



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF  
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology  
Vol. 08, Issue, 06, pp.5012-5027, June, 2017

## RESEARCH ARTICLE

### OVERALL IMPACTS OF MINING ON THE STATE ECONOMY OF GOA: A COMPARATIVE PERSPECTIVE OF PRE AND POST MINING BAN PERIODS

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#### ARTICLE INFO

##### Article History:

Received 14<sup>th</sup> March, 2017  
Received in revised form  
19<sup>th</sup> April, 2017  
Accepted 21<sup>st</sup> May, 2017  
Published online 30<sup>th</sup> June, 2017

##### Key words:

Impact, Mining,  
Pre and Post Ban,  
Agriculture.

#### ABSTRACT

The Mining has been playing an important role in the economy of Goa. It is foreign exchange earner for the country and contributor both to the state exchequer and the GSDP of Goa before the post Shah Commission ban was imposed in Sept. 2012. Recently, it has been designated as the industry at par with tourism. It has provided trigger to boost the local economy of the mining taluks. Certain natural factors like the presence of coastline, a very good natural harbour situated at the Mormugao Port Trust (MPT), Vasco-da-Gama and a web of navigable perennial rivers has facilitated economic exploitation present in the state of Goa. As compared to road and rail transport barges is the fastest and cheapest mode of ore movement. Goa has title of state that exports high amount of iron ore nearly above 50 per cent of country's exports. During the pre-ban period Goa amounted to nearly Rs. 1000 crore per year according to foreign exchange reserves position. Mining in Goa is carried out by mining method called as open-cast method where the removal of overburden is a priority that lies above the ore deposits. Ratio of the excavated overburden to actual ore in Goa is also high and is almost 3 to 1. On yearly basis the average production of iron ore is almost 16 million tonnes. Large amount of removed topsoil (overburden) deposition or storage at the mining sites creates headache to mine owners as its presence on the mining sites without covering it up and without undertaking any precautionary measures for the same has led to many environmental hazards and other respiratory problems. If the solid waste left untreated as it is then is washed down in the rivers by monsoon rainfall and in the sea bed thus causing both ground water pollution and adversely affecting the fish and other creatures in the sea. During the monsoon this untreated mine waste is also washed in to the cultivation fields because the mine fields of Goa are in a close proximity of agricultural fields. Under such circumstances for many farmers it has made them to completely abandon the cultivation. And for many others the mining pollution has been instrumental in reducing agricultural yield levels. Transportation of iron ore has also affected agricultural fields adversely in the proximity. The effect of dust has adversely affected the crops in the fields. The pits that are left behind after mining is done are to be taken care of accordingly as prescribed by the law. But the majority of mines leave these pits open thus creating a breeding ground for various pests and flies that causes diseases such as Malaria, etc. This has adversely affected the people living in the proximity of mining areas. Mining has also threaded the forest cover as well as posing irreversible damage to the ecosystem. Mining corporations are also indulging in illegal mining in some areas without proper permits. It is with this approach the present researcher has made an attempt to study the impacts of mining on the state economy of Goa. Mainly the study is based on the primary data obtained from two taluks respectively one each from the North and South Goa where mining before the post Shah Commission ban of September 2012 was in full swing. Study is limited to two taluks respectively one is from South and North Goa. The taluks are Sanguem and Bicholim. Another significant confinement of the present study is that it is based on the primary data obtained from a total of 204 households from the above mentioned respective taluks in the vicinity of which iron ore mines are located. The period of the primary data collection comprises of the period between November 2014 and April 2015.

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#### INTRODUCTION

Since the segregation of taluks we now have altogether 5 mining taluks namely Bicholim, Sattari, Dharbandora, Sanguem and Quepem spread in North and South Goa respectively.

Mining activity has been on upswing in last few years thanks to the increased iron ore prices in the international market in 2008<sup>1</sup>. Mining practice in Goa has been the open-cast method which requires the deforestation, removal of the topsoil below which there are mineral deposits and finally digging out the

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<sup>1</sup>Basu Rahul (2012), 'Mining in Goa: Beyond Forest Issues', Economic and Political Weekly, Vol. XLVII, No. 3, January 21, 2012.

ore body from the earth bed. Goahas the mineral deposits of iron, manganese and bauxite. The mining area of Goa roughly comprises of 700sq.km and is spread in five taluks namely Bicholim, Sattari and Dharbandora of North Goa district and Sanguem and Quepem taluks of South Goa district. Mining and the other associated activities present have largely affected the nature around the mining area region by digging out huge pits and the final dumping of waste rejects created lot of problems to the people living near mining sites. These mining wastes are washed by heavy rains into the rivers thus affecting the marine organisms such as fish, sea plants, etc. thereby endangering their life too. After having extracted the expensive and high value ore only the low-grade ones remains which is also extracted and transported via barges because of the existence of good navigable inland rivet network that Goa has that helps in exporting the low grades iron ore a reality. History shows that the first ever export of 100 tonnes of iron ore took place in the year 1947. The exports touched 1 million tonnes by 1954, 10 million tonnes by 1971, and 13-15 million tonnes in 1980s followed by the further increase in production to 33 million tonnes as a result of Asian neighbours demand for iron ore specifically from China.

Goa has a unique mining industry which has high overburden to ore ratio that necessitates large volume material handling because of its sheer size and need of sufficient space to dump the excavated or mined overburden. It is very interesting to note that the excavation ratio in Goa is 3:1 that means when every tonne of ore is mined with it three tonnes of soil is also extracted leading to large waste accumulation per tonne of ore mined. Earlier, the ratio of mud/overburden to ore was 3:1, now it is 4: 1 that shows the increasing amount of generation of overburden that eventually results into environmental problems. This puts the issue of environment destruction at top position as the compilation of this ratio would put annual excavation of ore from all Goa mining sites and multiply by three giving lot of soil excavation that is simply piled up at mining sites in the form of large amounts of overburden. The size of the mining pits is really dangerous. This overburden carrying low grade ore is stocked up on mining sites and sometimes even this is also exported when demand shoots up.<sup>2</sup> Mining has resulted in generation of different types of pollution that has stopped production of agricultural crops along with trees now bearing the fruits. Villages in Bicholim Taluk have been subject to field lying of no use which is clogged up with overburden and destruction of fodder of animals has also adversely affected the dairy farming. Agricultural lands and other vegetations that flourished in abundance prior to full swing mining are struggling now to grow since the onset of full swing mining activities in the state of Goa. With the amount of dust reduced, farmers have begun cultivating their fields growing chillies and other pulses. There is also blossom of sacred groves post mining ban that is of spiritual value to the villagers.

Mining is the process that leads to extracting valuable minerals or other geological materials out of the earth from an ore body which is a mineralized package of value to the economy. Ores that are recovered by the process of mining include metals as well as non-metals. Mining is undertaken to obtain those materials which are impossible to be produced by the agricultural processes, or created in laboratory or factory.

Mining in an aggregate sense refers to the extraction of the non-renewable resource such as petroleum, natural gas, etc. Stone and metal mining has been going on since pre-historic times. Advanced mining processes undertake prospecting of the ore bodies, economic value of a proposed mine; mining out the minerals and at the end reclamation of the land post mining of entire ore deposits. Open Cast or Strip Mining is ratified to be the severe hazardous form of industrial activities in the world owing to its large scale adverse effects. Worldwide this method is dropped out and other alternative methods have been adopted by the companies to maintain environmental safety. The Mining industry of India is a crucial industry that in its own capacity contributes to the economy of India. The GDP contribution by the mining industry to the economy varies from 2.2 per cent to 2.5 per cent only but going by the GDP of the total industrial sector consists of almost 11 per cent. Irrespective of the scale on which mining is done it contributes 6 per cent to the all-round cost of mineral production of India. Indian mining industry makes available employment opportunities to almost 700,000 people. India is one of the largest producers of products such as sheet mica, in iron ore production it ranks third and in bauxite it occupies fifth place. The metal and mining industry of India was valued at \$106.4 billions in 2010. The tradition of mining in the region has been going on generationally and carried on even after the independence of the country from the British rule and the subsequent change that occurred in the technology adopted for undertaking the mining. The economic reforms undertaken in 1991 and the adoption of the 1993 National Mining Policy further fuelled the growth of the mining sector in India. India's minerals consist of both metals as well as non-metals. The metallic minerals are both ferrous as well as non-ferrous in nature while the non-metallic minerals consist of mineral fuels, precious stones, etc.

Since, mining being one of the major important economic activities in the state of Goa is crucial to the state economy. Therefore it was important to study the mining activities that are going on in the state of Goa. For mining the state of Goa is a unique and altogether different than any other mine rich state in the country. Mainly the iron ore mines of Goa are rich in contents. Another special characteristic of the mines of this state is the close proximity of the mine field to that of the ocean which makes transportation cheaper and exports easier than other mineral states such as Karnataka, Odisha and Jharkhand, etc. The mined ore is first transported by trucks to the river banks of Mandovi and Zuari where the ore is loaded on to the barges which take it to the ports at the seashore. From there the ore is exported. Seven thousand (7000) registered trucks at present transport iron ore from the fields to the river barges. Once the mining in the state resumes in full swing there will be 15000 trucks plying on the roads of this smallest state of the country. The mines of Goa are also in a close proximity of the agricultural fields which has caused many problems for the cultivation. Mainly it has destroyed the agricultural fields, reduced the production and yield levels and in some cases the farmers had to completely abandon their cultivation as the mine waste is flushed in to their cultivation fields. Goa is a state with a thick forest cover with rich flora and fauna, the special characteristic of the "Western Ghats". The state is also rich in the wild life habitat which according to many reports is disturbed by the open surface mining in the state. The mining in this state has also caused many health problems and the people in the proximity of mine fields and

<sup>2</sup>Terence Jorge, Hagen De Sa and Pushp Jain (October, 2013).

roads that are used for mine truck transportation are the main victims. No doubt that the mining economy of the state before the imposition of the ban in December 2012 was one of the preponderant sectors of the state economy of Goa. It had significantly contributed to the state exchequer as well as to the GSDP of Goa but the value of environmental degradation, loss it caused to the flora, fauna, and wild life habitat and to the human health and farming economy is far more than its contribution to the state exchequer and the GSDP of Goa. It is with this background in mind the present researcher had attempted to study the impacts of mining in the state of Goa so that the faults that attributable to mining have caused all above stated problems to the people, nature and environment and the society of the state can be brought out by the field level study and addressed to in future. The survey of the mineral deposits of India is undertaken by the Ministry of Mines, which also frames laws regulating mining and use of these minerals. The ministry also keeps a hawk eye on the progress of the mining industry of India. The Geological Survey of India and the Indian Bureau of Mines are also agencies that come under the control of the ministry of mines. Natural gas, petroleum and atomic minerals are among few that are exempt from the Indian Ministry of Mines activities.

