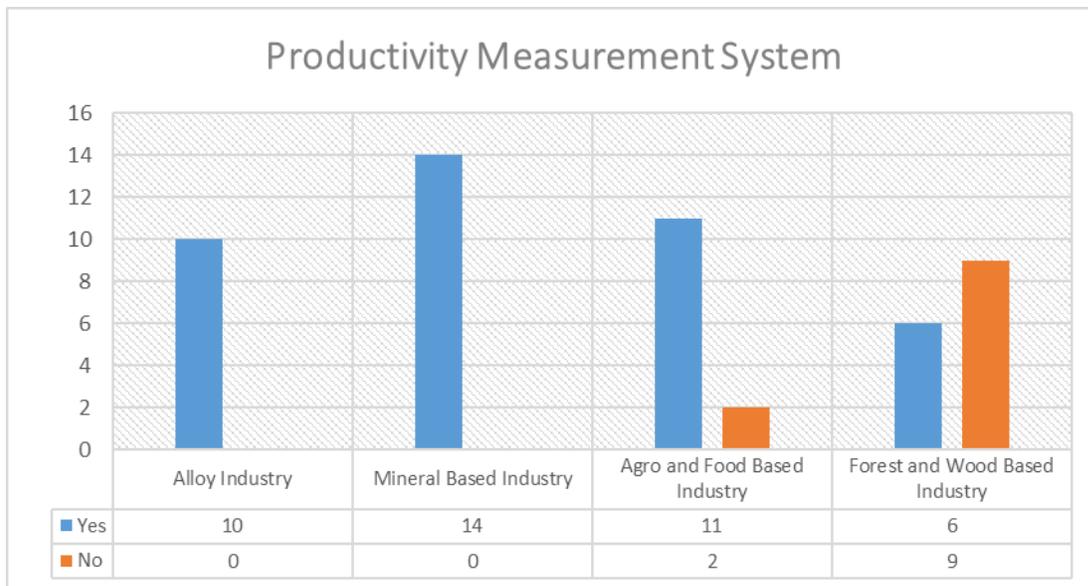


Figure 12: Productivity Measurement System

Strategic planning and management system has long been used as a tool for transforming and revitalizing corporations, government agencies and nonprofit organizations. In the process of this analysis, it was revealed that all the large industry like Alloy Industry have the Strategic Plan intact. As represented in the graph above in figure 10 and 11 all the industries under the Alloy marked positive when asked if the two documents are in place or not.

Furthermore, internal physiological diagnosis to validate and understand the critical factors impacting the industry was also done. Thus, the impact of each factor like Product, Process, People, Policy, External Factors and Leadership were employed to see the impact of each factor in the overall performance of the industry. Findings are presented below from table 6-10 in the Likert scale of 1-5.

Product: Productivity Initiative			
Industry		Index	%
Alloy Based Industry	KRA 1	4.10	82%

Table 6: Process: Productivity Initiative

Process: Productivity Initiative			
Industry		Index	
Alloy Based Industry	KRA 2	3.78	76%

Table 7: People: Productivity Initiative

People: Productivity Initiative			
Industry		Index	
Alloy Based Industry	KRA 3	4.13	83%

Table 8: Policy Productivity Initiative

Policy: Productivity Initiative Intact			
Industry		Index	
Alloy Based Industry	KRA 4	3.86	77%

Table 9: Impact of External Market

External Market: Impact of External Market			
Industry		Index	
Alloy Based Industry	KRA 5	4.90	98%

Table 10: Impact of Leadership

Leadership/Entrepreneurship: Impact on Productivity			
Industry		Index	
Alloy Based Industry	KRA 6	4.50	90%

The Key Productivity Initiatives practiced in the organization clearly show that Alloy

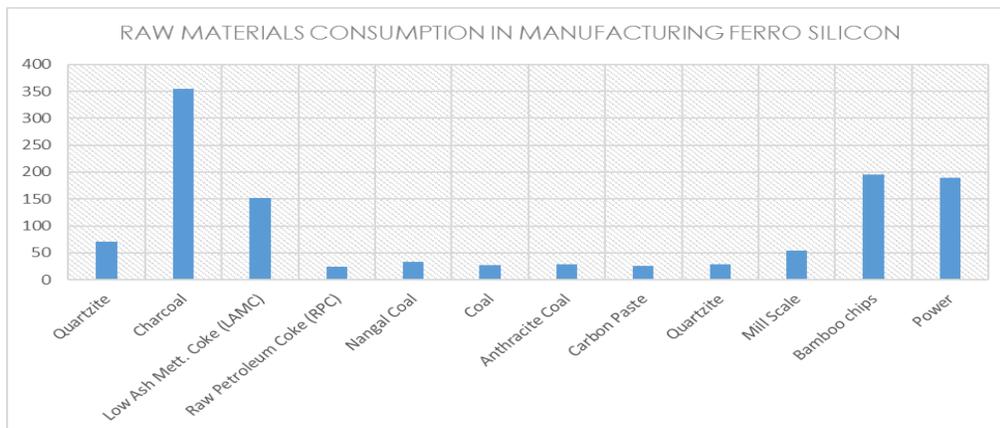
Industry in Bhutan maintains a high level of Product Productivity Initiatives (4.10 in the scale of 5), Process Productivity initiatives (3.78 in the scale of 5), People Productivity Initiatives (4.13 in the scale of 5), Policy Productivity Initiatives (3.86 in the scale of 5), Leadership/Entrepreneurship Productivity Practiced (4.5 in the scale of 5) and finally the impact of external market on the Business Productivity for the year is 4.90 in the scale of 5. This clearly reveals that 98% of the industry rated that their current problem is of the external in nature rather than that of internal productivity problem as suspected by the Government.

3.3.1.4 The Alloy Industry- Challenges

One of the challenges faced by the industry according to primary data is the transportation costs and the costs of raw materials. While it was beyond the scope of this study as well as a matter of business secret for the industry to open up to the details of the sources of the procurement of the raw materials and transportation logistics. However, the literature like the value chain analysis says that this can be taken care if the different aspects of inbound logistics is taken into consideration.

In addition, out of the ten alloy manufacturing industry, nine industry's current outstanding problem is **lack of demand from the previous vendor** and stiff competition from Chinese Steel industry in the Indian market coupled with cheap supply of Alloy products from Malaysian Ferro Alloys manufacturing giant OM Holdings Limited. Furthermore, erratic change of high voltage power tariff rate has disturbed the Alloy Industry in the country. Currently, almost all the Alloy Industry are seeking to minimize the operational as well as production costs to compete in the regular market in the region. From the findings, it is clear that majority of the raw materials used in manufacturing the products as mentioned in the figure below are mostly Charcoal followed by bamboo chips, power and Low Ash Mett Coke. Except Electricity, all the high consuming raw materials like charcoal, LAMC and bamboo chips are imported from India.

Figure 13: Raw materials used by Alloy Industry



Therefore, in order to sustain the industry at large, after carefully studying the cost sheet of each industry jointly the following action may be taken:

3.3.1.5 Recommendation for the Alloy Industry

To address the current Market Conditions.

Form a multi-sectoral task force inclusive of (Royal Audit Authority, Electricity Board, Bhutan Power Corporations, Ministry, BCCI, ABI, NEC and individual owner(s) of the company) to address the following areas:

- A. Recapture the market share lost to the new entrants through price competition in order to start clearing the stocks and to make profit for at least one year term (Om holdings and similar entrants). Furthermore, provide power subsidy to Alloy Industry for at least one year to the point to which the costs of production become competitive enough to recapture the market lost to the new entrants. The subsidized power tariff for one year used by each industry should be charged as liability in the balance sheet of the industry and loan asset in the BPC balance sheet, and pay the agreed principal amount with interest to BPC on monthly basis after completion of one year.
- B. Minimize the operation costs of the industry including salary and wages to the bare minimum.

Improve the Bargaining Power of the Industry: Raw material Sourcing and Transportation Costs

- C. Industry are advised to **form the consortium** (including Cement Industry where they use Coal and Charcoal etc.) to develop the better bargaining power against the supplier of the raw materials and transporters to gain the benefit of economy of scale on the costs of raw materials and transportations.
- D. After formation of the Alloy Industry Consortium, alternative sources of essential raw materials may be explored both within country and in China and neighboring countries to maximize the power of collective bargaining in purchasing the raw materials. Further, the Alloy Industry should diversify the Alloy products based on the demand of the market.

3.3.1.6 Saint Gobain: A General case of Organizational Resilience

Of the ten firms, one under Alloy (see figure 2) responded as not being influenced by any of the factors. This was an interesting case, and hence a deeper look into the case was done. Upon analysis it was found that Saint Gobain was a particular case of an organization with organizational resilience. *British Standard, BS65000(2014) defines "organizational resilience" as "ability of an organization to anticipate, prepare for, and respond and adapt to incremental change and sudden disruptions in order to survive and prosper." To achieve organizational resilience, an organization should have the ability to anticipate, prepare for, respond and adapt to events – both sudden shocks and gradual change. That means being adaptable, competitive, agile and robust."* Both the survey data and face to face interview revealed that Saint Gobain showed all the characteristics of Organizational resilience. Nine principal characteristics came up from the data. They are listed below:

- ✓ 350 years old multinational company
- ✓ It has been operating in more than 100 countries all over the world
- ✓ The product produced in the factory were consumed by their own factories in

- other countries. Self-sustaining
- ✓ Core Raw materials and technology required by the factory were supplied and supported by other subsidiary companies.
- ✓ Excellent management team and leadership
- ✓ Product and Business Brand they created in the market
- ✓ Products were of high quality and cater the niche market
- ✓ ISO certified company
- ✓ Good planning and transparent management system were some of the competitive edge.

Resilient organizations, according to BS65000(2014) work within a “complex web of interactions”. It is further stressed by the standard that it is important to build “resilience not only within an organization but across networks and in partnership with others.” Saint Gobain, worked with in a complex web of interaction with their international and national stakeholders. Being a multi- national company, their empowerment was in being aware of their situation, risks, vulnerabilities and current capabilities to deal with them, and being able to make informed tactical and strategic decisions. Leadership and management was reflected as “being good” and was indicated by the respondents responding “yes” for good management and leadership and “transparent system of doing business”.

Of all the industry under study, it is important to learn from Saint Gobain in many areas. Though each of the industry and its product may vary, the importance is in learning about the overall management and business strategy that is employed by Saint Gobain that makes it a resilient industry. Hence Saint Gobain is not just an example of a good case to just the Alloy Industry, but for all the industry. Some additional strategies in addition to the above points highlighted are:

- Diversification of products
- Constant market study and development of marketing tactics
- Development of right human resources and team work
- Risk mitigation strategy in place
- Creation of brand equity and popularity.

Thus, all of the other industry does have great reason to learn a lesson from the business management strategy of the Saint Gobain to avoid future business shocks.

3.3.1.7 Conclusion:

In conclusion, even though 9 out of 10 alloy industry suffer from external factors like poor market demand, coupled with lack of market information and high costs of transportation, internal factors like its management and productivity measurement system had been in place as revealed through the productivity index (see annexure 9). It was also evident from the data that the Alloy industry maintain a high level of Product, Process, People and Policy productivity in the organization. Evidences drawn from secondary and primary data also reveal that the profit margin for each industry for the last seven years as extremely high. The high profit margin is directly dependent on primary and support activities of the Industry (Porter, 1998). Furthermore, it was clearly evident from the primary

data that the factors affecting the performance of the Industry was chiefly due to external factors as stated above. The existing influence of external market trend is good news, as globally, the profitability and productivity trend line clearly show the positive trend of growth and development of the industry in the years to come. Trend analysis show that the Alloy Industry will pick up in future and this is confirmed by international trend report (see figure 4 above) that shows the increasing trend in steel consumption ratio and production of the crude steel. Therefore, it can be safely said that the current downward profitability trend is purely due to the overheating of the market and therefore is cyclical and temporary in nature.

3.3.2 Agro and Food Based Industry including Alcohol and Beverages

Agro and Food Based industry including Alcohol and Beverages are regionally improving the scenario. Investors are into positive mood and it is projected to grow at the rate of 104 per cent, touching US\$ 482 billion by 2020 (<http://www.ibef.org/industry/indian-food-industry.aspx#sthash.fJIRzxWm.dpuf>), according to (Indian Brand Equity Foundation, 2016). Therefore, Bhutan has an equal opportunity for the FDI food processing industry's growth and investment.

This section explores the factors affecting the profitability and productivity of the Agro and Food Based Industry including Alcohol and Beverages. As reflected in the figure 2 above, out of 13 industry, 8 industry (mostly alcohol, beverages (Beer and soft drinks) and Mineral Water Manufacturers) expressed positively that they do not have problem in the conduct of the business so far. 5 industry mostly manufacturer of animal feeds, flour, food and fruits products were some of the industry, which expressed their concern on short supply of raw materials, lack of marketing information, human resources and poor market conditions as shown in the table 11 below:

Table 11 Factors Affecting the Agro-Food Based Industry:

2	Agro and Food Based Industry including Alcohol and Beverages	Total Industry									
		Severity									
	Factors Identified the deterioring	NO: 1	NO:2	NO:3	NO:4	NO:5	NO:6	NO:7	NO:8	NO:9	NO:10
a	Human Resources		1				1				1
b	Obsolete Technology								1		
c	Leadership									1	
d	Management System		1								
e	Raw Material Sourcing (Uneconomic & Unreliable)	4									
f	Poor Market Conditions (External)		1	1							
g	Sales & Marketing Management System (Lack of information)				1						
h	Inefficient Energy Supply (Focus on Price)							1			
i	Poor Quality of the Products					1					
j	Any other reasons		1								1

3.3.2 .1 Value Chain and Productivity Analysis of the Industry

It is important to know the level of competitive edge of each industry to compete in the market. One of the CEOs of the company said “ Give us the raw material, we will provide employment, revenue and quality products to the country. For our products market is not at all a problem.” Considering the information provided 85% of the respondents responded that their internal management process and productivity measurement systems are in place and certified by International Standards Organization (ISO). Furthermore, indexes of the Product, Process, People and Internal Policy Productivity Initiatives/practices practiced by the industry are high when measured in the **Likert Scale of 5** as reflected in the table below.

Table 12: Product: Productivity Initiative

Product: Productivity Initiative			
Industry		Index	%
Agro and Food Including Alcohol and Beverages	KRA 1	3.57	71%

Table 13: Process: Productivity Initiative

Process: Productivity Initiative			
Industry		Index	
Agro and Food Including Alcohol and Beverages	KRA 2	3.98	80%

Table 14: People: Productivity Initiative

People: Productivity Initiative			
Industry		Index	
Agro and Food Including Alcohol and Beverages	KRA 3	4.25	85%

Table 15: Policy Productivity Initiative

Policy: Productivity Initiative Intact			
Industry		Index	
Agro and Food Including Alcohol and Beverages	KRA 4	4.11	82%

Agro and Food Based industry scored 4.12 in the scale of 5 under Product Initiative, 3.98 under process, 4.85 under people and 4.19 in internal policy related practices in the organization. Which means, 82% of the industry practices the Product Productivity process, 80% of the Industry practices the Process relevant to the Industry, 97% on people related initiatives and 84% of the industry practices the ISO standard internal policy in the organization to make their product competitive and sustainable.