## MATERIALS AND METHODS

The present study had intended to find out the impacts of indiscriminate mining on the economy of Goa. Hence the study had depended on authentic and relative Primary and Secondary Data from various sources. The secondary data for over a period of ten years comprising the period between 2004-05 and 2013-14 were obtained from the state economic surveys of Goa for years. These data sources were used for the purpose of locating among other sectors the relative significance of iron ore mining in the state economy of Goa. Through these data we attempted to locate the exact place of the mining sector in the state economy through its contribution to the GSDP and NSDP both at the current and constant prices. This exercise could help us in segregating the role of the mining sector in to two time periods i. e. the period comprising of pre and post Shah Commission mining ban in Goa effective from September 2012. All other data comprising of agricultural production and yield levels at the state macro level were also segregated in to the two periods mentioned above. This could extract the exact yield and production differentials between the two time periods i.e. the period of full swing mining before the ban and the post Shah Commission mining ban period after Sep. 2012 respectively. Mainly the present study depended on the collection, tabulation, analysis and interpretation of the authentic and relative Primary data that have been obtained from the village farming households respectively from each one Taluk of the North and South Goa namely Bicholim and Sanguem Taluks. Areas with different proximity in mining sites in order to ascertain the proximity specific impacts were selected for this purpose. For example the main Iron Ore bearing zones were divided in to four separate areas viz; 1) Bicholim (*Surla, Velguem, Shirgaon, Asnoda and Advalpale*) from North Goa and, 2) Sanguem (*Rivona*) from South Goa. These five villages respectively three from Bicholim of North Goa and two from Sanguem Taluk of South Goa being in the close proximity of the mining areas with a concentration of the Iron Ore were selected for the collection of the primary data. An equal proportion of the representing households depending on the

number of cultivating households from each of the village belonging to these two Taluks were selected for the purpose of obtaining the authentic and reliable Primary Data. After this stratification of villages located in the close proximities of the mining areas we selected 10 per cent of the households of the agricultural cultivators. This proportion of the sample effectively became 161 households from Bicholim Taluk of North Goa and 43 households from Sanguem of South Goa together making the sample of 204 cultivators' households from these two taluks respectively. All these primary data were obtained through in-person contacts with respondents through a pre-structured questionnaire comprising of sixty questions. Other than the state economic surveys of Goa for years for the collection of rest of the secondary information we used the Annual Economic Surveys of the Government of India, Mines Report of Government of India, Department of Geology and Mines, etc. The data thus collected are analyzed in view of the set of the objectives of the present study and the hypotheses that were aimed at. Basic statistical tools that are usually used in the studies of impact assessment research have been used to arrive at the relevant findings and conclusions, so that the study could take a shape as it was aimed at. The use of basic statistical tools wherever necessary is undertaken. The tools that have been used in the tabulation of the secondary data are; annual growth, CAGR, AVG, CV, STDEV, etc. while percentage calculation and the pre and post mining ban calculation of yield levels, net crop-wise changes in the per acre yields have been ascertained from the primary data. About the health expenditure we have attempted to calculate the disease-wise total expenditure of all households together and the average expenditure for every disease so as to find out the health impacts of the mining in the areas of mining proximity.

## RESULTS AND DISCUSSION

Most of the mining sites in the state are located in close proximity to the agricultural fields hence adversely affecting them by decreasing their cultivations. It led to the depletion of groundwater tables as well as the pollution of the remaining water sources. Heavy road transport and dust caused the river, stream and crop siltation which led to a drastic fall in the crop yield and even at many places the abandonment of cultivation. From the data given in the subsequent tables we find that the pre and post mining ban clearly shows the improvement in the crop yield and even in some cases the area under crops during the post mine ban period has gone up.

**Direct and Indirect Losses due to Mining:** Direct as well as indirect losses have occurred to various individuals in the society due to the implementation of mining ban in the state of Goa. The mine owners lost profits in the absence of iron ore exports, state government of Goa lost huge amount of revenue that it used to receive earlier from royalties levied on mining companies to operate the mines and the loss has been 65 per cent of the original revenue amount that was recovered while mining was in full swing. Employees working on mining sites lost their jobs and other subsidiary activities lost their businesses.

**Sectoral Contribution to the Gross State Domestic Product (GSDP) and Net State Domestic Product (NSDP) of Goa:** Measurement of performance by any state or union territory is depicted through the various economic indicators. Some

important economic indicators are Gross Domestic Product (GDP) termed as Gross State Domestic Product (GSDP) when measured for states performance and the Net Domestic Product (NDP) termed as Net State Domestic Product (NSDP) when measured for states performance.

**Table 1. Pre and Post Mining Ban Area under Different Crops in the State of Goa**

Crops	2010-11	2011-12	2012-13	2013-14
	Area Under Different Crops (Hectare)			
Paddy	46612	47237	45830	42820
Pulses	7550	9949	9949	8100
Groundnut	2885	3194	3108	2591
Vegetable	5880	6498	6645	7004
Sugarcane	921	915	854	872
Cashew	55732	55737	55747	55936
Coconut*	25718	25730	25712	25750

Source: Economic Survey of Goa, Various Issues

**Table 2. Pre and Post Mining Ban Production of Different Crops in the State of Goa**

Crops	2010-11	2011-12	2012-13	2013-14
	Production (Tonnes)			
Paddy	172489	182945	184282	189760
Pulses	7982	8286	8974	8926
Groundnut	8287	8000	7469	6590
Vegetable	60472	78201	80511	79920
Sugarcane	49108	46584	46006	47669
Cashew	23138	23240	23804	24332
Coconut*	128.88	129.28	122.72	128.15

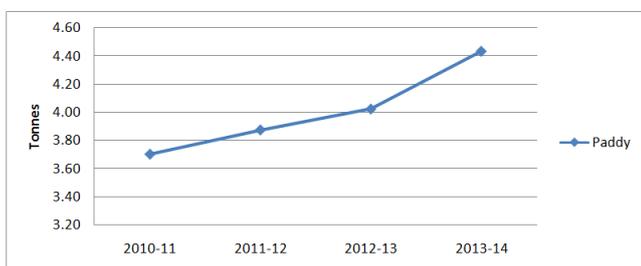
\*Million Nuts

Source: Economic Survey of Goa, Various Issues

**Table 3. Pre and Post Mining Ban Yield Levels of Different Crops in the State of Goa**

Crops	2010-11	2011-12	2012-13	2013-14
	Average Yield (Tonnes / Hectare)			
Paddy	3.70	3.87	4.02	4.43
Pulses	1.06	0.83	0.90	1.10
Groundnut	2.87	2.50	2.40	2.54
Vegetable	10.28	12.03	12.12	11.41
Sugarcane	53.32	50.91	53.87	54.67
Cashew	0.42	0.42	0.43	0.43

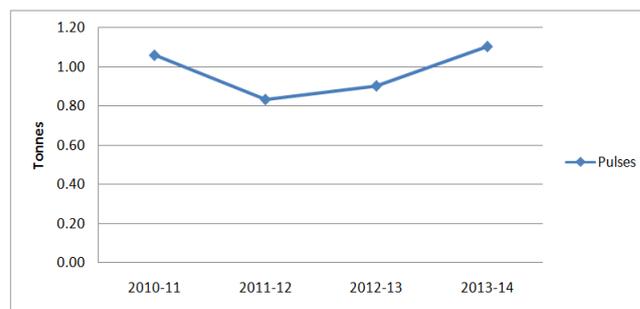
Source: Economic Survey of Goa, Various Issues



Source: Economic Survey of Goa, Various Issues

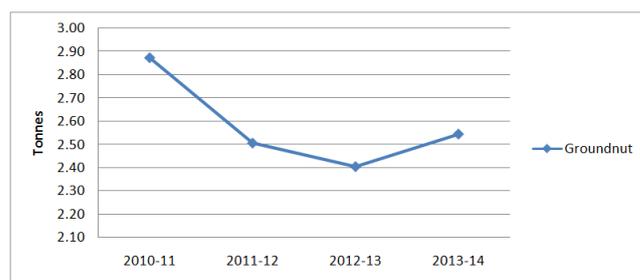
**Figure 1. Pre and Post Mining Productivity Scenario of Paddy in the Agriculture of Goa (Tonnes/Ha)**

In the tables below we have displayed the sector wise percentage distribution of both the Gross State Domestic Product as well as Net State Domestic Product at factor cost by industry of origin both at current as well as constant prices from the time period 2004-05 to 2011-12 in lakh rupees computed by taking 2004-05 as the base year (Table Numbers 4.11 to 4.14).



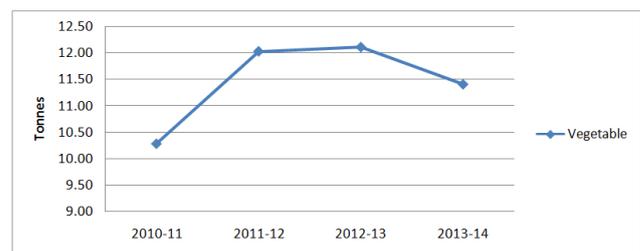
Source: Economic Survey of Goa, Various Issues

**Figure 2. Pre and Post Mining Productivity Scenario of Pulses in the Agriculture of Goa (Tonnes/Ha)**



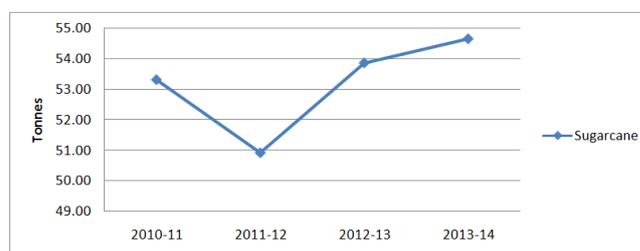
Source: Economic Survey of Goa, Various Issues

**Figure 3. Pre and Post Mining Productivity Scenario of Groundnut in the Agriculture of Goa (Tonnes/Ha)**



Source: Economic Survey of Goa, Various Issues

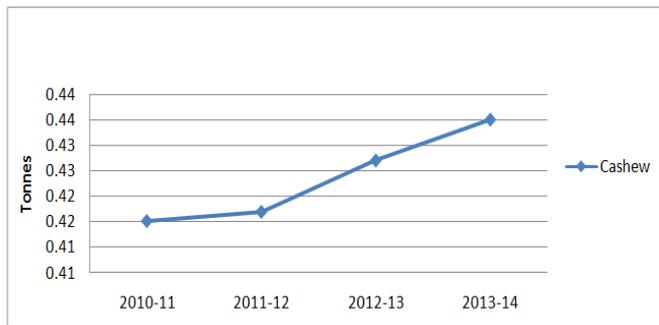
**Figure 4. Pre and Post Mining Productivity Scenario of Vegetables in the Agriculture of Goa (Tonnes/Ha)**



Source: Economic Survey of Goa, Various Issues

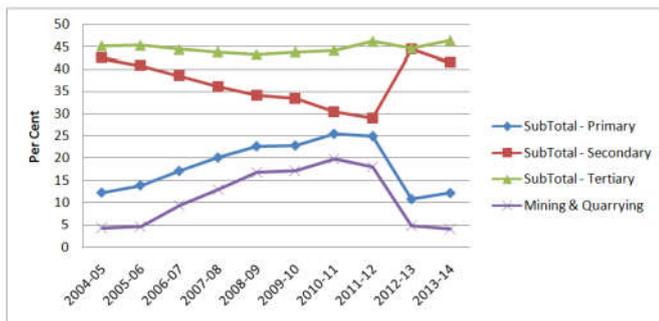
**Figure 5. Pre and Post Mining Productivity Scenario of Sugarcane in the Agriculture of Goa (Tonnes/Ha)**

Also we have displayed the contribution and share of Mining as a percentage of Gross State Domestic Product and Net State Domestic Product at Factor Cost of Goa from the Period 2004-05 to 2013-14 at Current Prices (Rs in Lakh) Base Year 2004-05 (Table Numbers 4.15 to 4.18). Except for Table No. 4.19 which represents the Contribution of Mining to the Gross State Domestic Product at Factor Cost of Goa from the Period 1980-81 to 2013-14 at Current Prices (Rs in Lakh).