However, when it comes to the nature of factors affecting the Agro and Food Based Industry, it is clear from the indices below that majority of the problem is of external in nature rather than internal as reflected in the table below. 92% of the industry feels that their nature of current problem faced by the Industry are of external in nature like lack of raw material sources, constant increase in raw material prices, high transportation costs, coupled with policy restrictions on employment of foreign workers in the country, limit on release of foreign currency when required most and 40% value additions on the raw materials imported from other countries.

Table 16: Impact of External Market Index

External Market: Impact of External Market			
Industry		Index	
Agro and Food Including Alcohol and Beverages	KRA 5	3.83	77%

Finally, the study looked at the impact of entrepreneurship/ leadership on the productivity and the performance of the Industry. It is revealed that 80% of the current performance of the industry is fuelled by the leadership of the top management in the industry. Therefore, the information revealed in the table 11 matches with the information collected under six Key Result Areas (KRA) reflected in the tables.

Table 17: Impact of Leadership in the Industry

Leadership/Entrepreneurship: Impact on Productivity			
Industry		Index	
Agro and Food Including Alcohol and Beverages	KRA 6	4.00	80%

3.3.2.2 Profitability, Productivity and Sustainability of the Industry (Trend Analysis)

Keeping in view of the constraints mentioned above, the study also looked at the historical data to study the trend of business sustainability vis-à-vis and standard factors of production productivity data as depicted in the figure 16 (Factors of Production Productivity Trend line), Profitability trend line figure 14 and Labour Productivity trend line Figure 15 below:

Figure 14: Profitability trend line for FAABI

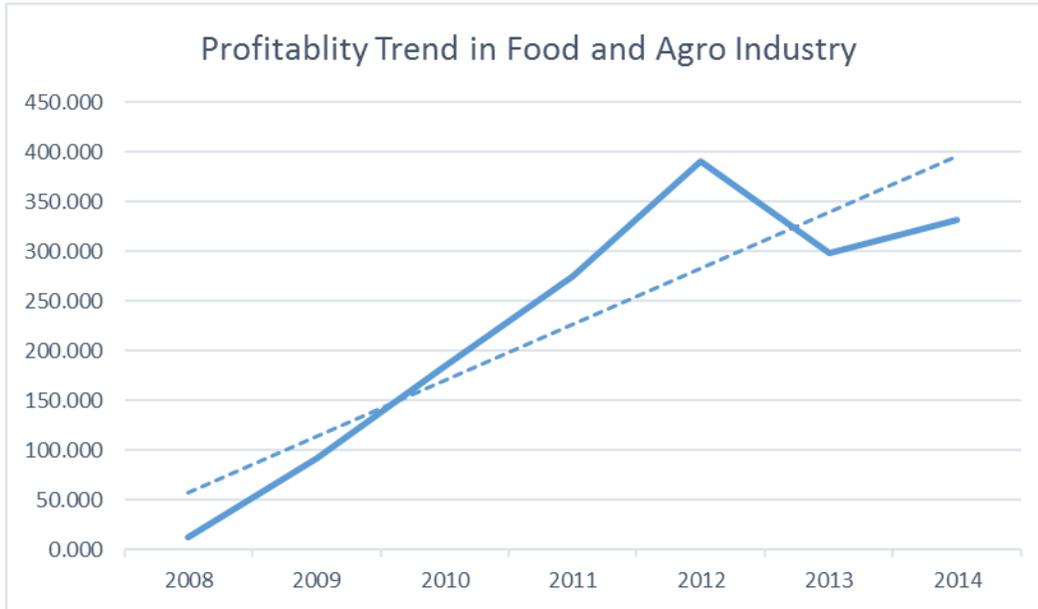


Figure 15: Labor Productivity Trend for FAABI

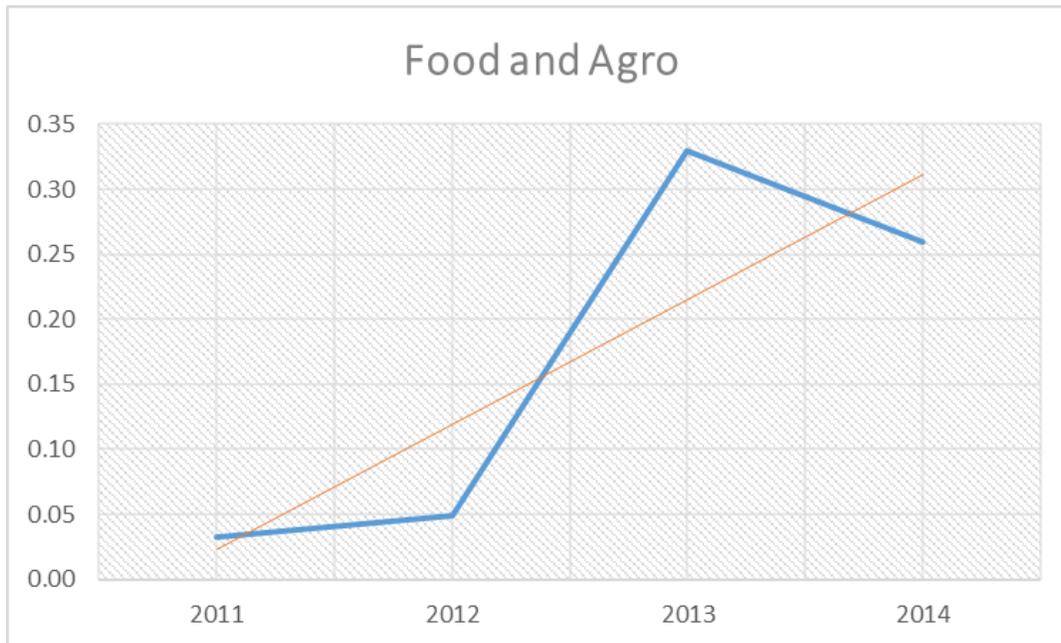
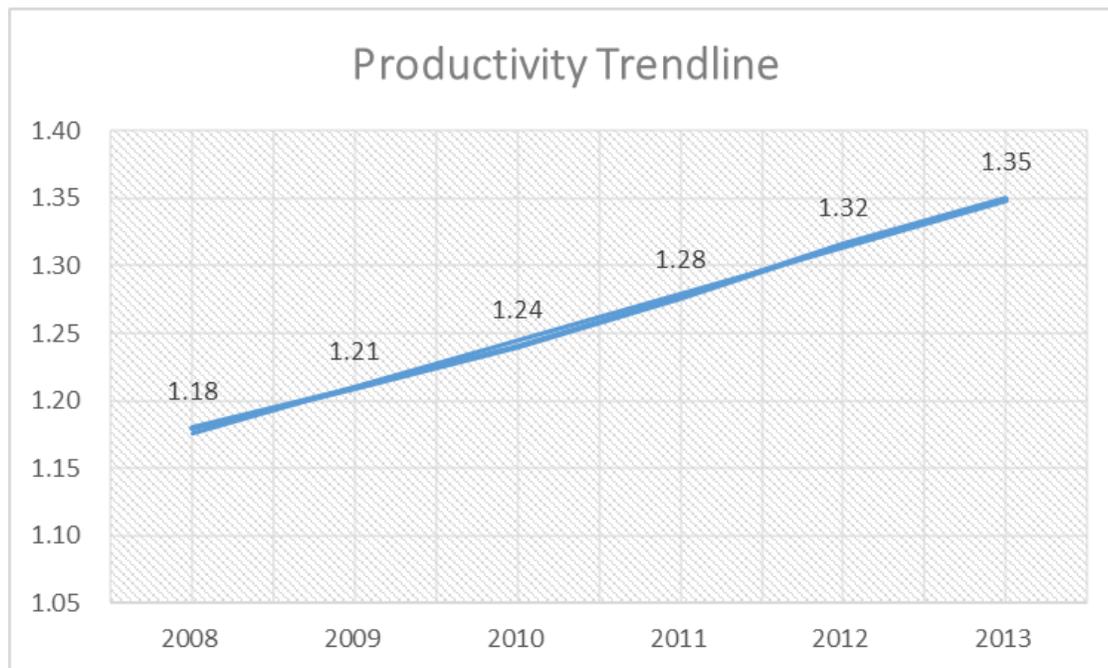


Figure 16: Factors of Production Productivity trend line (APO)



Both the figures above clearly show that there is strong correlation between the profitability and the productivity trend line. The slope of the trend line is positively increasing which shows that the profitability of the industry will be increased by increasing the productivity of the factors of production.

3.3.2.3 Inter Industry Performance Comparison:

8 of the 13 firms under this sector (as stated in the figure 3) were not impacted the business both by internal as well as external economic factors, while 5 other industries were grappling with the short supply of raw materials, high transportation costs, lack of market information and erratic electricity tariff. As shown in the **Annexure 8**, that those firms coping up with their business risks despite the global economic crisis were because of:

- ✓ Availability of the market for the produce
- ✓ Excellent management team and leadership
- ✓ Product and Business Brand they created in the market
- ✓ Products were of high quality
- ✓ Good Leadership and Management,
- ✓ Availability of raw materials in Bhutan (Water) were some of the reasons why these industry were able to mitigate their business risks and sustain in the industry.

3.3.2.4 Specific recommendation: Agro and Food Industry including Alcohol and Beverages

The most important factor deterring the growth and development of the Agro, Alcohol, Beverages and Food industry as reflected in the findings are (1) unavailability of readymade raw materials within the country, (2) Since Raw materials are not available in the country, the industry is presently importing a vast majority of the raw materials like corn, wheat, barley, mustard cake, fruit pulps etc from India and -others from other countries. In the short run, none of the industry are bankrupt but earning decent profit to sustain itself in the market. However, in long run, to depend on other countries to supply the core raw materials to the industry would be risky. With the change of political and socio-economic scenario in the regional or global market, there is a high risk of direct impact on the business performance of the industry. Therefore, the following recommendations are suggested:

- A. In the long run, Department of Industry in association with the partner Industry must explore the possibilities of self-production of the raw materials. In addition, Government must set target and start commercial farming under Public Private Partnership (PPP) model *consistently* to meet the demand of the industry.
- B. Considering the availability of best mineral water base in Bhutan, water and beverages manufacturing industry must set the brand popularity using Brand Bhutan to sale the products in the region at the cheaper rate but in higher volume.

3.3.2.5 Conclusion:

In conclusion, the study revealed that on an average 80% of the Agro and Food Based Industry including Alcohol and Beverage maintains its productivity level to make their products more competitive and sustain in the market as indicated in the indices above. Furthermore, readily available market for the manufactured produce, coupled with available raw materials (particularly for the water and beverages) were some of the positive factors contributing to the industry. However, food, flour, fruits and feeds manufacturing industries faced challenges of irregular supply of raw materials, 40% value addition on imported raw materials, high transportation costs on import of raw materials. But with regard to profitability, productivity and sustainability of the industry, the trend analysis clearly showed that the industry has positive growth potential if government and the Association of Bhutanese Industries (ABI) collaborate and cooperate with each other in the process of the growth and development of these industry in a proactive manner rather than waiting for the problem to occur and then look for solution.

3.3.3. Forest and Wood Based Industry

This section explores the factors affecting the profitability and productivity of the Forest and Wood Based Industry. As reflected in the **figure 3** above, out of 15 firms, 4 expressed positively that they do not have problem in the conduct of the business so far. However, 11 firms mostly furniture manufacturing units, expressed their concern on short supply of raw materials, human resources, poor market conditions and threat from the import of furniture from the neighbouring countries which were some of the factors deterring and threatening the growth and development of the industry as shown in the table 18 below:

3	Forests and Wood Based Industry	Total Industry									
		Severity									
	Factors Identified the deterining	NO: 1	NO:2	NO:3	NO:4	NO:5	NO:6	NO:7	NO:8	NO:9	NO:10
a	Human Resources		1			1					6
b	Obsolete Technology		1								
c	Leadership						1				
d	Management System								1		
e	Raw Material Sourcing (Uneconomic & Unreliable)	2	1								
f	Poor Market Conditions (External)	2	1			2					
g	Sales & Marketing Management System (Lack of information)										1
h	Inefficient Energy Supply (Focus on Price)			1							
i	Poor Quality of the Products							1			
j	Any other reasons				1						

Table 18: Factors Affecting Forests and Wood Based Industry

3.3.3.1 Value Chain and Productivity Analysis of the Industry

It is important to know the level of competitive edge of each industry to compete in the market. Considering the information provided in the figure 15 and 16 above 80% of the Forest and Wood Based Industry do not have their written strategic plan and 60% don't have Productivity Measurement System in place to maintain and monitor the Proficiency and Productivity of the Industry. It is mainly due to the fact that 8 firms included in the sample survey study were small and cottage industry, due to which the information is skewed. Furthermore, indexes of the Product, Process, People and Internal Policy Productivity Initiatives/practices practiced by the industry shows that when measured in the **Likert Scale of 5**, the scores are competitive to other Large and Medium Industry as reflected in the table below:

Table 19: Product: Productivity Initiative

Product: Productivity Initiative			
Industry	KRA 1	Index	%
Forests and Wood Based Industry		3.94	79%

Table 20: Process: Productivity Initiative

Process: Productivity Initiative			
Industry	KRA 2	Index	
Forests and Wood Based Industry			4.05

Table 21: People: Productivity Initiative

People: Productivity Initiative			
Industry	KRA 3	Index	
Forests and Wood Based Industry			4.09

Table 22: Policy Productivity Initiative

Policy: Productivity Initiative Intact			
Industry	KRA 4	Index	
Forests and Wood Based Industry			3.94

The industry scored 3.97 in the scale of 5 under Product Initiative, 4.05 under process, 4.09 under people and 3.94 in internal policy related practices in the organization. Which means, 79% of the industry practices the Product Productivity process, 81% of the Industry practices the Process relevant to the Industry, 82% on people related initiatives and 79% of the industry practices the standard internal policy in the organization to make their product competitive and sustainable.

However, when it comes to the nature of factors affecting the Forest and Wood Based Industry, it is clear from the indices below that majority of the problem is of external in nature rather than internal. 76% of the firms feel that their nature of current problem are of external in nature, especially threats from the supply of wood based products from China and neighbouring countries, construction materials substituted by much durable and readymade iron, steel or concretes. It is further aggravated by lack of available quality raw materials within the country, constant increase of the raw material prices, high transportation costs, coupled with policy restrictions on employment of foreign workers in the country were some of the visible threats to the industry as reflected in the table below.

Table 23: Impact of External Market Index

External Market: Impact of External Market			
Industry	KRA 5	Index	
Forests and Wood Based Industry			3.80

The study also looked at the impact of Entrepreneurship/ Leadership on the productivity, product innovations and the performance of the Industry. It was revealed that 79% of the current performance of the industry is impacted by the leadership of the top management in the industry. Therefore, the information revealed in table 6 matches with the information collected under six Key Result Areas (KRA) reflected in table 19-24.