Source: Economic Survey of Goa, Various Issues

**Figure 6. Pre and Post Mining Productivity Scenario of Cashew in the Agriculture of Goa (Tonnes/Ha)**



Source: Economic Survey of Goa, Various Issues

**Figure 6. Sectorwise percentage Distribution of Gross State Domestic Product at Factor Cost by Industry of Origin From Period 2004-05 to 2013-14 at Current Prices (Rs In Lakh / Base Year 2004-05)**

The contribution of three sectors (Primary, Secondary and Tertiary) to the state economy of Goa. Data shows that in the primary sector, majority of the contribution comes from Agriculture, Forestry and Fishing fluctuating over time period of 10 years showing a trend of slight increase in the beginning from 7.85 per cent in 2004-05 to 9.24 per cent in 2005-06. The contribution of Agriculture, Forestry and Fishing dropped down to 7.79 per cent in 2006-07 and further to 7.21 per cent in 2007-08. Again, in the year 2008-09 its contribution significantly dropped down to 5.87 per cent before declining it to 5.69 per cent in the year 2009-10. It very marginally managed to increase to 5.70 per cent in 2010-11 and finally reached at 6.90 per cent in 2011-12. Again the fall was witnessed in the year 2012-13 to 6.02 per cent followed by a sharp rise in its contribution to 8.01 per cent in 2013-14. Thus it can be said that the share contributed by Agriculture, Forestry and Fishing to the state GSDP of Goa remained at 7.03 per cent on an average. It may be noted that individual contributions are equally important of the sub-sectors that depicts that Agriculture contributed the majority of the share to the GSDP of the state followed by Fishing and Forestry and Logging. Hence, agriculture remains the main thrust area that is contributing to the primary sector although its share in the total National Income of the country has come down to less than 14 per cent. Agriculture is the major contributing sector to the primary sector. It started out its task with the contribution of 5.21 per cent in the year 2004-05, increasing it slowly to 5.87 per cent in the year 2005-06. The contribution of agriculture shockingly declined to 4.61 per in the year 2006-07 and marginally slowed down to 4.32 per cent in the year 2007-08. This trend of decreasing contribution continued and it gave 3.56 per cent in the year 2008-09. The presence of the vast

problems to the state farmers further pushed the contribution of agriculture to 3.26 per in the year 2009-10. Agricultural sector continued to contribute the same with 3.22 per cent contribution in 2010-11. Finally shows the signs of slight recovery with contribution of 4.14 per cent in the year 2011-12. Again a decline occurred in its contribution to 3.21 per cent in 2012-13 and slight rise also took place to 3.74 per cent in the year 2013-14. Fishing as a sub-sector which falls under agriculture is the next highest contributor that initiated contribution of 2.04 per cent in 2004-05, and slowly increased it to 2.81 per cent in 2005-06. The contribution of fishing declined down to 2.37 per cent in 2006-07 while the same further fell to 2.21 per cent in 2007-08. The year 2008-09 witnessed a fall in contribution of fishing below 2 per cent (reaching 1.70 per cent) and 2009-10 saw a more fall in the contribution of fishing to 1.61 per cent respectively. Significant fall in the contribution of fishing occurred in the year 2010-11 when it contributed 1.46 per cent the lowest contribution to the state economy and in the following year of 2011-12 its contribution slightly peaked up to 1.81 per cent. Followed by further rise to 1.92 per cent in 2012-13 and major rise in its contribution was witnessed in the year 2013-14.

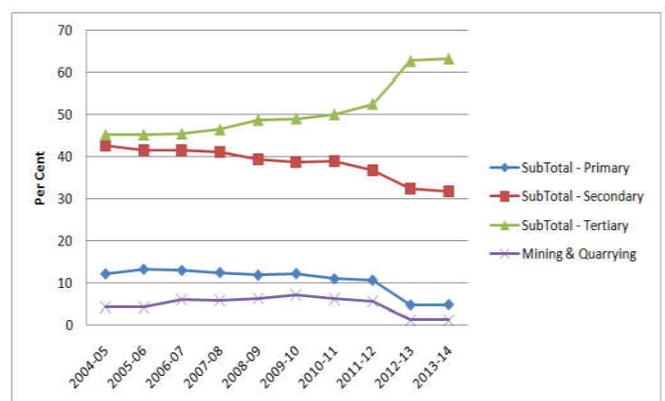
Another sub-sector Forestry and Logging under agriculture is the lowest contributing sector to the state economy of Goa with less than 1 per cent for the entire time period. Its initial contribution started with 0.61 per cent in the year 2004-05, maintaining almost the same level of contributions in the year 2005-06 with 0.56 per cent. In the next year however it contributed slightly more than 0.80 per cent in 2006-07. But again the fall in its contribution continued with 0.68 per cent in 2007-08 and to 0.61 per cent in the next year of 2008-09. The role of the sector again increased marginally with its contribution of 0.82 per cent in 2009-10. Surprisingly, in 2010-11 it contributed 1.01 per cent and again showed the same fall in its contribution to 0.94 per cent in 2011-12. With 0.89 per cent contribution in 2012-13 the Forestry and Logging showed a decline and it again increased to 1.67 per cent in terms of its contribution to the GSDP of Goa in 2013-14. The second sub-sector Mining and Quarrying contributed 4.42 per cent to the Gross State Domestic Product during the year 2004-05. Here too as seen earlier slight rise took place and it contributed 4.67 per cent in the year 2005-06. Major mining activity led to increased revenue to mining companies and subsequent increase in contribution to state of 9.36 per cent in the year 2006-07. This increased contribution to increase slowly to 12.94 per cent in the year 2007-08. Thus in the following years increase in contribution by this sector took place with 16.84 per cent in the year 2008-09, 17.18 per cent in the year 2009-10, 19.80 per cent in 2010-11 and a slight decrease with contribution as opposed to earlier of 18.06 per cent to the state GSDP in the year 2011-12. Drastical reduction in its contribution was witnessed following the mining ban bringing down its contribution to 4.8 per cent in 2012-13 and to 4.16 per cent in 2013-14 respectively.

Primary sector as major and a crucial component of the economy of Goa all levels contributed 12.27 per cent during the year 2004-05. In 2005-06 it began to increase its contribution steadily but slowly to 13.91 per cent in 2005-06. This jumped up to 17.15 per cent in the year 2006-07. In 2007-08 the contribution of primary sector to the state GSDP almost doubled its initial start-up contribution with 20.15 per cent. Primary sector did not lose up on this and again contributed

22.70 per cent in 2008-09. But this rise slowed down drastically in the year 2009-10 with contribution of 22.87 per. An increase to 25.49 per cent was witnessed in the year 2010-11 and again a small decline took place in the year 2011-12 by its share of 24.96 per cent. More than half of the decrease was witnessed in 2012-13 to 10.82 per cent and slight rise took place in the year 2013-14 which was 12.17 per cent. Industrialization propelled the secondary sector with a rise in manufacturing to be the dominant and major dependent sector for growth in the industrial arena to progress heavily. Manufacturing contributed 29.96 per cent in the year 2004-05. But the growth slowed down and so the contribution to 29.17 per cent in the year 2005-06. Decline in growth continued to 28.01 per cent in the year 2006-07 also. It is interesting to note that this decrease in growth took place for the succeeding years of 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12 respectively. During this we see that the manufacturing sector contributed 25.92 per, 24.64 per cent, 24.60 per cent, 21.67 per cent and 20.35 per cent respectively. Major rise to 34.87 per cent was witnessed in 2012-13 and slight fall to 31.82 per cent was seen in the year 2013-14. Registered Manufacturing within the scope of manufacturing turned out to be the dominant sub-sector by contributing 26.09 per cent to the state GSDP in the year 2004-05, following the manufacturing sector's trend slowdown was also witnessed to 25.24 per cent in 2005-06. Considering these the decrease in contribution continued with 23.87 per cent in the year 2006-07. Almost 5 per cent decline from the original contribution was depicted to 21.76 per cent in 2007-08, followed by 21.16 per cent in 2008-09. However in between a slight rise occurred like that of 21.40 per cent in the year 2009-10. Depression in manufacturing continued with 18.75 per cent contribution in the year 2010-11 and succeeding 17.52 per cent in the year 2011-12. In 2012-13 contribution rose up to 31.9 per cent and again fell to 28.65 per cent in 2013-14.

Unregistered Manufacturing contributed much less than the registered manufacturing with 3.87 per cent as the opening contribution during the year 2004-05. Rise to 3.93 per cent took place in the year 2005-06. This signs of improved contribution of the sector also continued with its contribution of 4.14 per cent in 2006-07. Almost the same contribution continued with 4.16 per cent in during the year 2007-08. Downfall started with its contribution of 3.48 per cent in 2008-09. No improvement took place in the year 2009-10 which depicted through the contribution of 3.21 per cent to the state GSDP, 2.91 per cent contribution in 2010-11 and 2.83 per cent contribution in 2011-12 justified the fall. In 2012-13 contribution increased to 2.98 per cent and 3.17 per cent in the year 2013-14. Construction another sub-sector contributed 10.33 per cent to start with in the year 2004-05 showing a fluctuating trend in its contributions within the range of 9 to 6 per cent spread over these years up to 2011-12, and highest contribution of 3.31 per cent in the year 2013-14. Electricity, Gas and Water Supply yet another sub-sector showed a trend of contribution ranging from 2.26 per cent to 6.34 per cent from 2004-05 to 2013-14 showing a marginal contribution of only about 4 per cent fluctuations. Secondary sector in total contributed on an average 35.21 per cent with varying contributions from other sectors. Tertiary sector consists of different types of activities such as the Trade, Hotels and Restaurant that contributed 12.29 per cent in the year 2004-05 and ended up to 11.95 per in 2013-14 with a volatile fluctuations in between these eight years that boosted and

brought down at the same time its contribution to the state economy. Transport, Storage and Communication went ahead marginally contributing 14.17 per cent in the year 2004-05 to 13.16 per cent to the Gross State Domestic Product of Goa during the year 2013-14. This however is interesting because it's fall in contribution continued for initial phase of four years from 2005-06 to 2008-09, but again it rose to 13 per cent in the year 2009-10. Railways portrays the worst contributing sector with less than 1 per cent starting from 0.40 per cent in the year 2004-05 to 0.30 per cent in the year 2013-14. There have been no startling fluctuations in this sub-sector but just a small rise and fall have occurred in the contribution of this sector. Transport by other means however looked promising in terms of its contribution from 12.39 per cent in 2004-05 to 11.73 per cent in the year 2013-14. But this sub-sector also moved around 11 per cent only and did not jump up as expected in its contribution to entire tertiary sector. Storage except 0.01 per cent in 2009-10 does not give any contribution. Communication contributed 1.37 per cent in 2004-05 to 1.13 per cent in the year 2013-14. Financing, Insurance, Real Estate and Business Services proved to be major contributor with 11.32 per cent in the year 2004-05 that over eight years' time period came down to 10.68 per cent in the year 2013-14. Fluctuations were in the range of 10 to 9 per cent in its average contribution. With contributions from Banking and Insurance 5 to 4.68 per cent on average in 2004-05 to 2013-14. Real Estate, Ownership of Dwellings and Business Services contributed 5.95 per cent in the year 2004-05 to 6 per cent to the Gross State Domestic Product of Goa during the year 2013-14. It maintains of almost 5 per cent average contribution to the state. Community, Social and Personal Services yet another sub-sector contributed 7.42 per cent in the year 2004-05 and 10.58 per cent in the year 2013-14. Range of eight per cent average fluctuation was witnessed over the time period. Public Administration and Other services contributed of around 3 per cent and 4 per cent respectively with small but important contributions to the tertiary sector. Entirely considering the role of all three sectors the tertiary sector contributed the most to the state economy with contributions ranging from 45.19 per cent in the year 2004-05, 45.29 per cent in the year 2005-06, 44.40 per cent in the year 2006-07 and 43.84 per cent in the year 2007-08 respectively. In 2008-09 its contribution declined slightly to 43.28 per cent. Slight increase was again occurred in the year 2009-10 with 43.84 per cent.



Source: Economic Survey of Goa, Various Issues

**Figure 7. Sectorwise Percentage Distribution of Gross State Domestic Product at Factor Cost by Industry of Origin From Period 2004-05 to 2013-14 at Constant Prices (Rs in Lakh / Base year 2004-05)**

Thus in 2010-11 and 2011-12 contributions of 44.21 per cent and 46.18 per cent were witnessed showing a rise by almost 1 per cent every year. In 2013-14 the contribution of 46.37 per cent showed again a slight boost. Percentage distribution of Gross State Domestic Product at factor cost by industry of origin from the time period 2004-05 to 2013-14 at Constant Prices in lakh rupees computed by taking 2004-05 as the base year. The contribution of three sectors (Primary, Secondary and Tertiary) to the state economy of Goa can be seen clearly. Data shows that in the primary sector majority of the contribution comes from Agriculture, Forestry and Fishing fluctuating over time period of 10 years showing a trend of slight increase in the beginning from 7.85 per cent in 2004-05 to 9.02 per cent in 2005-06. The contribution of Agriculture, Forestry and Fishing dropped down to 6.89 per cent in 2006-07 and further to 6.63 per cent in 2007-08. Again, in the year 2008-09 its contribution significantly dropped down to 5.58 per cent before declining it to 5.11 per cent in the year 2009-10. It very marginally decreased to 4.79 per cent in 2010-11 and showed a minute increase to 5.04 per cent in 2011-12. Again the fall was witnessed in the year 2012-13 to 3.44 per cent followed by a small rise in its contribution to 3.63 per cent in 2013-14. Thus it can be noted that the share contributed by Agriculture, Forestry and Fishing to the state GSDP of Goa was 2 per cent on an average.

The individual contributions of the subsectors are equally vital that depicts that Agriculture contributed the majority of the share to the GSDP of the state followed by Fishing and Forestry and Logging. Hence, agriculture remains the predominant thrust area that is contributing to the primary sector although its share in the National Income of India has come down less than 14 per cent. Agriculture remains the major contributing sector to the entire primary sector of the state of Goa. It started out its task with the contribution of 5.21 per cent in the year 2004-05, increased slowly to 6.07 per cent in the year 2005-06. The contribution of agriculture shockingly declined to 4.33 per cent in the year 2006-07 and further but marginally slowed down to 4.32 per cent in the year 2007-08. This trend of decreasing contribution of agriculture continued and it gave 3.52 per cent in the year 2008-09. The problems faced by the state farmers further pushed the contribution of agriculture down to 3.24 per cent in the year 2009-10. Agricultural sector continued to contribute further less with 3.06 per cent in 2010-11. Finally shows the signs of slight recovery with contribution of 3.52 per cent in the year 2011-12. Again a decline occurred in its contribution to 2.19 per cent in 2012-13 and a slight fall also took place in the year 2013-14 which was 2.13 per cent.

In a coastal state like Goa fishing as a sub-sector under agriculture is the predominant contributor that initiated the contribution of 2.04 per cent in 2004-05 which slowly increased to 2.38 per cent in 2005-06. The contribution of fishing declined down to 2.04 per cent in 2006-07 whereas the same further fell to 1.8 per cent in 2007-08. The year 2008-09 witnessed a fall in contribution of fishing below 2 per cent (reaching 1.55 per cent) and 2009-10 saw more fall in the contribution of fishing to 1.43 per cent. Significant fall in the contribution of fishing occurred in the year 2010-11 when it contributed 1.32 per cent the lowest contribution to the state economy of Goa and in the subsequent year of 2011-12 its contribution fell to 1.14 per cent. Followed by worst its contribution of 0.87 per cent in 2012-13 and minor rise in its

contribution was witnessed in the year 2013-14 which was 1.12 per cent. Forestry and Logging clubbed under agriculture happens to be the lowest contributing sector to the state economy with less than 1 per cent for the entire time period. Its initial contribution started with 0.61 per cent in the year 2004-05, maintaining the same level of contributions in the year 2005-06 with 0.57 per cent. During the next year however it contributed slightly more that is 0.52 per cent in 2006-07. But again the fall in its contribution continued with 0.50 per cent in 2007-08 and to 0.51 in the next year 2008-09. The role of the sector again increased marginally with its contribution of 0.45 per cent in 2009-10. Surprisingly, in 2010-11 it contributed 0.41 per cent and again showed the same fall in its contribution of 0.38 per cent in 2011-12. With 0.37 per cent contribution in 2012-13 the Forestry and Logging showed a decline and it again increased to 0.38 per cent in terms of its contribution to the GSDP in 2013-14.

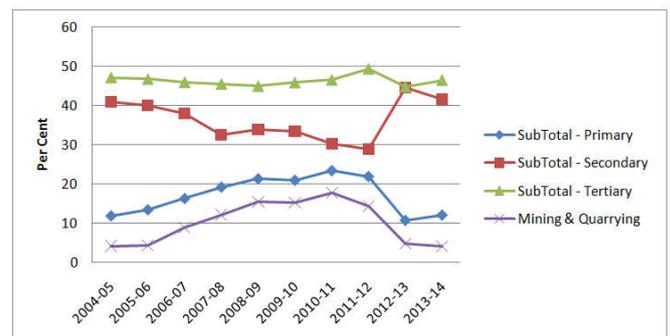
Another sub-sector Mining and Quarrying contributed 4.42 per cent to the Gross State Domestic Product during the year 2004-05. Here too as has been seen earlier slight rise took place and it contributed 4.35 per cent in the year 2005-06. Major mining activity led to an increased revenue to mining companies and subsequent increase in contribution to state of 6.21 per cent in the year 2006-07. This increased contribution continued to increase slowly to 5.97 per cent in the year 2007-08. Thus in the following years increase in contribution of this sector took place with 6.39 per cent in the year 2008-09, 7.23 per cent in the year 2009-10, 6.3 per cent in 2010-11 and a slight decrease with contribution as opposed to earlier of 5.71 per cent to the state in the year 2011-12. A sharp reduction in its contribution was witnessed during the post mining ban bringing down its contribution to 1.4 per cent in 2012-13 and to 1.3 per cent in 2013-14. Primary sector as major and crucial component of the economy of Goa at all levels contributed 12.27 per cent during the year 2004-05. In 2005-06 it started increasing its contribution steadily but slowly to 13.37 per cent in 2005-06. There was a decline in the contribution to 13.09 per cent in the year 2006-07. In 2007-08 the contribution of primary sector again fell to 12.59 per cent. Primary sector further suffered losses and had contributed 11.97 per cent in 2008-09. But this rise slowly occurred in the year 2009-10 with contribution of 12.33 per cent. A decrease to 11.09 per cent was witnessed in the year 2010-11 and again a small decline took place in the year 2011-12 by contributing 10.75 per cent. More than half the decrease was witnessed in 2012-13 to 4.83 per cent and slight rise took place in the year 2013-14 to 4.93 per cent.

State industrialization propelled the secondary sector with manufacturing rising to be the dominant and major sector for the growth in the industrial arena to progress heavily. Manufacturing contributed 29.96 per cent in the year 2004-05. But the growth slowed down and so the contribution to 29.30 per cent in the year 2005-06. Decline in growth continued with the contribution of 29.39 per cent in the year 2006-07 also. It is interesting to note that this decrease in growth took place for the succeeding years of 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12 respectively. During this period we see that the manufacturing sector contributed 28.83 per cent, 27.69 per cent, 27.28 per cent, 26.18 per cent and 24.29 per cent respectively. Major fall with the contribution of 21.11 per cent in 2012-13 and a further fall to 20.28 per cent was seen in the year 2013-14. Registered Manufacturing within the scope of

manufacturing turned out to be the dominant sub-sector of the state of Goa by contributing 26.09 per cent to the state GDP in the year 2004-05, the manufacturing sector's trend slowed down to 25.43 per cent in 2005-06. Considering these the decrease in contribution continued with 25.36 per cent in the year 2006-07. Almost 5 per cent decline from the original contribution was depicted to 24.50 per cent in 2007-08 which was followed by 23.72 per cent in 2008-09. However in between slight rises occurred which is seen through the contribution of 23.52 per cent in the year 2009-10. Depression in manufacturing continued with 22.73 per cent contribution to the GSDP in the year 2010-11 and succeeding 21.52 per cent in the year 2011-12. In 2012-13 contribution rose up to 18.2 per cent and again fell to 17.32 per cent in 2013-14. Another subset of the manufacturing sector is the Unregistered Manufacturing which contributed much less than the registered manufacturing with 3.87 per cent as the opening contribution to the GSDP during the year 2004-05. It rose to 3.88 per cent in the year 2005-06. This signs of improved contribution also continued with its contribution of 4.03 per cent in 2006-07. Almost the same contribution continued with 4.33 per cent in during the year 2007-08. Downfall started with the contribution of 3.98 per cent in 2008-09. No improvement took place in the year 2009-10 which is depicted through the contribution of 3.76 per cent to the state, 3.45 per cent contribution in 2010-11 and 2.77 per cent contribution in 2011-12 justified the fall. In 2012-13 contribution of the unregistered manufacturing increased to 2.91 per cent and further to 2.96 per cent in the year 2013-14.

In recent times Construction has emerged as another sub-sector contributed 10.33 per cent to start with in the year 2004-05 showing fluctuating contributions within the range of 9 to 6 per cent spread over the years up to 2011-12, and lowest contribution of 1.62 per cent was seen in 2013-14. Electricity, Gas and Water Supply yet another sub-sector showed the trend ranging from 2.26 per cent in 2004-05 to 9.96 per cent in 2013-14 showing a rise in contribution. Secondary sector in total contributed on an average 39 per cent with varying contributions from other sectors. During the post liberalization the services sector across the world has emerged as the dominant sector. Tertiary sector consists of different types of activities such as Trade, Hotels and Restaurant that contributed 12.29 per cent in the year 2004-05 and ended up to 8.9 per cent in 2013-14 with a volatile fluctuations in between the period of 10 years that boosted and brought down at the same time its contribution to the state economy. Transport, Storage and Communication went ahead marginally contributing 14.17 per cent in the year 2004-05 to 31.49 per cent to the Gross State Domestic Product of Goa during the year 2013-14. This however is noteworthy because it's fall in contribution continued for the initial phase of four years from 2005-06 to 2008-09, but again it rose to 13 per cent in 2009-10. The state of Goa does not have a very long stretch of railway network. Railways portrays the worst contributing sector with less than 1 per cent starting from 0.40 per cent in the year 2004-05 to 0.31 per cent in the year 2013-14. There have been no startling fluctuations in this sub-sector but just a small rise and fall have occurred in the contribution of this sector. Road Transport by other means however looked a promising in terms of its contribution from 12.39 per cent in 2004-05 to 29.25 per cent in the year 2013-14. Storage except 0.02 per cent in 2009-10 didn't have any role in the GSDP of Goa. Communication contributed 1.37 per cent in 2004-05 and 1.91 per cent in the

year 2013-14. In the tertiary sector Financing, Insurance, Real Estate and Business Services proved to be major contributor with 11.32 per cent in the year 2004-05 that over 8 years' time period came down to 13.19 per cent in the year 2013-14. Fluctuations remained in the range of 10 to 9 per cent of average contribution. Contributions from Banking & Insurance remained at 5.37 per cent on an average in 2004-05 to 6.91 per cent in 2013-14. Real Estate, Ownership of Dwellings and Business Services contributed 5.95 per cent in the year 2004-05 to 6.29 per cent to the Gross State Domestic Product during the year 2013-14. Community, Social and Personal Services is yet another sub-sector which contributed 7.42 per cent in the year 2004-05 and 9.63 per cent in the year 2013-14. Range of 8 per cent average fluctuation was witnessed over the time period. Public Administration and Other services contributed of around 3 per cent and 4 to 5 per cent respectively with a small but important contribution to the tertiary sector. Considering role of all three sectors the tertiary sector which contributed the most to the state economy of Goa with contributions ranging from 45.19 per cent in the year 2004-05, 45.17 per cent in the year 2005-06, 45.40 per cent in the year 2006-07 and 46.41 per cent in the year 2007-08 respectively. In 2008-09 its contribution was 48.64 per cent. Slight increase again occurred in the year 2009-10 with 48.99 per cent. Thus in 2010-11 and 2011-12 contributions of 49.99 per cent and 52.50 per cent were witnessed showing a rise by almost 1 per cent every year. In 2013-14 contribution of 63.21 per cent showed again slight boost in its contribution.