Table 24: Impact of Leadership in the Industry

Leadership/Entrepreneurship: Impact on Productivity			
Industry	KRA 6	Index	
Forests and Wood Based Industry		3.97	79%

3.3.3.2 Profitability, Productivity and Sustainability of the Industry (Trend Analysis)

Keeping in view of the constraints mentioned above, the study also looked at the historical data to study the trend of business sustainability vis-à-vis standard factors of production productivity data as depicted in the **figure 19** (Productivity Trend line) Profitability figure 17 and Labour Productivity trend line 18 below:

Figure 17: Profitability Trends (2008-2014)

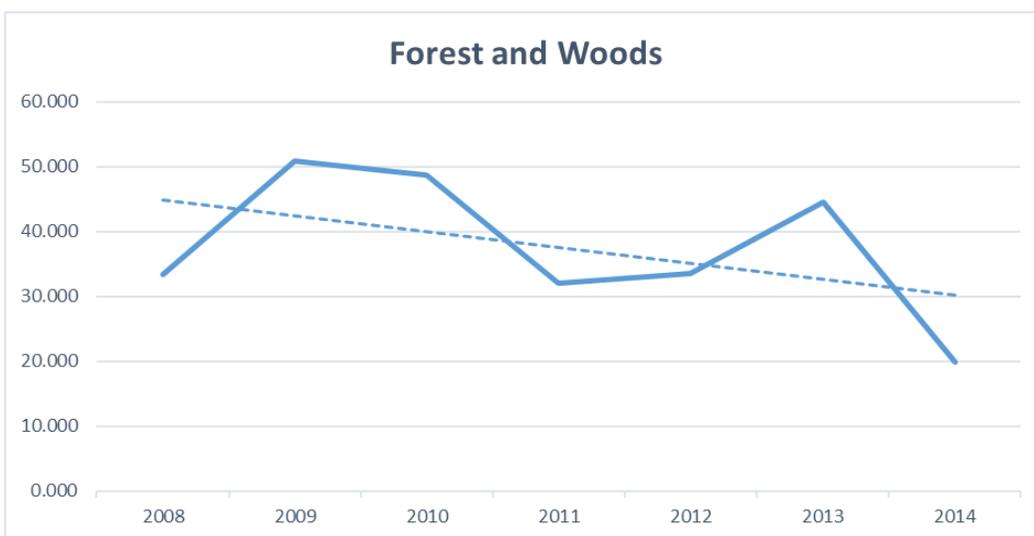


Figure 18: Labor Productivity Trend line for WBI

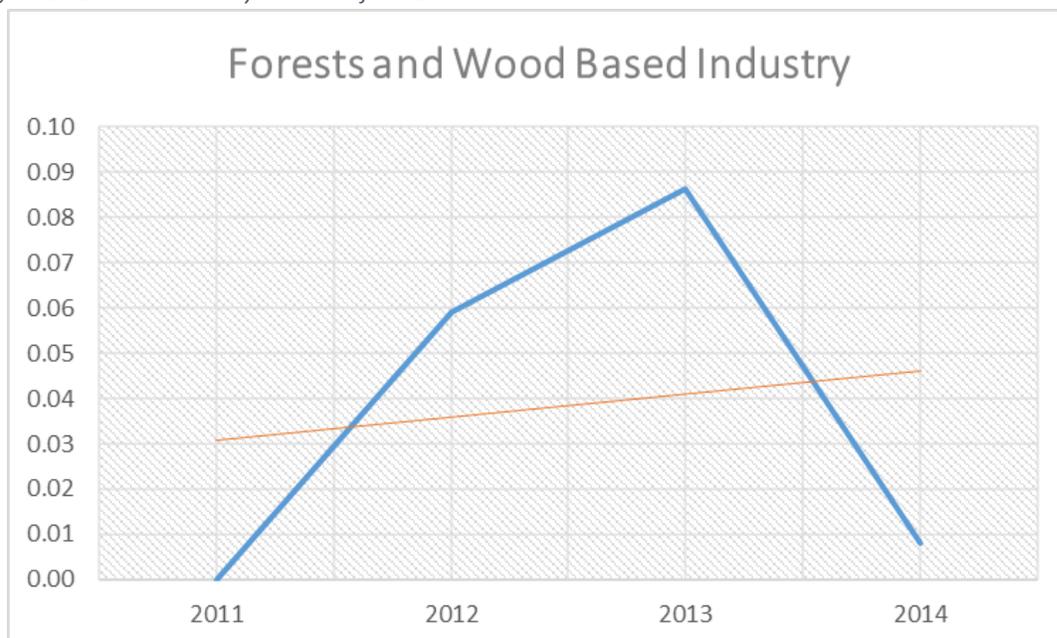
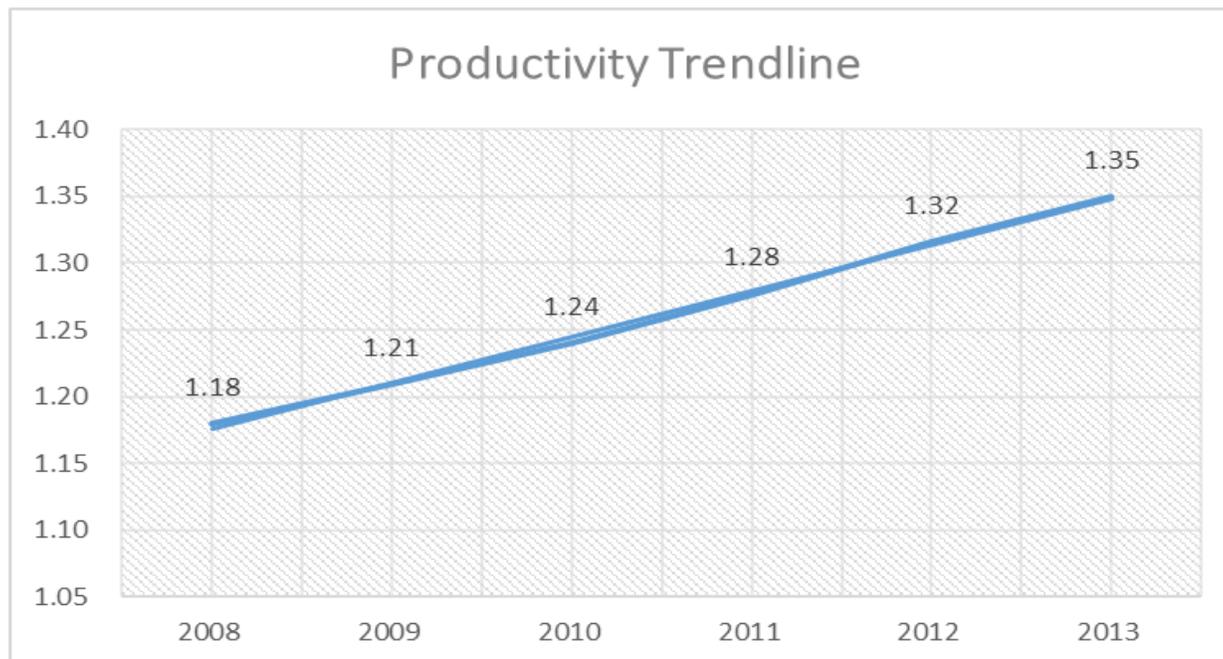


Figure 19: Factors of Production Productivity trend line for Wood Based Industry



Though the information shown in the figure above do suffer from available financial data but the reality of the industry and the figure do match to some extent. The slope of the profitability trend line is negatively declining. It clearly shows that the industry is at the declining business cycle. However, the slope of the trend is not sharp, indicating that profitability of the Industry would be declining further.

3.3.3.3 Inter Industry Performance Comparison:

4 of the 15 firms (as stated in the figure 3) had not been impacted by both the internal as well as external economic factors, while 11 other firms stated that they were grappling with the short supply of raw materials, and lack of market information. Most of the firms also did not have a clear cut strategic documents in place. Only one Government owned ply board and furniture making unit is exporting its wood products in the neighboring country, while the rest are not able to compete with the Indian wood and furniture manufacturing industry. The paradox is when Bhutanese Wood Based Industry are complaining about market, raw materials, labor and competition from the neighboring country like china and India, Vietnamese company like Aduka Pvt. Ltd. has come into Bhutan and created and captured the high end market in Bhutan and is running successfully. Furthermore, the FDI wood based company has clearly mentioned on enquiry that they do not have any issues either in market, labor, productivity or finances. Primary data revealed that Aduka Pvt. Ltd. had good leadership and entrepreneurship practices. Amongst others the industry also benefited from the following factors:

- ✓ Availability of the growth of the niche market,
- ✓ Use of latest technology,

- ✓ Skilled labour,
- ✓ Products were of high quality,
- ✓ Good Leadership and Management were some of the reasons why these firms were able to mitigate their business risks and sustain in the industry.

In the regional market, the Prime Minister of India, Mr Narendra Modi, has launched the 'Make in India' initiative to place India in the world map as a manufacturing hub and give global recognition to the Indian economy. The Government of India has set an ambitious target of increasing the contribution of manufacturing output to 25 per cent of Gross Domestic Product (GDP) by 2025, from the current 16 per cent. Due to such great influence, Swedish home furnishing brand Ikea has made a long-term plan of opening 25 stores in India by making an investment worth Rs12,500 crore (US\$1.9 billion). (<http://www.ibef.org/industry/manufacturing-sector-india.aspx#sthash.9dqjJFaa.dpuf>). Furthermore, in order to push the Indian government's initiative of 'Make in India' to the global level, Mr Narendra Modi, pitched India as a manufacturing destination at the World International Fair in Germany's Hannover earlier this year in 2016. Mr Modi showcased India as a business friendly destination to attract foreign businesses to invest and manufacture in the country. India is also planning to locally manufacture food products as many as 181 products and sell around the world. Therefore, these regional trends can greatly benefit Bhutan and its forest and wood based industry.

3.3.3.4 Recommendation and conclusion:

The study revealed that on an average 79% of the Forest and Wood Based Industry maintains its productivity level to make their products more competitive and sustain in the market as indicated in the indices above. However, the profitability trend line for last 8 years is in declining mode even when productivity trend line of the factors of production is moving positively upward at the constant rate. As indicated in the table 14, the industries do suffer from getting skilled labourers to produce quality products to compete with the products imported from China and other neighbouring countries. In one of the key informant interviews, it was also revealed that substitute products are competing with the other wood based products both in the construction industry as well as in the manufacturing industry. Furthermore, non-availability of the raw materials, lack of regional market information for the manufactured goods were some of the factors negatively impacting the growth and development of the industry. In order to improve the profitability, productivity and sustainability of the industry, government and the industry association must collaborate and cooperate each other in the following areas.

- A. Develop the Business Birth Card (BBC) data base for each of the forthcoming, existing, and the past industry. Each Industry being monitored based on the four Business domains: (1) Potential Entrants, (2) Bargaining power of buyers (Demand), (3) Bargaining Power of Suppliers and (4) Substitutes.
- B. Government, in association with the Industry Association must establish a common professional marketing and Supply Chain agency to promote and sale the products of the Industry to various target market both within and outside the country. The resources

must be pooled from all the industry and some operational costs may be borne by the Government, which would be charged in the products and recovered from the revenue.

- C. Exploration into online linkages with international online giants like Allibaba.com and other regional B2B or B2C seller can be initiated by the Industry Association to buy and sell the products online. The online payment gateway must be made user friendly, secured and trustworthy.

3.3.4 Mineral Based Industry Analysis

Globally, demand for cement and associated products like Plaster of Paris etc. have seen an upward trend. More than one trillion dollar worth of investment in the infrastructure in India itself has drawn and run the mega cement manufacturing industry in the state of Andra Pradesh, Tamil Nadu, Kerala and Rajasthan to higher selling ground (Indian Brand Equity Foundation, 2016). However, India by the virtue of its vastness, and geographical locations, supply of required raw materials is not a big issue. Efficient mining technology and economic transportations system and cheap availability of the labor have greatly contributed in the profit margin of the industry. In Bhutan, however, the picture is not as good.

This section explores the factors affecting the profitability and productivity of the Mineral Based Industry. As reflected in the **figure 3** above, out of 14 firms, 6 expressed positively that they do not have problem in the conduct of the business so far. These six constitutes the manufacturer of the Putty, Plaster of Paris and the Concrete bricks manufacturing units. However, the 4 cement manufacturing units, excluding Dungsam and 3 Marble, Lime stone and Carbide manufacturing units suffer from lack of raw materials, constant increase of the electricity tariff, poor market information system as shown in the table 25 below:

Table 25: Factors Affecting Mineral Based Industry

4	Mineral Based Industry	Total Industry									
		Severity									
	Factors Identified the deterioring	NO: 1	NO:2	NO:3	NO:4	NO:5	NO:6	NO:7	NO:8	NO:9	NO:10
a	Human Resources										
b	Obsolete Technology										
c	Leadership										
d	Management System										
e	Raw Material Sourcing (Uneconomic & Unreliable)	4									
f	Poor Market Conditions (External)		1						3		
g	Sales & Marketing Management System (Lack of information)		1							1	
h	Inefficient Energy Supply (Focus on Price)				5						
i	Poor Quality of the Products										
j	Any other reasons										

3.3.4.1 Value Chain and Productivity Analysis of the Industry

It is important to know the level of competitive edge of each industry to compete in the market. Considering the information provided in the figure 11 and 12 above 42% of the Mineral Based Industry do not have their written strategic plan and 29% of the industry responded that they do not know about the availability of such document, whereas only 29% had the document. Furthermore, all the mineral based firms maintained the productivity measurement system to maintain and monitor the Proficiency and Productivity of the Industry. Moreover the indexes of the Product, Process, People and Internal Policy Productivity Initiatives/practices practiced by the industry shows that when measured in the **Likert Scale of 5**, Mineral Based Industry do implement the Product, Process, People and Policy initiatives laid down in the questionnaire as reflected in the table below:

Table 26: Product: Productivity Initiative

Product: Productivity Initiative			
Industry	KRA 1	Index	%
Mineral Based Industry		4.21	84%

Table 27: Process: Productivity Initiative

Process: Productivity Initiative			
Industry	KRA 2	Index	
Mineral Based Industry		3.63	73%

Table 28: People: Productivity Initiative

People: Productivity Initiative			
Industry	KRA 3	Index	
Mineral Based Industry		4.16	83%

Table 29: Policy Productivity Initiative

Policy: Productivity Initiative Intact			
Industry	KRA 4	Index	
Mineral Based Industry		4.07	81%

The industry scored 4.21 in the scale of 5 under Product Initiative, 3.63 under process, 4.16 under people and 4.07 in internal policy related practices in the organization. Which means, 84% of the industry practices the Product Productivity process, 73% of the Industry practices the Process relevant to the Industry, 83% on people related initiatives and 81% of the industry practices the standard internal policy in the organization to make their product competitive and sustainable.