Source: Economic Survey of Goa, Various Issues

**Figure 8. Sector wise Percentage Distribution of Net State Domestic Product at Factor Cost by Industry of Origin from Period 2004-05 to 2013-14 at Current Prices (Rs In Lakh / Base Year 2004-05)**

Sector wise percentage distribution of Net State Domestic Product of Goa at factor cost by industry of origin covering the time period from 2004-05 to 2013-14 at Current Prices in lakh rupees which is computed by taking 2004-05 as the base year. The above table shows the contribution of three sectors (Primary, Secondary and Tertiary) to the state economy of Goa which can be seen clearly. Data shows that in the primary sector on the line of GSDP also the majority of the contribution comes from Agriculture, Forestry and Fishing fluctuating over time period of 10 years showing a trend of slight increase in the beginning from 7.70 per cent in 2004-05 to 9.10 per cent in 2005-06. The contribution of Agriculture, Forestry and Fishing decreased to 7.57 per cent in 2006-07 and further to 7.11 per cent in 2007-08. Again, in the year 2008-09 the contribution of the primary sector significantly dropped down to 5.95 per cent before declining it further to 5.76 per cent in the year 2009-10. Marginally it decreased to 5.79 per

cent in 2010-11 and showed a minute increase to 7.25 per cent in 2011-12. Again the fall returned in the year 2012-13 to 6.02 per cent followed by a small rise in its contribution of 8.01 per cent in 2013-14. Thus it can be said that the share contributed by Agriculture, Forestry and Fishing to the state GSDP of Goa was 2 per cent on an average. The individual contributions to each sector are equally important of the sub-sectors that depicts that Agriculture contributed the majority of the share to the GSDP of the state followed by Fishing and Forestry and Logging respectively. Hence, agriculture remains the main thrust area that is contributing to the primary sector although it's share in the total National Income of many countries and of India has come down less than 14 per cent.

In the state of Goa also the agriculture is the major contributing sector to the primary sector of the state. It started out its task with the contribution of 4.96 per cent in the year 2004-05, increased to 5.64 per cent in the year 2005-06. The contribution of agriculture shockingly declined to 4.28 per cent in the year 2006-07 and marginally slowed down to 4.12 per cent in the year 2007-08. This trend of decreasing contribution continued and it gave 3.59 per cent in the year 2008-09. The distressed situation further pushed the contribution of agriculture to 3.25 per cent in the year 2009-10. The sector continued to contribute further less with 3.21 per cent in 2010-11. Finally shows the signs of slight recovery with its contribution of 4.32 per cent in the year 2011-12. Again a decline occurred in its contribution to 3.21 per cent in 2012-13 and a slight fall also took place to 3.74 per cent in the year 2013-14. Goa is a coastal state therefore, fishing as a sub-sector under agriculture is obvious to become the next highest contributor that initiated contribution of 2.05 per cent in 2004-05 which slowly increased to 2.82 per cent in 2005-06. The contribution of fishing declined to 2.39 per cent in 2006-07 while the same further fell to 2.22 per cent in 2007-08. The year 2008-09 witnessed a fall in contribution of fishing below 2 per cent (reaching 1.68 per cent) and in the year 2009-10 saw more fall in the contribution of fishing to 1.58 per cent. Significant fall in the fishing contribution occurred in the year 2010-11 when it contributed 1.41 per cent which was the lowest contribution to the state economy and in the subsequent year of 2011-12 its contribution declined further which was 1.84 per cent. Followed by worst contribution of 1.92 per cent in 2012-13 and minor rise in its contribution was witnessed in the year 2013-14 to 3.1 per cent respectively.

Another sub-sector of the economy of the state of Goa is vital which is Forestry and Logging under agriculture remains the lowest contributing sector to the state economy with less than 1 per cent for the entire time period of this study. Its initial contribution started with 0.69 per cent in the year 2004-05, maintaining the same low level of contributions in the year 2005-06 with 0.64 per cent. In the next year however it contributed slightly more that is 0.91 per cent in 2006-07. But again the fall in the contribution continued with 0.77 per cent in 2007-08 and to 0.69 in the next year 2008-09. The contribution of the sector again increased but marginally with its contribution of 0.93 per cent in 2009-10. Surprisingly, in 2010-11 it contributed 1.16 per cent and again showed the same fall in its contribution to 1.09 per cent in 2011-12. With 0.89 per cent contribution in 2012-13 the Forestry and Logging showed a decline and it again increased to 1.67 per cent in terms of its contribution in 2013-14. The second sub-sector of the state economy of Goa is Mining and Quarrying

which contributed 4.26 per cent to the Net State Domestic Product during the year 2004-05. Here too as seen earlier a slight rise took place and it contributed 4.41 per cent in the year 2005-06. Major mining activity led to increased revenue to mining companies and subsequent increase in contribution to state economy of 8.79 per cent in the year 2006-07. This increased contribution further increased to 12.13 per cent in the year 2007-08. Thus in the following years increase in contribution took place with 15.41 per cent in 2008-09, 15.24 per cent in the year 2009-10, 17.64 per cent in 2010-11 and a slight decrease with contribution as opposed to earlier of 14.2 per cent to the state economy of Goa in the year 2011-12. Drastic reduction in the contribution of this sector was witnessed following the mining ban which brought down its contribution to 4.80 per cent in 2012-13 and further to 4.16 per cent in 2013-14.

Primary sector as the major crucial component of the economy of the state at all levels contributed 11.96 per cent during the year 2004-05. In 2005-06 it began increasing its contribution steadily but slowly to 13.51 per cent in 2005-06. Increased its contribution little bit to 16.36 per cent in the year 2006-07. In 2007-08 the contribution of primary sector shot up to 19.24 per cent. Primary sector further suffered losses and contributed 21.37 per cent in 2008-09. But this rise slowly occurred in the year 2009-10 with its contribution of 21 per cent. An increase to 23.43 per cent was witnessed in the year 2010-11 and again a small decline took place in the year 2011-12 by contributing 21.95 per cent. More than half decrease was witnessed in 2012-13 which was 10.82 per cent which was a sudden shock and slight rise took place in the year 2013-14 to 12.17 per cent. Industrialization propelled the secondary sector of the state economy of Goa with manufacturing rising to be the dominant and major dependent sector for growth in the industrial arena to progress heavily. This sector contributed 28.28 per cent in the year 2004-05. But the growth slowed down and so the contribution also declined to 28.23 per cent in the year 2005-06. Decline in growth and thereby the contribution continued to 27.41 per cent in the year 2006-07 also. It is interesting to note that this decrease in growth took place for the succeeding years of 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12. During this period we see that the manufacturing sector contributed 25.43 per cent, 24.37 per cent, 24.41 per cent, 21.12 per cent and 19.68 per cent respectively. Major increase up to 34.87 per cent in 2012-13 was seen and slight fall to 31.82 per cent was experienced in the year 2013-14.

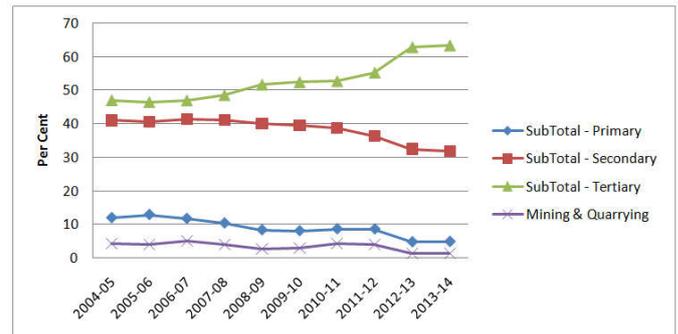
Registered Manufacturing within the scope of manufacturing turned out to be the dominant sub-sector of the state economy of Goa by contributing 24.29 per cent to the state in the year 2004-05, following the manufacturing sector's trend slowdown was also witnessed to 24.21 per cent in 2005-06. Considering these the decrease in contribution continued with 23.14 per cent in the year 2006-07. Almost 1.07 per cent decline from the earlier contribution. It was depicted to 21.10 per cent in 2007-08, followed by 20.75 per cent in 2008-09. However in between slight rises occurred like that of 21.08 per cent in the year 2009-10. Depression in manufacturing continued with 18.11 per cent contribution in the year 2010-11 and subsequently 16.72 per cent in the year 2011-12. In 2012-13 contribution of the manufacturing sector rose up to 31.9 per cent and again fell to 28.65 per cent in 2013-14. Unregistered Manufacturing is another subset of industry which contributed much less than the registered manufacturing with 3.99 per cent

as the opening contribution during the year 2004-05. It rose to 4.02 per cent in the year 2005-06. Such signs of improved contribution also continued with contribution of 4.27 per cent in 2006-07. Almost the same contribution of unregistered industry continued with 4.33 per cent during the year 2007-08. Downfall started with contribution of 3.62 per cent in 2008-09. No improvement took place in the year 2009-10 which is depicted through the contribution of 3.33 per cent to the state economy, 3.02 per cent contribution in 2010-11 and 2.96 per cent contribution in 2011-12 brings out the fall. In 2012-13 contribution increased to 2.98 per cent and 3.17 per cent in the year 2013-14 respectively.

Goa is one such Indian state which has witnessed a high rate of migration in the recent past. Therefore the construction becomes another sub-sector which contributed 11.47 per cent to start with in the year 2004-05 showing fluctuating contributions within the range of 9 to 6 per cent spread over the years of our study up to 2011-12, and low contribution of 3.31 per cent in 2013-14. Electricity, Gas and Water Supply yet another sub-sector showed its trend of contribution ranging from 1.22 per cent in 2004-05 to 6.34 per cent in 2013-14. Secondary sector on an average contributed 37 per cent with varying contributions from other sectors. Tertiary sector consists of different types of activities such as the Trade, Hotels and Restaurant that contributed 13.63 per cent in the year 2004-05 and ended with 11.95 per cent in 2013-14 with volatile fluctuations in between these 10 years that boosted and brought down at the same time its contribution to the state economy. Transport, Storage and Communication went ahead marginally with contributing 13.83 per cent to the Net State Domestic Product in the year 2004-05 to 13.16 per cent during the year 2013-14. This however is interesting to note because it's fall in contribution continued for initial phase of 4 years from 2005-06 to 2008-09, but again rose to 13 per cent in the year 2009-10. As noted in foregoing that the state of Goa being the smallest state in the country it also does not have a very long stretch of railway network. Therefore railways portrays the contributing sector with less than 1 per cent starting from 0.32 per cent in the year 2004-05 to 0.30 per cent in the year 2013-14 to the NSDP of Goa. There have been no startling fluctuations in this sub-sector but just a small rise or fall have occurred in the contribution of this sector. Road Transport by other means however looked promising in terms of its contribution from 12.18 per cent in 2004-05 to 11.73 per cent in the year 2013-14. Storage except 0.01 per cent in 2009-10 has shown no contribution. Communication contributed 1.33 per cent in 2004-05 and 1.13 per cent in the year 2013-14. Financing, Insurance, Real Estate and Business Services proved to be the major contributor with 12.14 per cent in the year 2004-05. Over 10 years' time period the contribution came down to 10.68 per cent in the year 2013-14. Fluctuations remained in the range of 10 to 9 per cent.

While the contributions from Banking and Insurance sector has been 6.09 per cent in 2004-05 and 4.68 per cent in 2013-14 the Real Estate, Ownership of Dwellings and Business Services contributed 6.05 per cent in the year 2004-05 and 6 per cent to the Gross State Domestic Product during the year 2013-14. Community, Social and Personal Services is of the state economy of Goa which contributed 7.46 per cent in the year 2004-05 and 10.58 per cent in the year 2013-14. Range of 8 per cent average fluctuation was witnessed over the time period. Public Administration and Other services contributed

around 3 per cent and 4 per cent respectively with a small but important contribution to the tertiary sector. Considering the role of all three sectors the tertiary sector contributed the most to the state economy with contributions ranging from 47.06 per cent in 2004-05, 46.62 per cent in 2005-06, 45.80 per cent in 2006-07 and 45.38 per cent in 2007-08 respectively. In 2008-09 its contribution declined slightly to 44.82 per cent. Slight increase again occurred in the year 2009-10 with its contribution of 45.70 per cent. Thus in 2010-11 and 2011-12 contributions of 46.42 per cent and 49.25 per cent were witnessed showing a rise by almost 1 per cent every year. In 2013-14 the contribution was 46.37 per cent which showed a slight boost in its contribution.



Source: Economic Survey of Goa, Various Issues

**Figure 9. Sector wise Percentage Distribution of Net State Domestic Product at Factor Cost by Industry of Origin from Period 2004-05 to 2013-14 at Constant Prices (Rs In Lakh / Base Year 2004-05)**

Sector wise percentage distribution of Net State Domestic Product at factor cost by industry of origin from the time period 2004-05 to 2013-14 at Constant Prices in lakh rupees computed by taking 2004-05 as the base year. Data in the above table show the contributions of three sectors (Primary, Secondary and Tertiary) to the state economy of Goa which can be seen clearly. Data show that in the primary sector majority of the contribution comes from Agriculture, Forestry and Fishing fluctuating over time period of 10 years of the present study showing a trend of slight increase in the beginning showing a trend of slight increase in the beginning from 7.70 per cent in 2004-05 to 8.84 per cent in 2005-06. The contribution of Agriculture, Forestry and Fishing to the state economy of Goa dropped down to 6.54 per cent in the year 2006-07 and further to 6.42 per cent in 2007-08. Again, in the year 2008-09 the contribution of this sector significantly dropped down to 5.69 per cent before declining it to 5.17 per cent in the year 2009-10. It very marginally decreased to 4.29 per cent in 2010-11 and showed a minute increase to 4.65 per cent in 2011-12. Again the fall in contribution was witnessed in the year 2012-13 which was 3.44 per cent followed by a small rise in contribution of 3.63 per cent in 2013-14. Thus it can be said that the share contributed by Agriculture, Forestry and Fishing to the state NSDP was 2 per cent on an average. It may be noted that individual contributions of the subsectors are equally important that depicts that the Agriculture contributed the majority of the share to the NSDP of the state followed by Fishing and Forestry and Logging. Hence, agriculture predominantly remains the thrust area that is contributing to the primary sector of Goa although its share in the total National Income of the India in recent past has come down to less than 14 per cent.

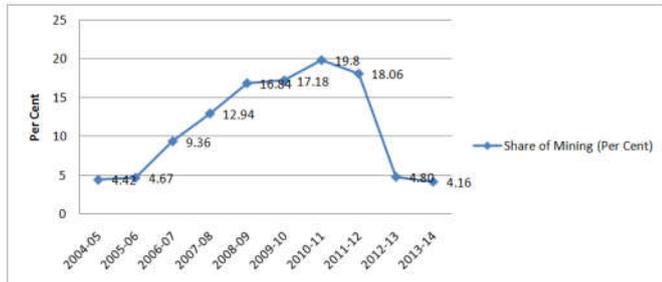
Agriculture remains the major contributing sector to the primary sector of Goa. It started out its task with the contribution of 4.96 per cent in the year 2004-05, increasing slowly to 5.87 per cent in the year 2005-06. The contribution of agriculture shockingly declined to 3.97 per cent in the year 2006-07 and marginally pushed up to 4.14 per cent in the year 2007-08. This trend of decreasing contribution of agriculture continued and it gave 3.60 per cent in the year 2008-09. The state of Goa also not being an exception to the national agriculture distress the continuation of this sector further pushed down to 3.30 per cent in the year 2009-10. Agricultural sector continued to contribute further less with 2.68 per cent in 2010-11. Again a decline occurred in its contribution by 2.19 per cent in 2012-13 and further a slight fall took place with contribution of 2.13 per cent in the year 2013-14.

Goa is a coastal state where fishing is predominantly a big economy of the state therefore fishing as a sub-sector under agriculture is the next highest contributor to the NSDP that initiated the contribution of 2.05 per cent in 2004-05 which slowly increased to 2.32 per cent in 2005-06. The contribution of fishing declined to 1.99 per cent in 2006-07 while the same further fell to 1.7 per cent in 2007-08. The year 2008-09 witnessed a fall in contribution of fishing below 2 per cent (reaching 1.55 per cent) and 2009-10 saw more fall in the contribution of fishing to 1.35 per cent. Significant fall in the fishing contribution occurred in the year 2010-11 when it contributed 1.15 per cent, the lowest contribution to the state economy and in the following year of 2011-12 its contribution fell to 0.97 per cent. Followed by worst contribution of 0.87 per cent in 2012-13 and minor rise in its contribution was witnessed in the year 2013-14 to 1.12 per cent. Another sub-sector of the state economy of Goa is Forestry and Logging which comes under agriculture is the lowest contributing sector to the state economy with less than 1 per cent for the entire time period. Its initial contribution started with 0.69 per cent in the year 2004-05, maintaining the same level in the year 2005-06 with 0.65 per cent. In the next year however it contributed slightly more that was 0.59 per cent in 2006-07. But again the fall in its contribution continued with 0.58 per cent in 2007-08 and 0.59 per cent in the next year of 2008-09. The contribution of the sector again increased marginally to 0.52 per cent in 2009-10. Surprisingly, in 2010-11 it contributed 0.46 per cent and again showed the same fall in its contribution to 0.42 per cent in 2011-12. With 0.37 per cent contribution in 2012-13 the Forestry and Logging showed a decline and it again increased to 0.38 per cent in terms of its contribution to the NSDP of Goa in 2013-14. The second sub-sector of the economy is mining and Quarrying contributed 4.26 per cent to the Net State Domestic Product during the year 2004-05. Here too as noticed earlier slight rise took place and it contributed 4.04 per cent in the year 2005-06. Major mining activity of the state led to an increased revenue to mining companies and subsequent increase in contribution to state of 5.18 per cent in the year 2006-07. This increased contribution further increased to 3.97 per cent in the year 2007-08. Thus in the subsequent years increase in contribution took place with 2.68 per cent in the year 2008-09, 2.93 per cent in 2009-10, 4.39 per cent in 2010-11 and a slight decrease with contribution as opposed to earlier of 3.97 per cent to the state NDP in the year 2011-12. A sharp reduction in its contribution was witnessed following the mining ban in the state bringing down its contribution to 1.4 per cent in 2012-13 and to 1.3 per cent in 2013-14.

Primary sector as major crucial component of the economy of the state of Goa at all levels contributed 11.96 per cent during the year 2004-05. In 2005-06 it began increasing its contribution steadily but slowly which reached to 12.89 per cent in 2005-06. Declined its contribution little bit to 11.72 per cent in the year 2006-07. In 2007-08 the contribution of the primary sector again fell to 10.04 per cent. Sector further suffered losses and hence contributed 8.37 per cent in 2008-09. A slight rise to 8.68 per cent was witnessed in the year 2010-11 and again a small decline took place in the year 2011-12 by contributing 8.62 per cent. More than half of the decrease was witnessed in the year 2012-13 to 4.83 per cent and a slight rise took place in the year 2013-14 to 4.93 per cent. Industrialization propelled the secondary sector with manufacturing rising to be the dominant and major dependent sector for growth in the industrial arena to progress heavily. Manufacturing contributed 28.28 per cent in the year 2004-05. But the growth slowed down and so the contribution remained at 28.38 per cent in the year 2005-06. Decline in growth continued the contribution of 28.95 per cent in the year 2006-07. It is interesting to note that the stagnancy in growth took place for the succeeding years of 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12. During this we see that the manufacturing sector contributed 28.68 per cent, 27.78 per cent, 27.35 per cent, 25.61 per cent and 23.53 per cent respectively. Major fall to 21.11 per cent in 2012-13 and further to 20.28 per cent was seen in the year 2013-14. Registered Manufacturing within the scope of manufacturing turned out to be the dominant sub-sector of the economy by contributing 24.29 per cent to the state in the year 2004-05, following the slowdown in the manufacturing sector also witnessed a stagnant contribution of 24.41 per cent in 2005-06. Considering the stagnancy decrease in contribution continued with 24.79 per cent in the year 2006-07. Depression in manufacturing continued with 22.07 per cent contribution in the year 2010-11 and subsequently 20.78 per cent in the year 2011-12. In 2012-13 contribution of this sector decreased to 18.2 per cent and again to 17.32 per cent in 2013-14. Unregistered Manufacturing sector of the state has contributed much less than the registered manufacturing with 3.99 per cent as the opening contribution during the year 2004-05. It remained at 3.97 per cent in the year 2005-06. Such signs of improved contribution also continued with contribution of 4.17 per cent in 2006-07. Almost the same amount of contribution continued with 4.57 per cent in during the year 2007-08. Downfall started with contribution of 4.24 per cent in 2008-09. No improvement took place in the year 2009-10 is depicted through the contribution of 4.01 per cent to the state, 3.54 per cent contribution in 2010-11 and 2.76 per cent contribution in 2011-12 brings out the fall. In 2012-13 contribution increased to 2.91 per cent and was 2.96 per cent in the year 2013-14. Construction is another sub-sector which contributed 11.47 per cent to start with in the year 2004-05 showing fluctuating contributions within the range of 9 to 6 per cent spread over these years up to 2011-12, and lowest contribution of 1.62 per cent in 2013-14. Electricity, Gas and Water Supply yet another group of sub-sector contributed ranging from 1.22 per cent to per cent in 2004-05 to 9.96 per cent in 2013-14 showing a rise in contribution.

Tertiary sector consists of different types of activities such as the Trade, Hotels and Restaurant that contributed 13.63 per cent in the year 2004-05 and ended up to 8.9 per cent in 2013-14 with volatile fluctuations in between these 10 years when the

contribution boosted and brought down at the same time. Transport, Storage and Communication went ahead marginally contributing 13.83 per cent in the year 2004-05 to 31.49 per cent to the Net State Domestic Product during the year 2013-14. This however is interesting because it's fall in contribution continued for initial phase of 4 years from 2005-06 to 2008-09, but again rose to 13 per cent in 2009-10.



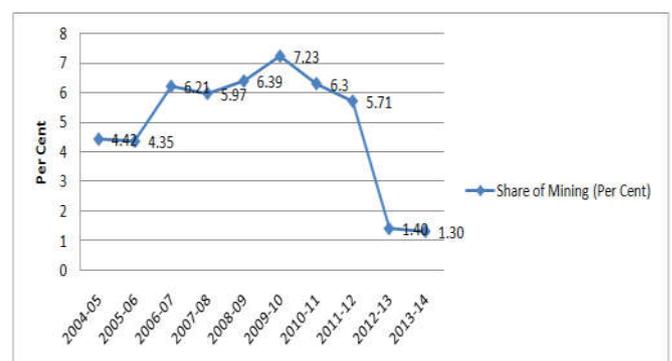
Source: Economic Survey of Goa, Various Issues

**Figure 10. The Contribution of Mining to the Gross State Domestic Product at Factor Cost of Goa from the Period 2004-05 to 2013-14 at Current Prices (Rs in Lakh) Base Year 2004-05**