Table 30: Impact of External Market Index

External Market: Impact of External Market			
Industry	KRA 5	Index	
Mineral Based Industry		3.88	78%

However, when it comes to the nature of factors affecting the Mineral Based Industry, it is clear from the indices below that majority of the problem are of external in nature rather than internal as reflected in the table below. 78% of the industry feels that their nature of current problem faced by the Industry are of external in nature like especially sourcing the raw materials and constant increase of the electricity tariff by the government is seen as the biggest challenge to the mineral based industry, particularly to the cement industry. During the focus group discussion, the stakeholders clearly mentioned that the cement and other mineral based do not have much problem with regard to market, but the biggest problem so far faced is the raw materials coupled with transportation risks and the costs were some of the visible threats to the industry as reflected in the table below.

The study also looked at the impact of Entrepreneurship/ Leadership on the productivity, product innovations and the performance of the Industry. It is revealed that 84% of the current performance of the industry is driven by the Leadership of the top management in the industry. Therefore, the information revealed in the table 6 matches with the information collected under six Key Result Areas (KRA) reflected in the tables.

Table 31: Impact of Leadership in the Industry

Leadership/Entrepreneurship: Impact on Productivity			
Industry	KRA 6	Index	
Mineral Based Industry		4.18	84%

3.3.4.2 Profitability, Productivity and Sustainability of the Industry (Trend Analysis)

Keeping in view of the constraints mentioned above, the study also looked at the historical data to study the trend of business sustainability visa viz to standard factors of production productivity data as depicted in the figure 22 (Productivity Trend line) Profitability figure 20 and labour productivity trend line 21 (figure 21 not available) below:

Figure 20: Profitability Trend line for Mineral Based Industry

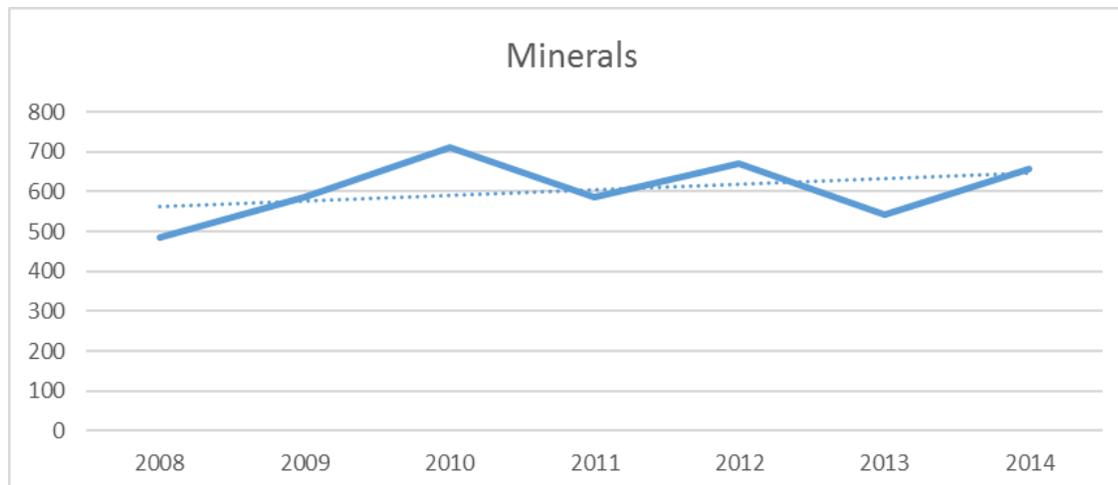
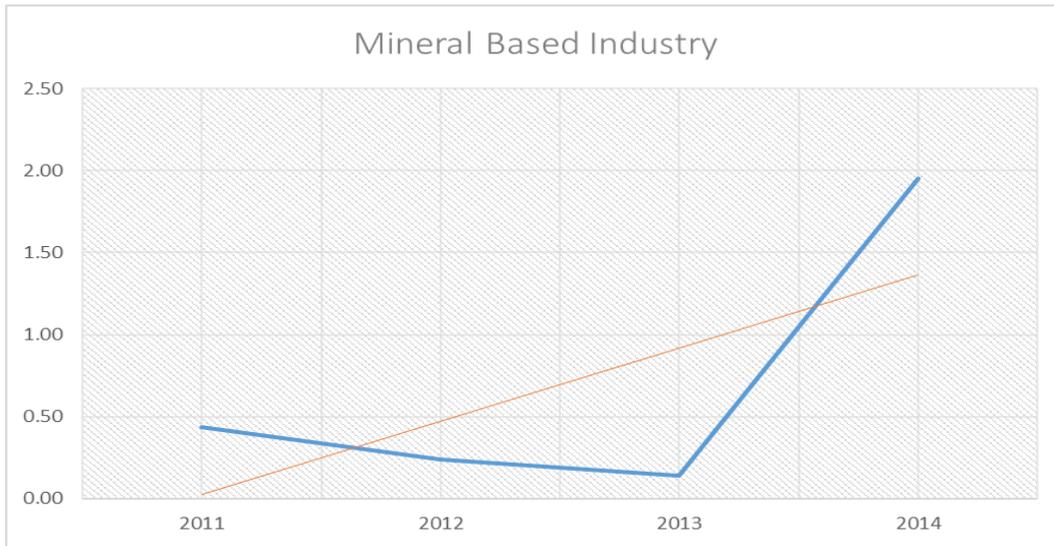
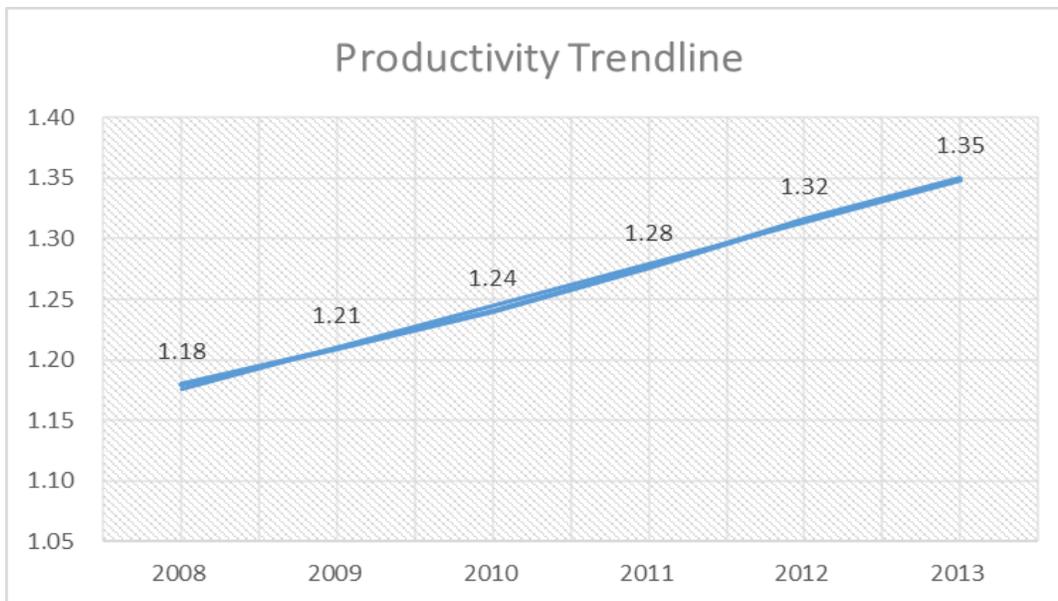


Figure 21: Labor Productivity of Mineral Based Industry



Though the information shown in the figure is collected from available financial data the reality of the industry and the figure do match to some extent. The slope of the profitability trend line is almost parallel to the X axis, indicating that the profitability level of the Mineral based industry is almost saturated. The rate of growth of the industry is very slow and to the minimal.

Figure 22: Factors of Production Productivity trend line



3.3.4.3 Inter Industry Performance Comparison:

While 6 out of the 14 firms (as stated in the figure 3) were not impacted both by internal as well as external economic factors, the other 8 firms were grappling with the short supply of raw materials, high transportation costs, lack of market information and erratic electricity tariff. As show in the **Annexure 8**, that those industry coping up with their business risks despite of the global economic crisis were because of the following factors in place:

- ✓ Availability of the market both within and outside the country,
- ✓ Excellent management team and leadership,
- ✓ Cheap raw material especially the Kerosene Subsidy from the Government,
- ✓ Products were of high quality,
- ✓ Good Leadership and Management, were some of the reasons why these industry were able to mitigate their business risks and sustain in the industry.

Hence the study gives the following recommendation to solve existing problems.

3.3.4.4 Conclusion and Specific recommendation of the Mineral Industry

The study showed that majority of the industry (8 out of 14) suffers mostly due to non-availability of the primary raw materials to manufacture the core raw materials (clinker), high transportation costs and risks, followed by the increase in electricity tariff yearly. Despite of these challenges, industry's profitability rate of growth is mild and positively increasing parallel with the factors of production's Productivity index as mentioned above. The Industry association and the government should collaborate and cooperate with each other in order to improve the profitability, productivity and sustainability of the industry.

Under the category of Mineral Based industry, there are two types of industry categorized together, (1) Cement Manufacturing Industry, and (2) Industry Manufacturing Plaster of Paris. With regard to the industry manufacturing Plaster of Paris, they do not have any issues both in manufacturing as well as selling the products either in Bhutan or in India. Moreover, the factory is running at the optimum level of its operation.

However, with regard to cement industry based in Gomtu, Samtse and Chhukha both medium and large industry complained about the lack of raw materials, especially the lime stone to make **clinker**. Currently shortage of raw materials are met from the import of readymade clinker and compressed fly ash imported from India. Therefore, many of the cement intensive construction industry like PHP I & II, Mangdechu Project etc. consume large quantity of the cement and the factories are finding very difficult to cope up with their demand. But with regard to Dungsam Cement Industry, KI and the questionnaire clearly stated that Dungsam neither has management issue, nor market or raw materials. The industry is in the process to recoup the earlier capital investment.

Therefore, for the Mineral based industry, it is recommended that lucrative land replacement compensation plan should be designed for acquiring private as well as Government land for query through Property Acquisition and Valuation Agency (PAVA). **Prior to such initiative, proper long term cost benefit analysis may be conducted by the agency between the environmental impact and the impact of**

closing down the industry due to lack of raw materials to sustain its production.

Moreover, with the plan of 1 trillion rupees worth of infrastructure development in India, Bhutan can reap the benefit of it with the sale of the Cement at much cheaper rate than Indian cement. In addition, cement made in Bhutan are much cheaper and of better quality than their Indian counterpart. Hence, the revenue earned from such initiatives can be ploughed back for environmental protection, conservation and preservation plan.

It is also recommended that the mineral base industry can form a consortium with related industries (e.g. Alloy) using the same raw materials (Charcoal) to have an advantage of economy of scale in purchase of raw materials and an advantage in transportation cost.

CHAPTER IV: LESSON LEARNED FROM THE STUDY

Based on data findings, field observation, and discussion with different international best practices, this section of the study presents lessons learned. The section will therefore supplement, support and justify the conclusion and recommendation provided by the study.

4.1 Lesson Learned

1. The study focused on four sectors of industries under the Department of Industry. Given a timely support and an informed guidance by the government and a positive and proactive outlook of the industries, most of the findings suggest a positive trend towards better productivity and growth of the industry in future.
2. In the course of the study it was found that several of the important strategic documents which should form the guidelines for the industries' mission and action were found missing. Hence, one of the most important lessons from this study is the maintenance and transparency of up to date information and records of each industry under the Department. This would lead to addressing or resolving issues by referring to the available archive data any time. While it is understandable that each of these business houses would have their own business secrets that they would not want to share, the maintenance and transparency of some basic documents like financial statements, human resource information and cost sheets would help any industry in making strategic decision as well as dispel miscommunication and compartmentalization in the industry which would otherwise result in impacting the industry adversely. Further, the availability of these documents can help the government to take an informed decision on any matters as and when needed. This is further discussed in the recommendation section.
3. In continuation to the above point, the development of **Business Flood Warning Systems** is also seen as highly important. This system can be a platform where the Government, Financial Institutions in collaboration with Association of the Bhutanese Industry (ABI) and Bhutan Chamber of Commerce (BCCI) can meet to share relevant and monitored information to act proactively towards any kind of emergencies linked to business and industry. Discussion and follow-up on important issues such as business flood warning system can garner discussions to move the industry towards being resilient.
4. Literature review of the government documents reveal ambitious projects like Industrial Infrastructural Development Projects initiated in the various regions of the country by the government. While these projects are needed and must have been done in good wisdom, this study found that the expansion and marketing, consolidation and support of the existing industry is equally if not more needed. Some ways of consolidation and support can be in the following areas:

a. Government can assist the industry by establishing Business Development Center (BDC) in each Embassy where if there is market in the relevant country, they will be informed or the industry will be asked to carry out the road show for the same.

b. In acute emergency situation, the government can keep the electricity tariff flexible as per the demand and supply of the electricity. If the firms need more energy at the lesser price for the certain period of time, it may be allowed at the constant price, but the difference could be paid back to the BPC at the later date with agreed interest rate. This will help the industry to play around with seasonal price fluctuations. The credit rules and regulations may be agreed between the financial institutions, RMA and relevant agencies (MOEA AND MOF).

5. The present practice with regards to monitoring and evaluation of the various industries by the DoI is very huge and scattered as one small cell with seemingly limited human resource have to take care of monitoring a industry as large as nine sectors consisting of more than hundred large and medium firms. It is important that for a industry so large, monitoring of performance of each firms should happen individually and collectively. Hence it was seen that the Government should invent mechanism to focus on monitoring at three stages. At the Macro Level (where Corporate Governance should be strengthened), at Meso-Level (where proper human resources are being field in) and at Micro level (Accounting and Financial Information are kept properly for the ready reference).
6. Though majority of the participants stated that they do not have problem with human resource in the survey, field observation and personal communication with key informants gave quite a different view. The reluctance in sharing any problems related to human resource can hint at many things, amongst others, fear of adverse action from management. The study recommends that recruitment of adequate and educationally proficient human resource can give the firms their much needed industrial boom. While Industrial giants like India and China have set aside huge capital for human resource development to take them to become economic giants, Bhutan can learn lessons from them to move along similar path. It is also being proactive in setting aside a required budget (5-10%) of the net profit for Human Resource Development. Educationally well-endowed and skillfully talented workforce can take the industry towards becoming resilient by following an inclusive and participatory approach towards capacity building rather than top down policy demands.

CHAPTER V: CONCLUSION AND RECOMMENDATIONS

In alignment with the structure of the report, the conclusions and recommendations pertain to (i) General Observations and Lesson learned while conducting the study, (II) Factors Affecting the growth and development of the Industry; (iii) assessment of Strategic Management document and Productivity Measurement System in place in the organization, and; (iv) assessment of cross cutting Product, People, Process and Policy initiatives practiced in the organization and further assessment of the external factors leading to slow growth of the four category of the industry in Bhutan categorically.

5.1 General Recommendations (focus on Industry Administrative Issues)

A. Develop Integrated Industry Information System (IIS) :

As is mentioned in the lesson learned section, the Department greatly suffers from lack of Accounting, financial, operational, managerial and historical Industry information. Therefore, it is recommended that the Department initiate and establish Integrated Industry Information System (IIS) to support the growth and development of the Industry in the country and to achieve the vision of the Government to broaden its industrial base and sustain it.

B. Develop Business Intelligence and Marketing Centre (BIMC):

Ease of Doing Business (EOB) 2016 report shows that Bhutan's position has declined from 70th in 2015 to 71th 2016 (Ease of Doing Business , 2016). It shows that despite many business development initiatives carried out by the Government, the industry suffers from ease of doing business. Additional verbal statements gathered during informal talks after the interview pointed out that compared to other countries, Bhutan lacks Business Information (Intelligence) especially on market availability of the products and services in different countries with which Government of Bhutan has the Bilateral Relationship. Therefore, if Government wants to expand, sustain and consolidate its industrial sector, Business Information Intelligence (BII) and market intelligence service (MIS) must be established in the Department and its wings in the various countries where Bhutan has its Embassy. The same information must be shared judiciously and constructively in making investment decision by the Government.

C. Constant Monitoring and Evaluation of Industrial Performance

Industrial Boom and Bust is part of the business life cycle. But *laissez-faire* philosophy of the Government towards industry and not much of monitoring of their annual performance would cost the Government in rescuing the industry in times of economic bursts.

Therefore, proper monitoring and evaluation team for the industry in Bhutan can be set up in the Department to monitor the performance of the industry as per the agreed terms of reference developed among the stakeholders. However, monitoring and evaluation should not be to the disadvantage or disturb the industries' performance, but to support, sustain, and develop the industries in the country.

D. Set up the Productivity Benchmark for Each Category of the Industry

There is no specific benchmark in terms of profit, revenue contribution to the Government, employment to be provided to the Bhutanese or import substitutions, export promotions, foreign currency earning capacity and level etc. to be met by the industries to qualify for Economic Benefits like free access to finance, marketing promotion, human resource support and subsidies. Nor there is any understanding between the government and the Industries that at what level of revenue earning is called the best performing industry and otherwise. In the absence of any of these benchmark, it is very hard to speak in the absolute value that the industry are doing good or bad. Due to the nature of relativity, Government must ensure that such benchmark be finalized and fixed.

E. Government support on Productivity Enhancement Programs:

As stated "Without a standard there is no logical basis for making a decision or taking action." (Spring, Singapore, 2011) Government must educate each industry on Productivity Measurement and Enhancement System. Currently there is no baseline study being done for each category of the industry's productivity. It is highly recommended that separate study focused on baseline survey on Industry Productivity may be carried out immediately.

In conclusion, on the whole, since the study was on industries that were financially performing good as well as highly professionalized, technologically sound and internationally certified ISO companies, there was not much of internal issue which was leading to suboptimal performance (Productivity issues as mentioned in the figures below) of the Industry. The current problem faced by the industry were mostly of the external in nature. Except in few cases of medium and small firms under Wood and Forest Based Industry, which showed some sporadic entrepreneurial hiccups, there was technically no issue on energy optimization process, Market Expansion or improvement in the product quality, Process Efficiency, People's Effectiveness and Policy hindrances.

5.2 Summary of Industry specific recommendation

5.2. 1. Alloy Industry

To address the current Market Conditions.

Form a multi-sectoral task force inclusive of (Royal Audit Authority, Electricity Board, Bhutan Power Corporations, Ministry, BCCI, ABI, NEC and individual owner(s) of the company)to address the following areas:

- A. Recapture the market share lost to the new entrants through price competition and start clearing the stock to make profit for at least one year term (Om holdings and similar entrants). In order to do so, the government may provide power subsidy to Alloy Industry for at least one year to the point to which the costs of production become competitive enough to re capture the market lost to the new entrants.
- B. The subsidized power tariff for one year used by each industry should be charged as liability in the balance sheet of the industry and loan asset in the BPC balance sheet, and pay the agreed principal amount with interest to BPC on monthly basis after completion of one year.
- C. Decision may be taken to minimize the operation costs of the industry including salary and wages to the bare minimum.

Improve the Bargaining Power of the Industry: Raw material Sourcing and Transportation Costs

- A. Industry are advised to **form the consortium** (*including Cement Industry where they use Coal and Charcoal etc.*) to develop the better bargaining power against the supplier of the raw materials and transporters to gain the benefit of economy of scale on the costs of raw materials and transportations. After formation of the Alloy Industry Consortium, alternative sources of essential raw materials may be explored both within country and in China and neighboring countries to maximize the power of collective purchase of the raw materials.
- B. Diversification of the Alloy Industry based on the demand of the market may be done in order to improve the bargaining power of the industry.

5.2.2 Agro and Food Industry including Alcohol and Beverages

- A. In the short run, none of the firms are bankrupt but earning decent profit to sustain itself in the market. However, in long run, to depend on other countries to supply the core raw materials to the industry would be risky. With the change of political and socio economic scenarios in the regional or global market, there is a high risk of direct impact on the business performance of the industry. Therefore, in the long run, Department of Industry in association with the partner Industry must explore the possibilities of self-production of the raw materials. In addition, Government must set target and start commercial farming under Public Private Partnership (PPP) model *consistently* to meet the demand of the industry.
- B. Considering the availability of best mineral water base in Bhutan, water and beverages manufacturing industry must set the brand popularity using Brand Bhutan to sale the products in the region at the cheaper rate but in higher volume.

5.2.3 Forest and Wood Based Industry

- D. Develop the Business Birth Card (BBC) data base for each of the forthcoming, existing, and the past industry. Each Industry being monitored based on the four Business domains: (1) Potential Entrants, (2) Bargaining power of buyers (Demand), (3) Bargaining Power of Suppliers and (4) Substitutes.
- E. Government, in association with the Industry Association must establish a common professional marketing and Supply Chain agency to promote and sale the products of the Industry to various target market both within and outside the country. The resources must be pooled from all the firms and some operational costs may be borne by the Government, which could be charged in the products and recovered from the revenue.
- F. Exploration into online linkages with international online giants like Alibaba.com and other regional B2B or B2C seller can be initiated by the Industry Association to buy and sell the products online. The online payment gateway must be made user friendly, secured and trustworthy.

5.2.4 Mineral Based Industry Analysis

A. For the Mineral based industry, it is recommended that lucrative land replacement compensation plan should be designed for acquiring private as well as Government land for query through Property Acquisition and Valuation Agency (PAVA). **Prior to such initiative, proper long term cost benefit analysis may be conducted by the agency between the environmental impact and the impact of closing down the industry due to lack of raw materials to sustain its production.** Moreover, with the plan of 1 trillion rupees worth of infrastructure development in India, Bhutan can reap the benefit of it with the sale of the Cement at much cheaper rate than Indian cement. In addition, cement made in Bhutan are much cheaper and of better quality than their Indian counterparts. Hence, the revenue earned from such initiatives can be ploughed back for environmental protection, conservation and preservation plan.

B. It is also recommended that the mineral based industry can form a consortium with related industries (e.g. Alloy) using the same raw materials (Charcoal) to have an advantage of economy of scale in purchase of raw materials and an advantage in transportation cost.

Annexures

Annexure I: Semi Structured General Survey Questionnaire

 Department of Industry Ministry of Economic Affairs Questionnaire I		3
		4
		5
		Q14. Give three reasons why you don't know about the company's performance.
		1
		2
		3
This survey is conducted for the Project: Productivity Enhancement of the Existing Industry , to find out the factors negatively affecting the performance of the Industry in Bhutan. Through this survey would be finding out some concrete factors, be it be policy, environment, human resources, leadership, technology etc. to further investigate and make the practical recommendations to the Government to make conducive policy environment for the Bhutanese Industry in the country. In this regard, all the respondents are requested to respond the questionnaire with full attentions, dedications and support. Your comments, feedbacks and suggestions would be of the great help to make the study successful. This project is initiated by Department of Industry, Ministry of Economic Affairs. AMJ business research and consultancy (BRC) is the consulting firm who is implementing the project. However, if there is any reservations on your part in sharing the information, you may choose not to reveal it, if you want. Finally, we would like to mention here that the Consulting Firm will not reveal or share your information to anyone without written permission sought from your end. All the information revealed will be kept confidential.		Q15. Do you have Strategic Management Plan book? Q16. Do you have Productivity Measurement System in the Company?
		Section B: Product: a. The rule of Reduce, Resuse, Recycle of the Product impacted product positively b. Management has maintained the high level of the Customer Satisfaction Index c. Products Produced are Environmentally Friendly (Eco-Design) d. Hazard Analysis and Critical Control Points (HACCP) is always maintained e. Custom Made Products are made for the Niche Market f. Quality Management System(QMS) is always maintined in the company g. Supply Chain Management System has greatly improved the product competitiveness
		Section C:Process a. Company constanly practices Business Process Re-Engineering (BPR) system b. Just in Time (JIT) Production System is Practiced in the Company c. Preventive or Productive Maintenance System is Practiced in the Company d. Six Sigma Manufacturing Process is Practiced in the Company.
		Section D:People a.For business Excellence & Function we Practice Employee Suggestions Schemes b. In the company we practice Lean Management System (Toyota Management) c. The Company Strictly follow the Occupational Health & Safety Standards d. There is Explicit Workplace Cooperation (WPC) between Workers & Company
Section A: Geographical Identification: 2. Director/Manager 3. Supervisor Q1. Dzongkhag <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Q2. Gewog/ Thromde: Q3. Area 1.Urban <input type="checkbox"/> <input type="checkbox"/> 2.Rural <input type="checkbox"/> Q4.Scale of Industry: 1.Large <input type="checkbox"/> 2. Medium <input type="checkbox"/> Q5. Name of Industry..... Q6. Category of Industry: 1 ANB <input type="checkbox"/> 2 A <input type="checkbox"/> 3 FAB <input type="checkbox"/> 4 FAW <input type="checkbox"/> 5 IAS <input type="checkbox"/> 6 M <input type="checkbox"/> 7 MAQ <input type="checkbox"/> 8 O <input type="checkbox"/> 9 PAPI <input type="checkbox"/> Section B: Demographic Characteristics Q7. Name of the respondent:..... Q8. Status: 1. CEO <input type="checkbox"/>		4. Operational/Others (Specify)..... Q9. Gender: 1. Male <input type="checkbox"/> 2. Female <input type="checkbox"/> Q10. Age <input type="checkbox"/> <input type="checkbox"/> Q11. Do you think the company is doing its business well? 1 Yes <input type="checkbox"/> (Go to Q13) 2 No <input type="checkbox"/> (If No, go to Q12) 3 I don't know <input type="checkbox"/> (Go to Q14) Q12. then What are the Factors Affecting the Sluggish Performance the Company (Write the number in the severity): 1 Human Resources <input type="checkbox"/> 2 Obsolate Technology <input type="checkbox"/> 3 Leadership <input type="checkbox"/> 4 Management System <input type="checkbox"/> 5 Raw Material Sourcing (Uneconomic & Unreliable) <input type="checkbox"/> 6 Poor Market Conductions (External) <input type="checkbox"/> 7 Sales & Marketing Management System <input type="checkbox"/> 8 Inefficient Energy Supply <input type="checkbox"/> 9 Poor Quality of the Products <input type="checkbox"/> 10 Any other reasons..... <input type="checkbox"/> Q13. What are the five important factors making the company do well 1 <input type="checkbox"/> 2 <input type="checkbox"/>
		Section E: Policy a. Company's Performance is Measured through Balanced Score Card System(BSC) b.Business Excellence Framework (BEF) constantly practiced in the Company c.Corporate Social Responsibility is the part of Corporate Strategies d. Strategic Energy Conservation and Management System is Practice in the Company e. ISO 9000 Quality Management System is Practiced in the Company f. Government's Taxation Policy is Cumbersome and Not Business Friendly g. Environmental Policy is one of the reasons for sluggish performance of the company
		Section F: Impact of External Economic & Market Forces a. Global Financial & Economic Crisis has negatively Impacted the company performan b. Stiff competition from the Neighbouring countries negatively impacted the company c.Lack of Collective Marketing Support among the industry and the Government d. Cheaper supply of the products from India and China impacted the Market. e. Lack of demand from the prvious vendor impacted the company.
		Section G: Impact of Leadership and Management a. Company management team is excellent and Goal Oriented b. Top management is lead by qualified and experienced person c.Company has theStrategic Human Resource Management System d. Employees of the Company are highly motivated and inspired to work more
		Section H: Any other comments:
		Thank you very much for your support and time.

Annexure II: Detail Diagnostic tools for the Productivity Enhancement Process

Diagnostic Study: This study is purely to verify each books of accounts, visit the factor, observe the production process, keep the record of the manufacturing process, see the 3Rs system are in place. Check whatever systems are there in the place be verified. Whole process will be spent in the field visits and verifications.							
A GENERAL INFORMATION							
	1 Name:	First	Middle	Surname			
	2 Sex:	Female					
		Male					
	3 Age	10.-19	20.-29	30.-39	40-49	50-60	60 and Above
	4 Designation:						
	5 Name of Company						
	6 Place of Interview						
	7 Interviewer Name			Mobile#			
C SPECIFIC QUESTIONS							
I INPUT INVESTIVATIONS							
1 Raw Material Sourcing							
	1	Look at the Product (s) Produced by the Company					
	2	Find out the ingredients required by the company to buy to make this product					
	3	Investigate the raw materials they get from and Price they pay for it now and then.					
	4	Any alternative source from where they know or anyone know right now?					
	5	If yes, why they are not buying for the alternative sources and keep buying from the same?					
	6	Is there alternative raw materials (natural or artificial) to make this product(s)? Explain.					
	7	How much they buy daily, weekly, monthly, quarterly, half yearly and yearly? At what rate?					
	9	Do they know who all produce similar kind of goods in nearby states of India? Nearest India, Sikkim, Assam and Bengal. From where they buy the raw material from?					
2 Type of Technology used							
	1	See and verify what kind of technology is used now, why and any new in the market?					
	2	Where other type of technologies are used and any studies made on other or want to shift?					
	3	Make the chart of technologies use now, efficiency, effectiveness (quality, efficiency and effectiveness (zero defects)					
	4	What they suggest for the alternative use of the technology?					
3 Human Resources (Operational)							
	1	Each batch of team (time) how many products are produced?					
	2	Male female ratio					
	3	Costs per hour/day and find their productivity per day against the benchmark.					
	4	Are they operating at the highest level and are they happy with the work environment?					
4 Human Resources (Managerial)							
	1	Motivation level of the managerial level					
	2	Technical level					
	3	Training required in which areas? And any training attended so far?					
5 Strategic Level							
	1	Vision, Mission and Goals of the CEO					
	2	How he or she would like to sail his or her company out of the rough weather? Any plan of actions (Raw material sourcing, Human Resource Management, Energy Preservation and Management, Marketing & Sales)					
	3	Way forward? Do you see with the improvement in the global market, the performance of the Industry will improve?					
	4	Any Government interventions required? If yes in what areas and how you are going to repay it back?					
	5						
6 Efficient Energy Utilization Strategies							
	1	See what are the Energy (Electricity, Firewood, Fossil Fuels, Water etc.) utilization plan					
	2	What are the alternative energy utilization plan? Any simulations done by the experts?					
7 Business Intelligence							
	1	Do you have Business Intelligence Unit? (Where you get information about your supplier, customers, technology, competitor etc.?)					
8 Capital Efficiency							
	1						
	2	Get the Financial Statement for Last 5 years and see the ROI against the Net Capital worth and Returns of the Capital and do the same with labor.					
II Process Level Standards or Benchmark							
	1	Is there minimum quality or standards systems in place? (both by the workers, technology and raw materials)					
	2	What are they?					
	3	Is it up to the standards of BSB and ISO?					
	4	Why it is not adopted etc.?					
Lead time							
	1	Observe in one minute or one hour how many products are produce and how many are defects					
	2	Find the reasons why? Is it obsolete technology, is it because of inexperienced labor or					
	3	How the management is going to reduce this system.					
III Output Level							
Quality (Looks, Packages, Weights)							
	1	How many produced goods are as per the standards and pass the quality standards for the sale?					
	2	What are the rate of rejection percentage?					
	3	Which categories of the products are having the highest rate of rejection % and acceptance% ?					
III Market Scenario and Strategies							
Marketing Strategies							
	1	Do they have marketing strategies both within the country and outside the country? Study					
	2	Product lead time (Produce-Store-Order-Export) (calculate and see)					
	3	Supply chain management (Distributors, Wholesalers, Retailers, customers- B2B, B2C)					
	4	Payment terms					
	5	International Market Change and World Economic Scenario					
	6	Customer care, Feedback and Complain Management System					
Note :							
Detail diagonis will be the final touch of the study to find out the answers to the research objectives. We would be finding some space in the organization after conducting the preliminary survey no I and then we will do the diagonistic study after that. These would be the detail strategies to find out the Industry Information.							