Very much synonymous to the foregoing the railways portrays the insignificant contributing sector with less than 1 per cent starting from 0.32 per cent in the year 2004-05 to 0.31 per cent in the year 2013-14. The sector does not bring startling fluctuations but just a small rise and fall have occurred. Surface Transport by other means however looked promising in terms of its contribution from 12.18 per cent in 2004-05 to 29.25 per cent in the year 2013-14. Communication contributed 1.33 per cent in 2004-05 and 1.91 per cent in the year 2013-14. Financing, Insurance, Real Estate and Business Services proved to be the major contributors with 12.14 per cent in the year 2004-05 that over 8 years' time period it came down to 13.19 per cent in the year 2013-14. Fluctuations came in the range of 10 to 9 per cent in average contribution of this sector. With contributions from Banking and Insurance 6.09 per cent on average in 2004-05 to 6.91 per cent in 2013-14. Real Estate, Ownership of Dwellings and Business Services contributed 6.05 per cent in the year 2004-05 to 6.29 per cent in 2013-14 to the Net State Domestic Product of Goa. Community, Social and Personal Services yet another sub-sector contributed 7.46 per cent in the year 2004-05 and 9.63 per cent in the year 2013-14. Range of 8 per cent average fluctuation was witnessed over the time period. Public Administration and Other services contributed about 3 per cent and 4 to 5 per cent respectively with a small but important contribution to the tertiary sector. Considering the role of all 3 sectors the tertiary sector contributed the most to the state economy of Goa with contributions ranging from 47.06 per cent in 2004-05, 46.49 per cent in 2005-06, 46.96 per cent in 2006-07 and 48.54 per cent in 2007-08. In 2008-09 its contribution increased slightly to 51.66 per cent. Slight increase again occurred in the year 2009-10 with its contribution of 52.39 per cent. Thus in 2010-11 and 2011-12 contributions of 52.66 per cent and 55.16 per cent were witnessed showing a rise by almost 1 per cent each year. In 2013-14 contribution of tertiary sector to the NSDP of Goa was 63.21 per cent showed again slight boost in its contribution. Contribution of Mining as one of the vital sub-sectors to the Gross State Domestic Product at current price, as well as the contribution of mining as percentage of the GSDP can be seen clearly. The above data show the contribution of

mining over time period of 8 years. In the beginning of 2004-05 the mining is valued at rupees 56198 lakhs, and the total value of GSDP was 1271331 lakh rupees in the same year thus the share of mining in the GSDP of the state of Goa was 4.42 per cent in 2004-05. In 2005-06 the value of the mining was rupees 66973 lakhs, and the total value of GSDP was 1432659 lakh rupees in the same year thus the share of mining in the GSDP stands at 4.67 per cent in 2005-06 as opposed to its share in the earlier year showing a marginal increase in its share to the GSDP of the state of Goa.

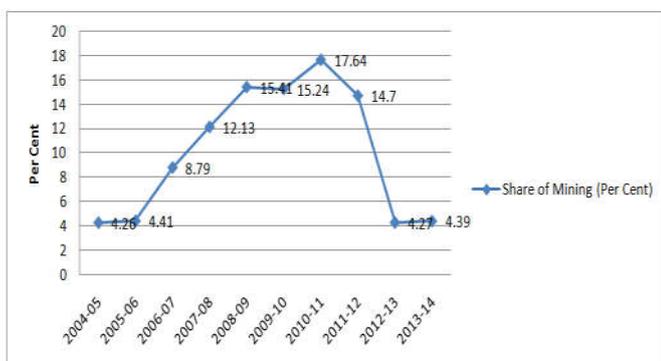
In 2006-07 the value of mining was rupees 154662 lakhs, and the total value of the GSDP stood at 1652283 lakh rupees. In the same year the share of mining in the GSDP was 9.36 per cent as opposed to its share in the earlier year showing more than double increase in its share to the GSDP of the state of Goa. In 2007-08 the value of mining was 253255 lakhs, and the total value of GSDP was 1956496 lakh rupees. Thus the share of mining in the GSDP was 12.94 per cent in 2007-08 as opposed to its share in the earlier year showing 3 times increase in its share to the GSDP of Goa. The value of mining in the year 2008-09 was 427857 lakhs, and the total value of the GSDP was 2541383 lakh rupees. The share of mining in the GSDP becomes 16.84 per cent while taking into account the share of mining in 2004-05 the share in 2008-09 is quadrupled. In 2009-10 the value of mining was 500345 lakhs, and the total value of GSDP was 2912554 lakh rupees. Thus the share of mining in the GSDP stood at 17.18 per cent in 2009-10. As opposed to its share in the earlier year shows a marginal increase in its share in the GSDP from 2008-09. In the next year of 2010-11 the value of mining was 663199 lakhs while the total value of the GSDP was 3350011 lakh rupees. In the same year thus the share of mining in the GSDP was 19.80 per cent. As opposed to its share in 2004-05 showing 5 times increase in its share to the GSDP than its initial contribution in 2004-05. In the year 2011-12 the value of mining stood at 664223 lakhs whereas the total value of GSDP was 3677503 lakh rupees. Thus the share of mining in the GSDP was 18.06 per cent. It is evident from the comparative observation of the data given in the above table that the contribution of mining has come down drastically from 18.06 per cent in 2011-12 to 4.80 per cent in the year 2012-13 and further down to 4.16 per cent in 2013-14. Thus, the overall share of Mining sector in the GSDP of the state of Goa on an average stood at 11.22 for the time period under consideration however; its share was around 5 per cent in the initial year of 2004-05 and finally the same reached at 4.16 per cent in the year 2013-14.



Source: Economic Survey of Goa, Various Issues

**Figure 11. The Contribution of Mining to the Gross State Domestic Product at Factor Cost of Goa From the Period 2004-05 to 2013-14 at Constant Prices (Rs In Lakh) Base Year 2004-05**

Perusal of the data in the above figure displays share of mining in the Gross State Domestic Product at factor cost at constant prices from the time period from 2004-05 to 2011-12 at Constant Prices in lakh rupees computed by taking 2004-05 as the base year. The contribution of Mining as one of the predominant sub-sector to the total Gross State Domestic Product, as well as the contribution of mining as percentage of the GSDP can be seen clearly. The above data show the contribution of mining over time period of 8 years. In the beginning of 2004-05 the mining valued at rupees 56198 lakhs, and the total value of the GSDP was 1271331 lakh rupees. In the year thus the share of mining in the GSDP stood at 4.42 per cent in 2004-05. In subsequent year of 2005-06 the value of mining was 59502 lakhs, and the total value of GSDP was 1367162 lakh rupees. Thus the share of mining in the GSDP was 4.35 per cent as opposed to its share in the earlier year the contribution of mining has remained almost stagnant. Looking at the contribution and the value of mining in because of which was rupees 93351 lakhs, and the total value of GSDP was 1504172 lakh rupees. The share of mining in the GSDP was 6.21 per cent in 2006-07. In 2007-08 through mining the state could ear rupees 94752 lakhs while the total value of GSDP was 1587538 lakh rupees. Hence the share of mining in the GSDP was 5.97 per cent in 2007-08 as opposed to its share in the earlier year it shows an increase by one and a half times. In 2008-09 the value of mining was rupees 111587 lakhs, and the total value of GSDP was 1746618 lakh rupees. In the same year thus the share of mining in the GSDP was 6.39 per cent in 2008-09. As compared to its share in the earlier year it shows a rapid increase in its share to the GSDP. In 2009-10 the value of mining stood at 139093 lakhs, and the total value of the GSDP was 1924828 lakh rupees. The share of mining in the GSDP was 7.23 per cent. The value of mining was rupees 133895 lakhs in 2010-11 and the total value of GSDP remains at 2125895 lakh rupees in the same year. Thus the share of mining in the GSDP contributed for the year was 6.30 per cent. As opposed to its share in the earlier year of 2009-10 it shows an increase in its share to the GSDP. In 2011-12 the value of mining was rupees 137401 lakhs while the total value of GSDP stood at 2406670 lakh rupees in the same year thus the share of mining in the GSDP of Goa was 5.71 per cent in 2011-12.



Source: Economic Survey of Goa, Various Issues

**Figure 12. The Contribution of Mining to the Net State Domestic Product at Factor Cost of Goa From the Period 2004-05 to 2013-14 at Current Prices (Rs In Lakh) Base Year 2004-05**

As opposed to its share in the earlier year it shows a marginal fall in its contribution to the GSDP. It is clear by looking at the data given in the above table that the contribution of mining

has come down drastically from 5.71 per cent in 2011-12 to 1.40 per cent in the year 2012-13 and further down to 1.30 per cent in 2013-14. Thus, the overall share of Mining sector to the GSDP of the state of Goa on an average stood at 4.92 per cent for the time period under consideration however; its share was around 4.42 per cent in the initial year of 2004-05 and finally its share reached at 1.30 per cent in the year 2013-14. It can be seen from the perusal of the data in the above table that the share of mining in the GSDP of Goa was almost stagnant for the period of 2004-05 and 2005-06. Suddenly in the year 2006-07 the contribution of mining to GSDP doubled and became 8.79 per cent afterwards the share stayed at double digits. The above table displays the Net State Domestic Product at factor cost from the time period between 2004-05 and 2011-12 at Current Prices in lakh rupees computed by taking into account 2004-05 as the base year. The perusal of the data in the above table brings out the contribution of Mining as a sub-sector individually in lakh rupees, the total Gross State Domestic Product, as well as the contribution of mining as percentage of the GSDP of Goa. The above data show the contribution of mining over a time period of 8 years. In the beginning of 2004-05 the mining valued worth rupees 46874 lakhs, and the total value of the GSDP of Goa was 1099869 lakh rupees. The share of mining in the GSDP was 4.26 per cent in 2004-05. In the year 2005-06 the value of mining stood at rupees 55021 lakhs whereas the total value of the GSDP of Goa was 1248779 lakh rupees. In the same year thus the share of mining in the GSDP was 4.41 per cent. As opposed to the share of mining in the GSDP in the earlier year it shows a marginal increase. In the immediate subsequent year of 2006-07 the value of mining was rupees 126501 lakhs, and the total value of the GSDP was 1439354 lakh rupees. The share of mining in the GSDP was 8.79 per cent while opposed to its share in the earlier year it brings out a double increase in its share to the GSDP.

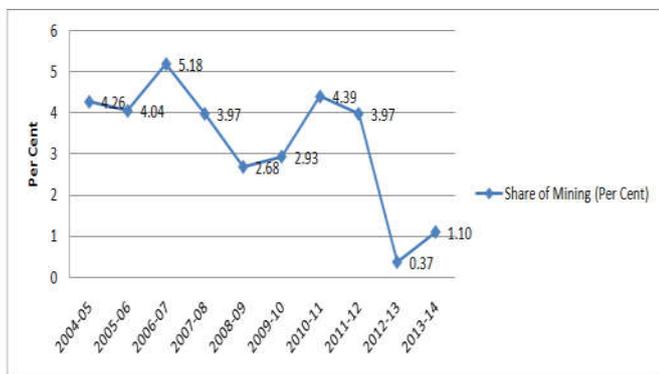
The value of mining in 2007-08 was 206712 lakhs, and the total value of the GSDP was 1704548 lakh rupees while the share of mining in the GSDP stood at 12.13 per cent looking into its share in the year 2004-05 it shows a triple increase in its share in the GSDP. In 2008-09 the value of mining was 341352 lakhs, and the total value of GSDP was 2214880 lakh rupees. In the same year thus the share of mining in the GSDP was 15.41 per cent. As opposed to its share in the beginning it shows almost 4 times increase in its share to the GSDP. In the value of mining in 2009-10 reached at rupees 384447 lakhs and the total value of GSDP at 2522363 lakh rupees. Thus the share of mining in the GSDP became 15.24 per cent. In the year 2010-11 mining fetched value of rupees 507921 lakhs and the GSDP was 2878910 lakh rupees. Hence the share of mining in the GSDP stood at 17.64 per cent. While the value of mining in the year 2011-12 was rupees 456193 lakhs the total value of the GSDP was 3103322 lakh rupees. Thus the share of mining in the GSDP stood at 14.70 per cent. As opposed to its share in the earlier year it shows a marginal fall in its share to the GSDP. It is understood by having a glance at data given in the above table that the contribution of mining has come down drastically from 14.70 per cent in 2011-12 to 4.27 per cent in the year 2012-13 and slightly increased to 4.39 per cent in 2013-14. Thus, the overall share of Mining sector to the GSDP of the state of Goa on an average has remained at 10.12 per cent for the time period under our consideration however; its share was around 4.26 per cent in the initial year

of 2004-05 and finally the same reached at 4.39 per cent in the year 2013-14.