Diagnostic areas					
	Productivity-enhancing Initiative	Impact Area			
		Product	Process	People	Policy
A	Cross Cutting				
	1 5S/Good Housekeeping				
	2 7 Wastes				
	3 Benchmarking				
	4 Green Productivity				
	5 Kaizen				
	6 Quality Circles/Work Improvement Teams				
B	Product				
	8 3Rs: Reduce, Reuse, Recycle				
	9 Customer Satisfaction Index				
	10 Eco-design				
	11 Hazard Analysis and Critical Control Points (HACCP)				
	12 Niche Marketing				
	13 Quality Management System				
	14 Supply Chain Management				
C	Process				
	15 Business Process Reengineering				
	16 Just-in-time Production System				
	17 Preventive/Productive Maintenance				
	18 Six Sigma				
D	People				
	19 Employee Suggestion Schemes				
	20 Lean (Toyota) Management System				
	21 OHSAS 18000				
	22 Social Accountability (SA) 8000				
	23 Workplace Cooperation				
E	Policy				
	24 Balanced Scorecard				
	25 Business Excellence Framework				
	26 Corporate Social Responsibility				
	27 Energy Conservation/ Management				
	28 Environmental Management System				
	30 ISO 9000 Quality Management System				
	31 National Quality Award				

Annexure III: Key Informants and Focus Group Discussion Questionnaire

Key Informant and Focus Group Discussion Questionnaire

Q. 1: Factors Leading to Sluggish Performance of the Industry in Bhutan. Please discuss and List down at least 10 points.

Q.2. What are probable solutions both at short and long run you are thinking of? Lists at least 10 Points.

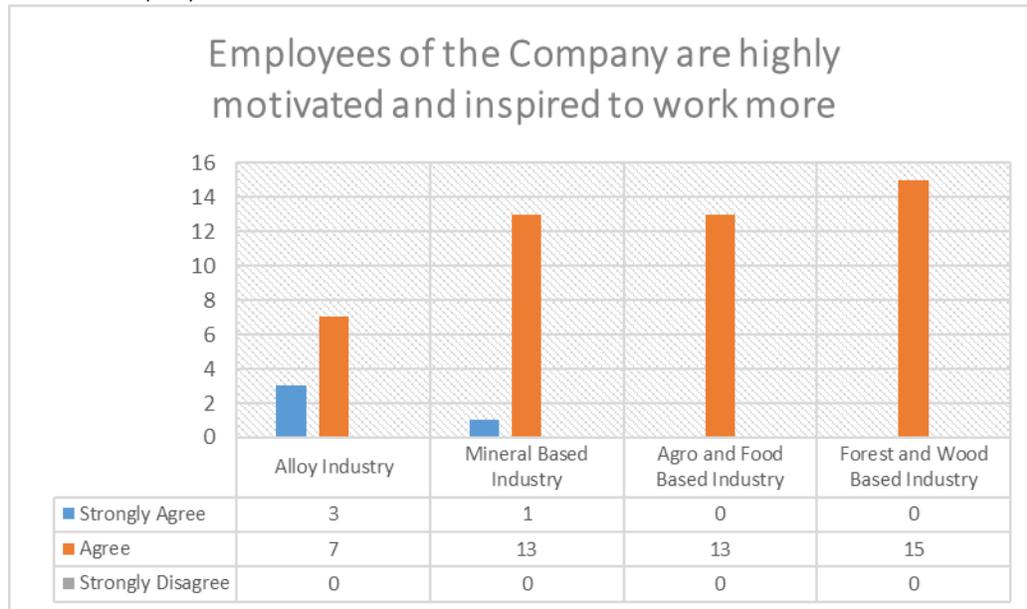
Q3. Any other comments

Annexure IV: Statistical Sampling Process

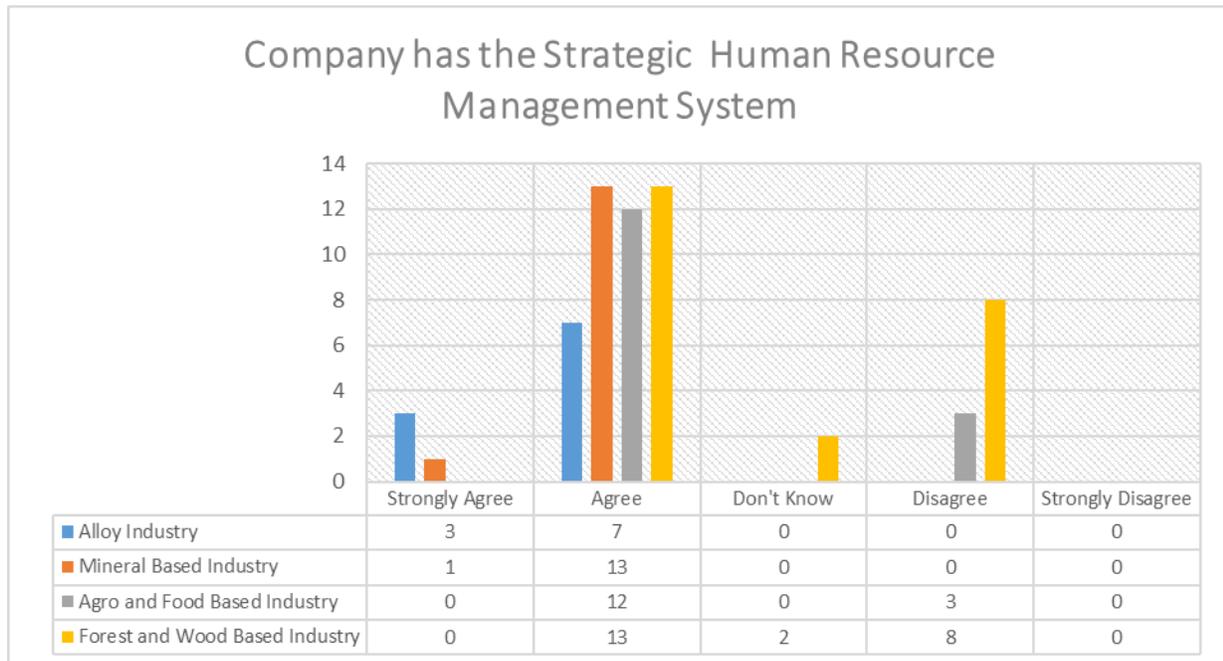
Sampling Process to study the Productivity Enhancement of the Industry (Focused on the Sluggish Performing Industry)						
A Performance of the 9 Categorized Industry (2011-2014)		Million	Rank			
1	Mineral Based	671,505				
2	Mining and Query	361,756				
3	Food and Agro Based	48,559	III			
4	Iron and Steel	-89,575	I			
5	Alcohol and Beverages	917,255				
6	Alloys	1494,380				
7	Forest and Wood Based	88,593				
8	Plastic and Packaging	2,136	II			
9	Others	122,848				
B Ranking of the Industry from the Best to the Least performing Industry						
1	Alloys					
2	Alcohol & Beverages					
3	Mineral Based					
4	Mining and Query					
5	Others					
6	Forest and Wood Based					
7	Food and Agro Based					
8	Plastic and Packaging		33%			
9	Iron and Steel					
C Sampling of the Industry						
Sampling of the Industry	n1	n2	n1xn2	N	PPP	
Alcohol and Beverages	16	15	240	148	2	Drangchu Beverages Pvt. Ltd.
Alloys	11	15	165	148	1	Druk Wang Alloys Ltd.
Food and Agro Based	12	15	180	148	1	Bhutan Agro Industries Ltd
Forest and Wood Based	16	15	240	148	2	Wood Craft Centre Limited
Iron and Steel	8	15	120	148	1	Bhutan Concast Pvt. Ltd.
Mineral Based	20	15	300	148	2	Lhaki Cement
Mining and Query	38	15	570	148	4	
Others	16	15	240	148	2	Kingyle Coke & Chemicals
Plastic and Packaging	11	15	165	148	1	Bhutan Packaging & Industries Co. Pvt.
Sampled Industry					15	Bhutan Polythene Co. Ltd.
D Sampling Methods and the Stages:				NOTE:		
I	First categorize the industry.	I As per the performance based sampling and ranking, first least performing industry are: (I) Iron and Steel				
II	Secondly find the underperforming industry in each category	(II) Plastic and Packaging Industry and (III) Food and Agro Based Industry making 33% of the total population. But				
III	Sample the minimum 30% of the least performing category of the industry (out of 9)	III sample is replaced by Alloys Industry as agreed to during the inception report presentation time. Accordingly sample				
IV	Select the sample out of three least performing industry (minimum 5% of the each category of the sample.)	is chosen. While sampling we did not take the N (Industry population as 148 (Inclusive of all newly established industry), but taken the sample from only those who were in the industry for at least five years (109)				
V	Present it to the management and start the study.					
We have taken 8 good performing and 8 bad performing from each industry for comparative study of the industries, totalling to 16 industry, instead of just 15. We did purposive sampling.				II Taking unscientific large sample with increase the risks of standard deviations and the standard errors of the data. To avoid such statistical business, the consulting team has taken career of all the statistical issues. All the activities are carried out as per the Terms of the Reference as presented by the client.		

Annexure V: Lists of Figures related to External Factors affecting Industry

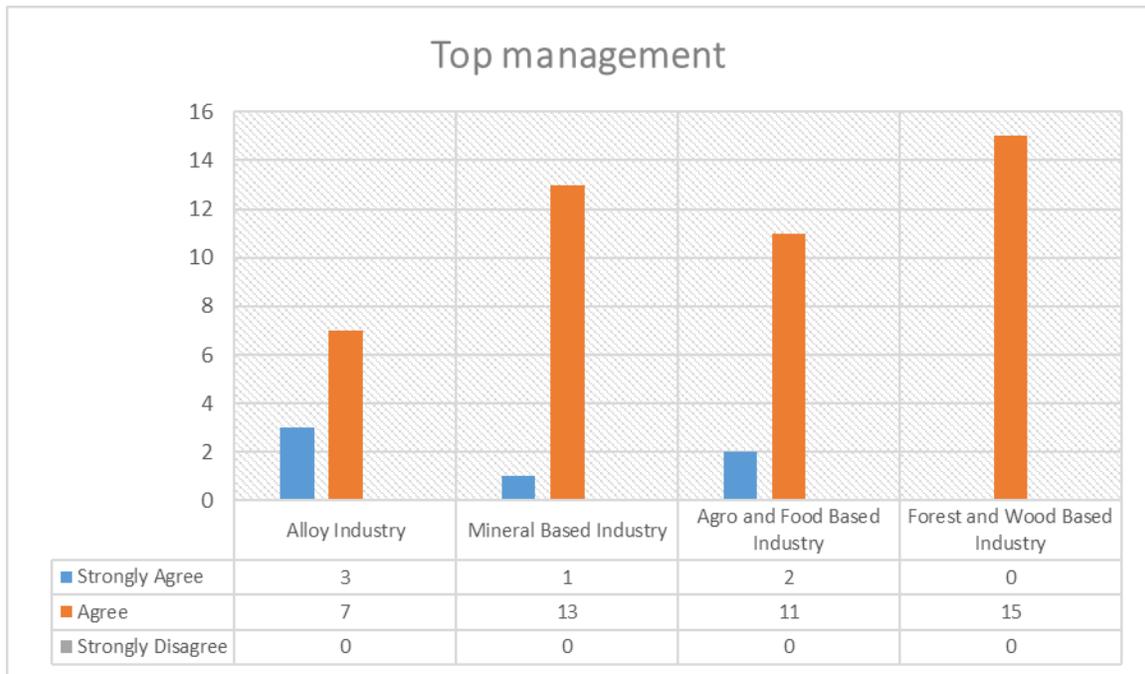
1. Employees motivation



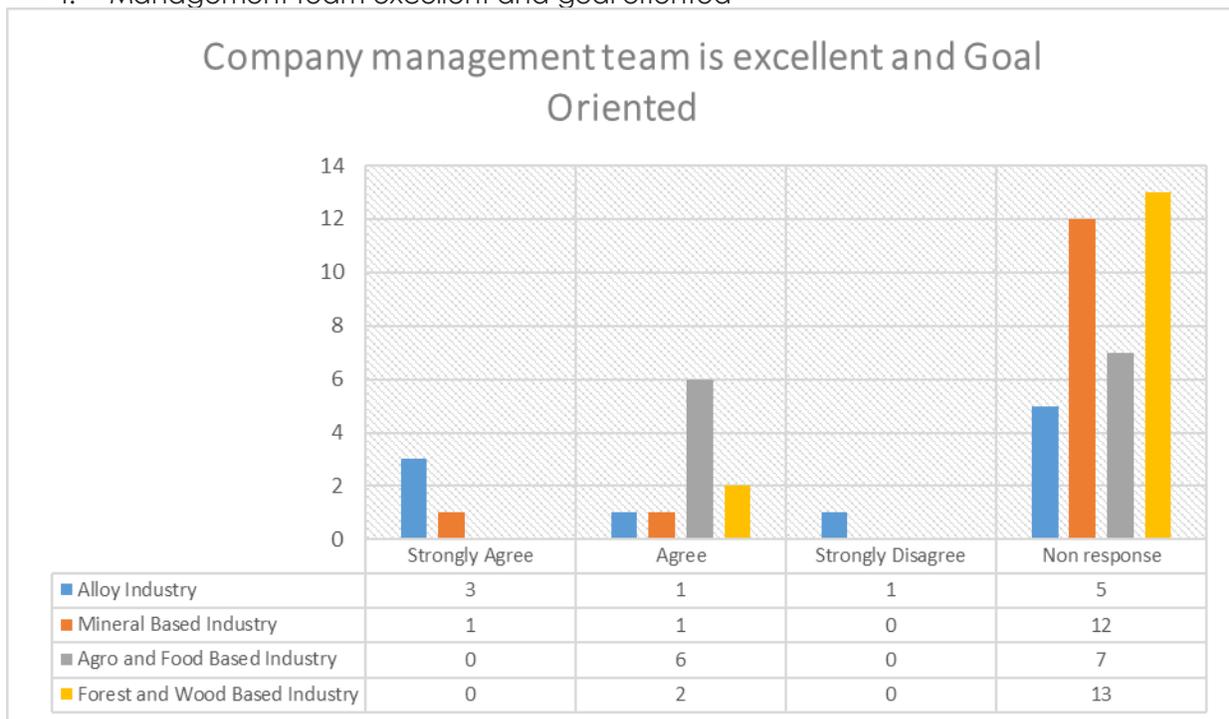
2. Company has the Strategic Human Resource Management System



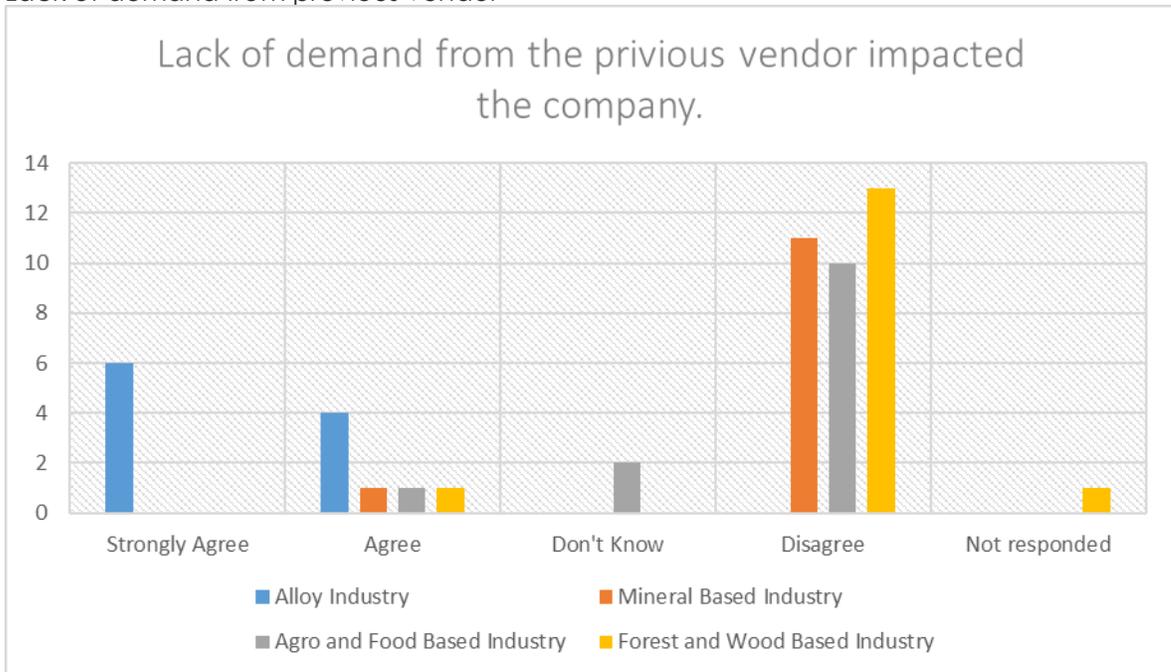
3. Top Management



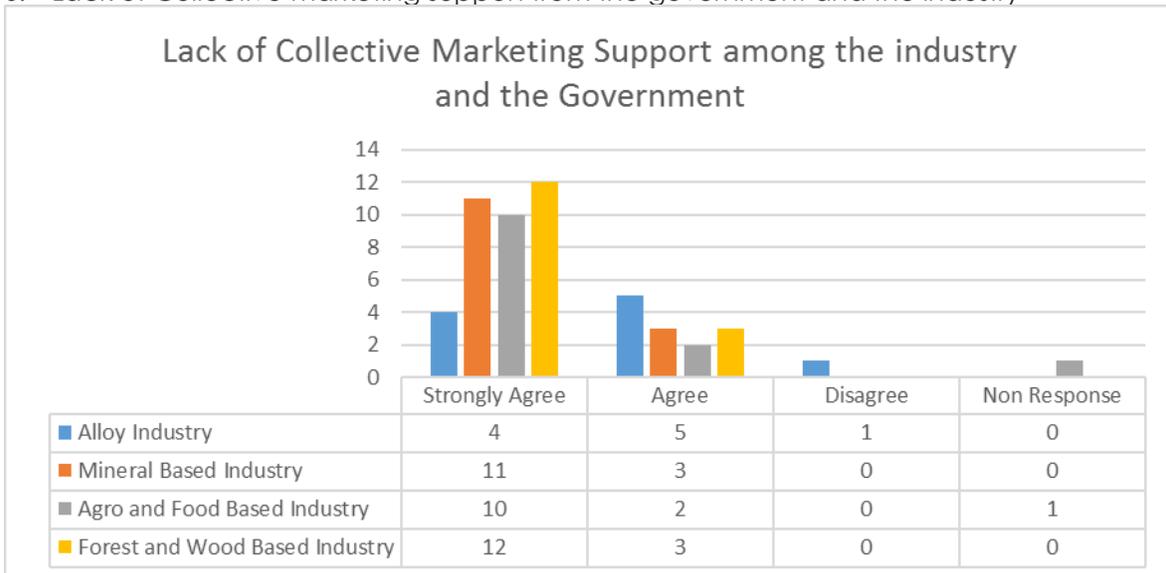
4. Management team excellent and goal oriented



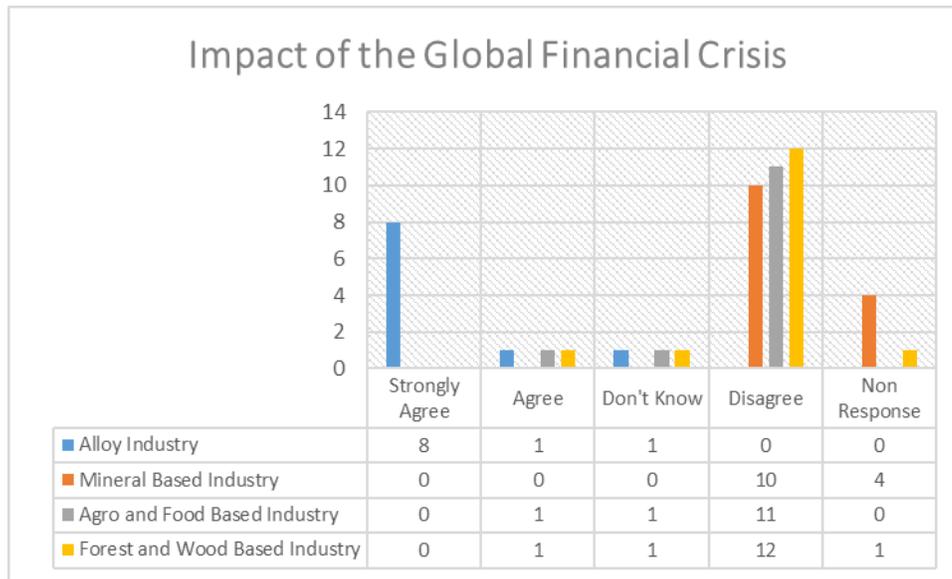
5. Lack of demand from previous vendor



6. Lack of Collective marketing support from the government and the industry



7. Impact of the Global Economic Crisis on the Industry in Bhutan



Annexure VI: Labour Productivity for some of the Companies for reference:

BHUTAN FERRO ALLOYS LIMITED (BFAL)

Year	Labor	Output	%Capacity	Revenue	Labor Costs	Operacos t	R/L	LC/L
2012	273	38,155.05	108.00	2,142.94	94.36	182.33	7.849597	0.346
2011	264	33,531.26	91.00	1,858.59	89.97	241.39	7.040114	0.341
2010	249	38,303.63	106.00	1,975.30	82.07	181.1	7.932932	0.330
2009	263	40,708.09	114.00	1,702.68	73.07	150	6.474068	0.278
2008	291	39,979.53	112.00		77.25	175.36	0	0.265

Labor Productivity based on Gross Output:

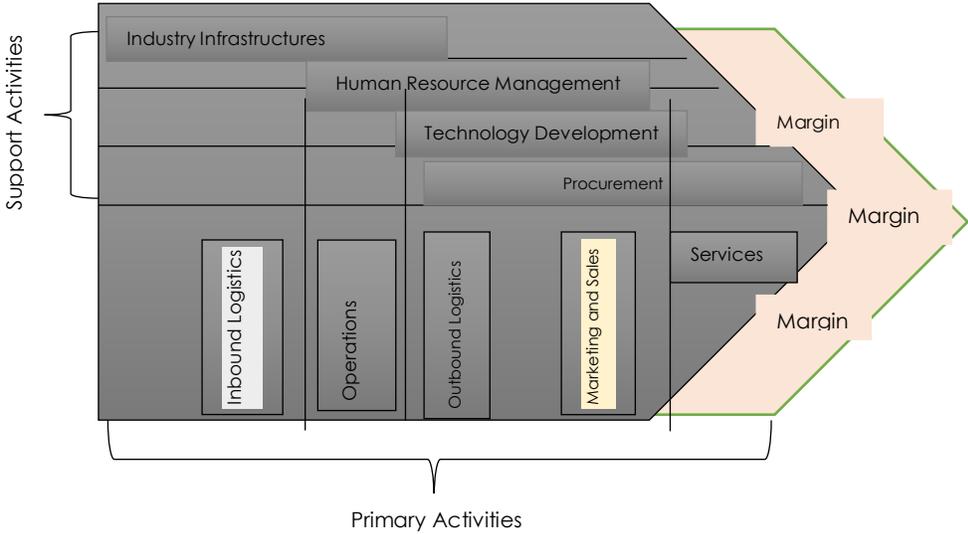
Labor					Annual	Daily/K	Hrly
-------	--	--	--	--	--------	---------	------

Productivity based on Gross Output:								
			<i>Quantity index of gross output</i>			139.762	0.388	0.048528
			<i>Quantity index of labour input</i>			127.012	0.353	0.044102
						153.830	0.427	0.053413
						154.784	0.430	0.053744
						137.387	0.382	0.047704

Annexure VII: Michel Porter Value Chain Analysis Model

Value Chain Analysis: Practical application to the current study

Figure 1: Michel Porter's Model of Value Chain Analysis



Annexure VIII: Reasons for Industry's Better Business Performance

Count		Crosstab															Total
		Q13_1															Total
Q6_Category of Industry		Missing (No Comment)	Good Magnanant system	Good Market	International Company	Market	Market Availability	Product diversification	Quality of our brand	Ready made market	Sk oil at subsidize rate.	Skilled manpower	Subsidized RM	Totally new	We have sound management system	Work Order Supply	Total
	Alloy Industry	7	0	0	1	0	0	0	1	0	0	0	0	0	1	0	10
	Mineral Based	11	0	0	0	0	0	0	0	1	0	1	1	0	0	14	
	Agro and Food Based Industry	7	1	2	0	1	1	0	0	1	0	0	0	0	0	13	
	Forest and Wood Based Industry	11	0	1	0	0	0	1	0	0	0	1	0	0	1	15	
Total		36	1	3	1	1	1	1	1	1	1	1	1	1	1	52	

Count		Crosstab																	Total
		Q13_2																	Total
Q6_Category of Industry		20	Availibility main raw material in Bhutan	Good Leadership	Good Management	Good Quality of product	Good Team	Good teamwork	Good Worker	Management	Market availability	Markey availability	Nich Market	Not able to comment	Raw Materials	Seasonal Basis	Team Work	we are ISO Certified Company for ISO 9001,14001, 18001	Total
	Alloy Industry	7	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	10
	Mineral Based	11	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	14
	Agro and Food Based Industry	6	0	1	1	1	1	0	0	1	0	0	0	0	1	1	0	0	13
	Forest and Wood Based Industry	12	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	15
Total		36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	52

Count		Crosstab															Total
		Q13_3															Total
Q6_Category of Industry		20	Availibility Market	Availibility of Spring Water	Category, Planning	Collective responsibility	Expenditure	Good Management Team	Good Manpower	Leadership	Low power Tariff.	Market	Raw Material Availability	Technology	we have transparent system of doing business	Total	
	Alloy Industry	7	0	0	1	0	0	1	0	0	0	0	0	0	1	10	
	Mineral Based	12	0	0	0	0	0	1	0	0	1	0	0	0	0	14	
	Agro and Food Based Industry	6	1	1	0	0	1	0	1	1	0	1	0	1	0	13	
	Forest and Wood Based Industry	12	0	0	0	1	0	0	0	0	0	0	1	1	0	15	
Total		37	1	1	1	1	1	2	1	1	1	1	1	2	1	52	

Annexure IX: Industrial Productivity Index

Product: Productivity Initiative		
Industry		Index
Alloy Based Industry	KRA 1	4.26
Mineral Based Industry		4.37
Agro and Food Including Alcohol and Beverages		4.12
Forests and Wood Based Industry		4.07
Process: Productivity Initiative		
Industry		Index
Alloy Based Industry	KRA 2	3.78
Mineral Based Industry		3.63
Agro and Food Including Alcohol and Beverages		3.98
Forests and Wood Based Industry		4.05
People: Productivity Initiative		
Industry		Index
Alloy Based Industry	KRA 3	4.13
Mineral Based Industry		4.16
Agro and Food Including Alcohol and Beverages		4.85
Forests and Wood Based Industry		4.88
Policy: Productivity Initiative Intact		
Industry		Index
Alloy Based Industry	KRA 4	4.85
Mineral Based Industry		4.13
Agro and Food Including Alcohol and Beverages		4.19
Forests and Wood Based Industry		3.96
External Market: Impact of External Market		
Industry		Index
Alloy Based Industry	KRA 5	4.90
Mineral Based Industry		4.27
Agro and Food Including Alcohol and Beverages		4.61
Forests and Wood Based Industry		4.86
Leadership/Entrepreneurship: Impact on Productivity		
Industry		Index
Alloy Based Industry	KRA 6	4.50
Mineral Based Industry		4.18
Agro and Food Including Alcohol and Beverages		4.00
Forests and Wood Based Industry		3.97