**Table 4. The Contribution of Mining to the Net State Domestic Product at Factor Cost of Goa From the Period 2004-05 to 2013-14 at Constant Prices (Rs in Lakh) Base Year 2004-05**

Year	Mining (Rs. Lakh)	GSDP (Rs. Lakh)	Share of Mining (Per Cent)
2004-05	46874	1099869	4.26
2005-06	48185	1191644	4.04
2006-07	67828	1308515	5.18
2007-08	54278	1365494	3.97
2008-09	39504	1472765	2.68
2009-10	47173	1611867	2.93
2010-11	80378	1832409	4.39
2011-12	83884	2113184	3.97
2012-13	8943	2442104	0.37
2013-14	28812	2609241	1.10

Source: Economic Survey of Goa, Various Issues

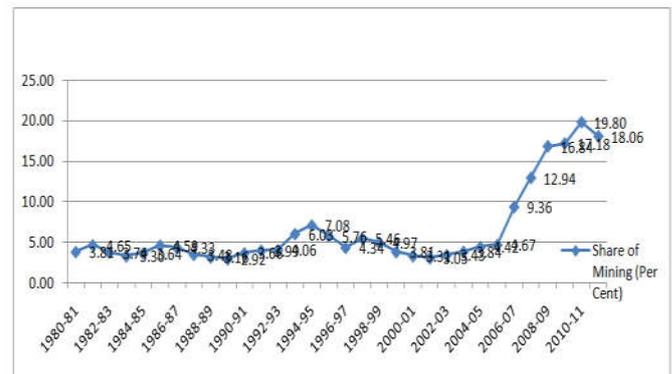


Source: Economic Survey of Goa, Various Issues

**Figure 13. The Contribution of Mining to the Net State Domestic Product at Factor Cost of Goa From the Period 2004-05 to 2013-14 at Constant Prices (Rs In Lakh) Base Year 2004-05**

The share of mining in the NSDP of Goa at constant prices for over a period of eight years is depicted in the above table. The perusal of the data shows that the share of mining for the period under review remained fluctuating. The data in the above table displays the Net State Domestic Product at factor cost and the contribution to it by the mining from the time period 2004-05 to 2011-12. The NSDP is at Constant Prices in lakh rupees computed by taking 2004-05 as the base year. The contribution of Mining as sub-sector is given in lakh rupees. The total Net State Domestic Product, as well as the contribution of mining as percentage of it can be seen clearly. The above data shows the contribution of mining over time period of 8 years. In the beginning of 2004-05 the mining valued worth rupees 46874 lakhs, and the total value of NSDP was 1099869 lakh rupees. In the same year thus the share of mining in the NSDP was 4.26 per cent in 2004-05. The value of mining in 2005-06 was rupees 48185 lakhs, and the total value of GSDP was 1191644 lakh rupees. Thus the share of mining in the GSDP stood at 4.04 per cent. As opposed to its share in the earlier year the share of mining in 2005-06 has shown a marginal decrease in its share to the NSDP of the state of Goa. In 2006-07 the value of mining stood at rupees 67828 lakhs, and the total value of the NSDP was 1308515 lakh rupees. The share of mining in the NSDP was 5.18 per cent. As compared to its share in the earlier year it has increased its share to the NSDP. The value of mining in 2007-08 was rupees 54278 lakhs, and the total value of NSDP was 1365494 lakh rupees. In the same year thus the share of

mining in the NSDP was 3.97 per cent. The contribution of mining in 2008-09 was rupees 39504 lakhs, and the total value of GSDP was 1472765 lakh rupees. Thus the share of mining in the GSDP was 2.68 per cent. As opposed to its share in the earlier year (2007-08) it has shown a rapid decrease in its share to the NSDP. For 2009-10 the value of mining stood at rupees 47173 lakhs, and the total value of NSDP was 1611867 lakh rupees. Thus the share of mining in the NSDP was 2.93 per cent in 2009-10 as opposed to its share in the earlier year it has registered a slight increase in its share to the NSDP. In the subsequent year of 2010-11 the value of mining was 80378 lakhs, and the NSDP stood at 1832409 lakh rupees while the share of mining in the NSDP was 4.39 per cent. As opposed to its share in the earlier year the share of mining in the NSDP has increased. During the year 2011-12 the value of mining was rupees 83884 lakhs, and the total value of NSDP was 2113184 lakh rupees. In the same year thus the share of mining in the NSDP was 3.97 per cent in. It can be pointed out by looking at the data given in the above table that the contribution of mining has come down drastically from 3.97 per cent in 2011-12 to 0.37 per cent in the year 2012-13 and further down to 1.10 per cent in 2013-14. The overall share of Mining sector in the NSDP of the state of Goa on an average has remained at 3.28 per cent for the time period under consideration. However; its share was around 4.26 per cent in the initial year of 2004-05 and finally it reached at 1.10 per cent in the year 2013-14.



Source: Economic Survey of Goa, Various Issues.

**Figure 14. Annual Share of Mining in the GSDP of Goa (Per Cent)**

The data display the Gross State Domestic Product at factor cost from the time period 1980-81 to 2011-12 at Constant Prices in lakh rupees computed by taking 2004-05 as the base year. The table also provides the information on the annual contribution of mining to the state GSDP. The contribution of Mining sub-sector is given in lakh rupees. The total Gross State Domestic Product, as well as the contribution of mining as percentage of the GSDP can be seen clearly. The above data show the contribution of mining over a time period of eight years. In the beginning of 1980-81 the mining valued worth rupees 1801 lakhs, and the total value of the GSDP was 47216 lakh rupees. In the same year thus the share of mining in the GSDP stood at 3.81 per cent in 2004-05. The mining was valued worth rupees 2409 lakhs, and value of GSDP was 51787 lakh rupees in the same year thus the share of mining in the GSDP was 4.65 per cent in 2004-05. In the year 1982-83 the mining is valued at rupees 2302 lakhs, and the total value of the GSDP was 61625 lakh rupees. Thus the share of mining in the GSDP stood at 3.74 per cent. In the subsequent year of

1983-84 the value of mining was rupees 2149 lakhs, and the total value of GSDP of Goa was 65151 lakh rupees therefore the share of mining in the GSDP was 3.30 per cent. In 1984-85 the contribution of mining is valued at rupees 2880 lakhs, and the total value of GSDP was 79116 lakh rupees. The share of mining in the GSDP for the year stood at 3.64 per cent. While the value of mining was rupees 3574 lakhs the total value of the GSDP stood at 77792 lakh rupees and the share of mining in the GSDP was 4.59 per cent. Revenue from mining in 1986-87 stood at rupees 3967 lakhs, and the total value of GSDP was 91625 lakh rupees. In the same year thus the share of mining in the GSDP was 4.33 per cent. In the year 1987-88 the mining is valued worth rupees 3539 lakhs, and the total value of GSDP of 101693 lakh rupees whereas the share of mining in the GSDP was 4.26 per cent. For the year 1988-89 the mining was valued at rupees 3671 lakhs, and the total value of GSDP of the state of Goa was 116155 lakh rupees and therefore the share of mining in the GSDP was 3.16 per cent. In the year 1989-90 the mining was valued at rupees 3911 lakhs while the total value of GSDP was 133958 lakh rupees whereas the share of mining in the GSDP was 2.92 per cent. For the year 1990-91 the mining is valued at rupees 5460 lakhs whereas the total value of GSDP of Goa was 149349 lakh rupees hence the share of mining in the GSDP stood at 3.66 per cent. In 1991-92 the revenue from mining was rupees 7349 lakhs, and the GSDP was 184260 lakh rupees hence the share of mining in the GSDP was 3.99 per cent.

In the beginning of the economic liberalization the mining was rupees 9021 lakhs, and the total value of GSDP was 222410 lakh rupees which bring out the share of mining in the GSDP at 4.06 per cent in 1992-93. In 1993-94 the total value of mining was rupees 15726 lakhs while the GSDP was 260937 lakh rupees and the share of mining in the GSDP was 6.03 per cent. While in 1994-95 the mining was valued at rupees 21862 lakhs the GSDP of the state of Goa was 308978 lakh rupees and the contribution of mining in the GSDP was 7.08 per cent. In 1995-96 the income received from mining was rupees 20824 lakhs while the GSDP was 361375 lakh rupees whereas in the same year thus the contribution of mining in the GSDP was 5.76 per cent. Mining had fetched the receipts for rupees 18736 lakhs and the GSDP was 431679 lakh rupees whereas the share of mining in the GSDP was 4.34 per cent in 1996-97. Looking at 1997-98 the mining was valued worth rupees 29282 lakhs, and the total value of the GSDP was 535826 lakh rupees. In the same year thus the share of mining in the GSDP was 5.46 per cent. In 1998-99 the total value of mining was rupees 32850 lakhs and the GSDP was 661419 lakh rupees. In the same year thus the share of mining in the GSDP was 4.97 per cent. The state mining sector received the income of rupees 27281 lakhs and the total value of the GSDP was 716355 lakh rupees while the share of mining in the GSDP was 3.81 per cent. In 2000-01 the mining fetched rupees 25179 lakhs while the GSDP stood at 760645 lakh rupees and the share of mining in the GSDP remained at 3.31 per cent. For 2001-02 the mining is valued at rupees 24484 lakhs and the GSDP was 801639 lakh rupees therefore the share of mining in the GSDP was 3.05 per cent. In 2002-03 the total value of was rupees 34224 lakhs and the value of GSDP 997670 lakh rupees hence the share of mining in the GSDP was 3.43 per cent. In 2003-04 the mining being at the peak of it had fetched rupees 45666 lakhs when the GSDP was 1188798 lakh rupees whereas the share of mining in the GSDP was 3.84 per cent. The income from mining increased to rupees 56198 lakhs and the total

value of GSDP was 1271331 lakh rupees which pushed the share of mining in the GSDP to 4.42 per cent in 2004-05. In 2005-06 the value of mining declined to rupees 1801 lakhs and the total value of the GSDP stood at 47216 lakh rupees. In the same year thus the share of mining in the GSDP was 4.67 per cent. In 2006-07 the value of mining was 2409 lakhs and the GSDP was 51787 lakh rupees. In the same year thus the share of mining in the GSDP stood at 9.36 per cent. As opposed to its share in the earlier year we find that the same has increased. For 2007-08 the value of mining was 2302 lakhs and the total value of GSDP was 61625 lakh rupees whereas the share of mining in the GSDP stood at 12.94 per cent while opposed to its share in the earlier year it had shown an increase of 3.58 per cent. In 2008-09 the value of mining was 2149 lakhs and the total value of GSDP was 65151 lakh rupees. In the same year thus the share of mining in the GSDP was 16.84 per cent. For the year 2009-10 the value of mining was 2880 lakhs and the GSDP was 79116 lakh rupees whereas the share of mining in the GSDP was 17.18 per cent. While in 2010-11 the value of mining was 3574 lakhs, and the total value of GSDP was 77792 lakh rupees the share of mining in the GSDP was 19.80 per cent. In the year 2011-12 the value of mining stood at 3967 lakhs, and the total value of the GSDP was 91625 lakh rupees whereas the share of mining in the GSDP was 18.06 per cent. The overall share of Mining sector to the GSDP of the state of Goa on an average has been 6.36 per cent for the time period under consideration however; its share was around 4 per cent (3.81 per cent) in the initial year of 2004-05 and finally it reached at 18.06 per cent in the year 2011-12.

### Concluding Remarks

Mining has contributed significantly within the primary sector to the state economy and has led to its growth and development. However its contribution has seen upward rising trend from 5 per cent share in the beginning and later on increasing gradually its share in the total GSDP of the state economy from 2004-05 to 2011-12. This has been going on because of the huge demand created for iron both within the domestic steel industry as well as by foreign countries such as the China. Therefore, due to this increasing demand more minerals were mined and hence the share of mining in the GSDP of Goa had increased tremendously in the recent years almost more than quadrupling.

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