Annexure 12: Lists of 9 sectors with discrepancy in the scale of Operations

F	ALLOYS	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
1	Bhutan Alloys Steel Casting	M	Pasakha IE	DOM	L	A	O
2	Bhutan Carbide & Chemicals Industry Ltd.	L	Pasakha IE	DOM	L	A	O
3	Bhutan Ferro Alloys Ltd.	L	Pasakha IE	DOM	L	A	O
4	Bhutan Silicon Metals Pvt. Ltd.	L	Pasakha IE	DOM	L	A	O
5	Druk Ferro Alloys Ltd.	L	Pasakha IE	DOM	L	A	O
6	Druk Wang Alloys Ltd.	L	Pasakha IE	DOM	L	A	O
7	Pelden Enterprise Ltd.	L	Pasakha IE	DOM	L	A	O
8	Saint Gobain Ceramics Materials Pvt. Ltd.	L	Pasakha IE	FDI	L	A	O
9	SD Eastern Bhutan Ferrosilicon Pvt. Ltd.	L	Samdrupjonkhar	DOM	L	A	O
10	SKW-Tashi Metals & Alloys Pvt. Ltd.	L	Pasakha IE	FDI	L	A	O
11	Ugen Ferro Alloys Pvt. Ltd.	L	Pasakha IE	FDI	L	A	O

C	FOOD & AGRO-PROCESSING	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
1	Bhutan Agro Industries Ltd	L	Thimphu	DOM	L	FAAP	O
3	Bhutan Fruit Products Pvt. Ltd.	M	Samtse	DOM	L	FAAP	O
4	Bhutan Milk & Agro Pvt. Ltd.	M	Phuentsholing	DOM	L	FAAP	O
8	BV Areca	M	Pasakha	DOM	M	FAAP	O
5	Dralha Flour Mill	M	Phuentsholing	DOM	M	FAAP	O
6	Karma Feeds	M	Phuentsholing	DOM	M	FAAP	O
11	Kissan Arecanut Processing Unit	M	Gelephu			FAAP	
12	Koufuko International Pvt. Ltd.	M	Chenari, Trashigang	FDI	L	FAAP	O
7	Omzim Betelnut Processing Unit	M	Balujhora			FAAP	
10	Sersamg Agro & Food Industries (under construction)	L	P/Ling			FAAP	
9	Thai President Food Bhutan Pvt Ltd (under construction)	L	Samsechonggang, Chukha			FAAP	
2	Zimdra Food Pvt. Ltd.	L	Toribari	DOM	L	FAAP	O

A	MINERAL BASED	SCALE	LOCATION	INVESTMENT	Scale	Sectors	Status
2	Barma Chemical Industries	M	Pemagatshel	DOM	M	M	O
3	Bhutan Bricks Pvt. Ltd.	M	Pasakha	DOM	NO	M	O
5	Bhutan Concrete Bricks	M	Bjemina	DOM	NO	M	O
6	Bhutan Gypsum Products Pvt. Ltd.	M	Pemagatshel	DOM	M	M	O
7	Druk Cement Compant Pvt.Ltd	L	Pasakha	DOM	L	M	O
8	Druk Gypprduct & Chemical Ltd.	M	Samdrupjongkhar	DOM	L	M	O
9	Druk Mining Pvt. Ltd.	M	Kamji, Chukha	DOM	M	M	O
10	Druk Plaster & Chemicals Ltd.	M	Samdrupjongkhar	DOM	M	M	O
11	Druk Satair Corp. Ltd.	L	Pemagatshel	DOM	L	M	O
12	Dungsam Cement Corporation Limited	L	Nganglam	DOM	L	M	O
13	Lhaki Cement	L	Gomtu, Samtse	DOM	L	M	O
1	Penden Cement Authority Ltd.	L	Gomtu, Samtse	DOM	L	M	O
14	RSA Pvt Ltd. (Marble Unit)	M	Pasakha IE	DOM	M	M	O
15	RSA Pvt. Ltd. (Carb Unit)	M	Bjemina, Thimphu	DOM	M	M	O
16	RSA Pvt. Ltd. (LSU)	M	Bjemina, Thimphu	DOM	M	M	O
17	SD Eastern Bhutan Coal Co. Ltd.	L	Samdrupjongkhar	DOM	L	M	O
18	Yangzom Cement Industry	M	Samtse	DOM	M	M	O
19	Yoezer Bricks	M	Sarpang		M	M	

D	ALCOHOL AND BEVERAGES	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
1	Army Welfare Project Ltd (Santse and Gelephu)	L	Samtse/Gelephu	DOM	L	ALB	O
15	Bhutan Aqua	M	Hontsho, Thimphu			ALB	
2	Bhutan Brewery Pvt. Ltd.	M	Samphelling		L	ALB	
10	Bhutan Dew Fresh Spring Water	L	Phuentsholing			ALB	
4	Bhutan Himalayan Water Plant	M	Phuentsholing			ALB	
12	Bhutan Ventures Brewery	L	Namchagang, Chukha			ALB	
17	Bhutan Water Namakee	M	Paro			ALB	
7	Dagala Water Bottling Plant	M	Jigmeling			ALB	
5	Drangchu Beverages Pvt. Ltd.	M	Gomtu	DOM	M	ALB	O
14	Greenfield Brewery	M	Phuentsholing IE	DOM	M	ALB	O
11	Kinjore Brewery Pvt. Ltd.	L	Pasakha IE	DOM	L	ALB	O
13	Lhaki Brewery	M	Rangeytong, Chukha			ALB	
18	Majestic Mineral Water	L	Banstar, Samtse	FDI		ALB	O
16	Mountain Fresh Pvt. Ltd.	L	Pasakha	DOM	M	ALB	O
8	Serbum Microbrewery (Under construction)	M	Dagala, Thimphu			ALB	
3	Tashi Beverages Ltd.	L	Pasakha IE	DOM	L	ALB	O
9	Uhmchuna Brewery (Under construction)	M	Phuentsholing	DOM		ALB	O
6	Veen Waters Bhutan Pvt. Ltd.	L	Diana, Samtse		M	ALB	

G	FOREST & WOOD BASED	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
1	Adruka Private Limited	M	Thimphu	FDI	L	FAW	
2	Bhutan Board Products Ltd.	L	Darla, Chukha	DOM	L	Operatio	O
15	Bhutan Furniture & Steel Furniture Manufacturing	M	Phuentsholing			FAW	
3	Bhutan Furniture and Steel	M	Phuengsholing	DOM	L	FAW	O
13	Bhutan Furniture Unit	M	P/Ling			FAW	
4	Bhutan Ply Unit	M	Phuengsholing	DOM	M	FAW	NOP
5	Bhutan Sawmill	M	Phuengsholing	DOM	M	FAW	UC
6	Bhutan Wood Panel Industries	L	Phuengsholing	DOM	M	FAW	O
16	Dragon Shingdum Industry	M	Phuentsholing			FAW	
14	Gedu Wook Manufacturing Corporation	M	Gedu			FAW	
7	Green Wood Manufacturing Corporation	M	Phuengsholing	DOM	M	FAW	O
8	Majur Wood Industry	M	Samdrupjongkhar	DOM	M	FAW	NOP
9	Ongdi Timbers Industries	M	Khasadrapchu, Thimphu	DOM	M	FAW	O
11	Tashi Resin & Turpentine Industry	M	Samdrupjongkhar	DOM	M	FAW	O
10	Wood Craft Centre Limited	L	Thimphu	DOM	M	FAW	O
12	Y.R.D Industries (Furniture)	M	Thimphu			FAW	

B	MINING & QUARRYING	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
2	Adagangchu Stone Quarry	M	Wangdue			M&Q	
3	Begagong Stone Quarry Pvt. Ltd.	M	Bjena, Wangdue			M&Q	
4	Bhutan Crushing Unit	M	Pugli, Samtse	DOM	M	M&Q	O
5	Bhutan Green Aggregate & Sand	M	Bhurkhola, Sarpang			M&Q	
6	Bhutan Stone & Aggregate Factory	M	Mewangd, Thimphu	DOM	M	M&Q	O
7	Bhutan Stone & Mineral	M	Samtse		M	M&Q	
8	CDCL Stone Crushing Unit	M	Drepong, Mongar			M&Q	
9	Dawa Dotshang Pvt. Ltd.	M	Dogar, Paro	DOM	M	M&Q	O
10	Dhendup Stone Crushing Unit	M	Sjongkhar	DOM	M	M&Q	O
11	Dolliwa Stone Quarry	M	Dolliwa, Wangdue			M&Q	
12	Druk Mining Pvt Ltd.	M	Kamji	DOM	M	M&Q	O
13	Druk Norbu Kuenphen Mining	M	Kunkha/Chukhan			M&Q	
14	Gebakha Stone Quarry	M	Wochugang, Wangdue			M&Q	
15	Gewachu Stone Crushing Unit	M	Wewachu, Wangdue			M&Q	
16	GP Aggregates	M	Sjongkhar		M	M&Q	O
17	Homdar Crushing Plant	M	Zhemgang			M&Q	
1	Jigme Industries Pvt. Ltd.	M	Samtse	DOM	L	M&Q	O
18	Jigme Industries Pvt. Ltd.	M	Samtse	DOM	L	M&Q	O
19	Jigme Mining Corporation Ltd.	L	Chunaikhola, Samtse	DOM	L	M&Q	O
20	Jomokha Quartzite Mine	M	Jomokha, Chukha			M&Q	
22	Jungomla Stone Quarry	M	Bjena, Wangdue			M&Q	
23	Kilikhar Stone Crushing Unit	M	Kilikhar, Mongar			M&Q	
24	KNT Stone Processing Unit	M	Paithachu, Sarpang	DOM	M	M&Q	O
25	Kuenphen Norden Mining	M	Thimphu	DOM	M	M&Q	O
26	Kuenphen Norden Crushing & Powdering Unit	M	Pasakha IE			M&Q	
27	Lhaki Dolomite & Mining Industries	M	Duarpani, Samtse	DOM	M	M&Q	O
28	Lomekha Stone Quarry & Aggregate	M	Drakarpo, Paro			M&Q	
29	Nortak Mines & Minerals	M	Gidaphu, Thimphu			M&Q	
30	Quality Stone & Aggregate Factory	M	Siligang, Thimphu	DOM	L	M&Q	O
31	Radak Co. Pvt. Ltd.	M	Wangdue			M&Q	
32	Samden Dolomite	M	Pugli			M&Q	
33	Samden Dolomite	M	Sjongkhar			M&Q	
34	Taktshang Aggregate & Sand Plant	M	Gidaphu, Thimphu			M&Q	
35	Tara Dolma Ghardar Mines	M	Gardara, Samtse			M&Q	
36	Tingzam Stone Crushing	M	Drepong, Mongar			M&Q	
37	Upper Gida Stone Quarry	L	Gidaphu, Thimphu			M&Q	
38	Yurmong Stone Quarry	M	Trongsa			M&Q	

E	IRON AND STEEL	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
6	Bhutan Concast Pvt. Ltd.	L	Pasakha IE	DOM	L	IAS	O
1	Bhutan Rolling Mills Ltd.	L	Pasakha	DOM	L	IAS	O
2	Bhutan Steel Industries ltd	L	Pasakha	DOM	L	IAS	O
3	Druk Iron & steel Pvt.ltd	L	Ramitey	DOM	L	IAS	O
4	KK Iron & Steel Pvt.Ltd	M	Pasakha IE	DOM	M	IAS	O
5	Lhaki Steel & Rolling Mills Pvt. Ltd.	L	Pasakha IE	DOM	L	IAS	O

H	PLASTIC & PACKAGING INDUSTRIES	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
6	Bhutan Packaging & Industries Co. Pvt. Ltd.	L	Pasakha IE	DOM	M	PAPI	O
7	Bhutan Plastic Industry	M	Pasakha			PAPI	
1	Bhutan Polymers Co. Ltd.	L	Gomtu	DOM	M	PAPI	O
2	Bhutan Polythene Co. Ltd.	L	Phuentsholing	DOM	M	PAPI	O
10	Jigme Polytex Pvt. Ltd.	M	Lhamoizhingkha, Dagana	DOM	M	PAPI	0.000
11	Kenpa Pvt. Ltd. (PET Preform)	M	Pasakha	DOM	M	PAPI	O
3	RSA Pvt Ltd. (Poly Unit)	M	Phuentsholing	DOM	L	PAPI	O
8	Soenam Yangchuk Poly Pet Unit	M	Phuentsholing	DOM	M	PAPI	O
4	Soenam Yangchuk Pvt. Ltd. (Poly Pet Unit)	M	Phuentsholing IE	DOM	M	PAPI	O
9	Tashi Tarpaulin Factory	M	Phuentsholing	DOM	M	PAPI	O
5	Yarab Pvt. Ltd. (Pipe Unit)	M	Phuentsholing	DOM	M	PAPI	O

I	OTHERS	SCALE	LOCATION	INVESTMENT	scale	Sectors	Status
1	Bhutan Battery	M	Ramitey	DOM	M	O	O
	Bhutan Bitumen						
2	Industris Pvt. Ltd.	M	Pasakha	DOM	M	O	O
9	Bhutan Pharmaceutical	M	Gomtu			O	
3	Dharma Arts & Crafts	M	Bjemina, Thimphu	DOM	L	O	O
13	Dispotech	M	Pasakha			O	
4	Dugnsam Polymers Ltd.	L	Nganglam	DOM	L	O	O
5	Kimpex Pvt. Ltd.	M	Pasakha IE	DOM	L	O	O
6	Kingyle Coke &	L	Samphelling, P/Ling	DOM	L	O	O
12	Majur Oxygen & Gases	M	Balujora	DOM	M	O	O
10	Neethsel Pvt. Ltd	M	Toribari	FDI	L	O	O
7	Omzim Manufacturing	M	Bhalujora	DOM	M	O	O
11	Pelela Printers &	M	Phuentsholing			O	
8	Quality Gases Pvt. Ltd.	M	Pasakha IE	FDI	M	O	O
15	RSA Pvt Ltd. (Wall	M	Pasakha IE			O	
14	Tsherim Industry	M	Pasakha			O	
16	Zindra Building	M	Thimphu	DOM	L	O	O

Annexure 13: Machines' capacity utilization for Alloy Industry

Year	Capacity utilisation of the Machines												
2015													
2014		0.00	211.58		105.00	99.18	100.00	98.00	84.00	8.00	95.00	100.00	100.08
2013		0.00	203.09	96.00	96.00	96.00		102.00	81.00	63.00		93.00	103.76
2012	108.00	0.00	152.37	93.00	96.82	95.60	100.00						107.63
2011	91.00	0.00	171.15		87.65	105.60	100.00						111.08
2010	106.00	0.00	207.96	99.00	90.08	97.11	100.00						116.69
2009	114.00	0.00	134.36	87.00	64.46	73.50							78.89
2008	112.00	0.00	138.22	66.00									105.41
												Average Capacity utilization of Machines	103.36
Year	Investment on Human Resource Development												
2015													
2014		0				21	31.00	65			20		137
2013		1			2.00	7.00	14.00						24
2012													
2011													
2010													
2009													
2008													

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