CHAPTER – V

INFRASTRUCTURE AND TOURISM RESOURCES IN GOA

Introduction

Infrastructure is a basic prerequisite for economic development. An economy may have enormous resources, natural, man-made and physical; yet, the economy may remain backward due to absence of proper infrastructure so that resources may be utilized optimally to suit its needs. While exploiting the resources, it is necessary to ensure restraints, which otherwise, may result in over exploitation and may pose danger for the economy. As tourism is of great importance in Goa, the present chapter discusses what may be termed as tourism resources or tourism products that exist in Goa and the available infrastructure for further development and its impact mainly on agriculture, industry and mining. It assesses, if the existing infrastructure is enough to promote further growth of tourism in Goa. It is envisaged in the Tenth Plan (2002-07) that the States are to provide supportive infrastructure development strategy and provision of fiscal and monetary incentives to catalyze private sector investment in order to protect the industry and the consumers.¹ In view of this motivation, that the chapter highlights some of the tourist products that the State of Goa preserves, some of which are natural and some are man-made and the infrastructure scenario.²

Mother nature has been extremely bountiful and generous to Goa. She has endowed Goa with some of her most beautiful creations, such as the landscape, lush-green rain forest along the Western ghats, the sandy beaches, the mighty sea, natural harbour, mountains and hillock stretching right across and merging at the sea, rich cultural heritage and by
and large, hospitable people. These products are the treasures that need to be protected and conserved. The zeal of promoting tourism in the State should be carefully developed and managed by one and all so that these treasures are conserved on sustainable basis.  

With the growing importance of tourism in the State and its far-reaching consequences, both positive and negative, what is critical is to create and manage suitable infrastructure as efficiently as possible so that the twin purposes of conservation and management may be served meaningfully. Destinations that fail to maintain the necessary infrastructure, in terms of tourism resources or build inappropriate infrastructure run significant risks. For example, Italy’s Adriatic sea coast has been devastated by the adverse publicity associated with the growth of brown algae that made bathing nearly impossible. Growing pollution levels at the Grand Canyon and overcrowding significantly diminished the attractiveness of great national parks. Tourists ferried around in four-wheel-drive vehicles are turning some of East Africa’s renowned game parks into dust bowls. Global economic policies on tourism of a country rely on many resources that are grouped into three categories: financial and fiscal resources, economic resources and social resources.  

Financial and fiscal resources involve credit, interest rates, and taxation policies, with the objective to create a favourable environment for savings, investments and creation of new tourism activities that will benefit the entire economy. A lowering of taxation, combined with a drop in interest rates encourages tourism, as this stimulates a growth in tourism investment, thus creating a competitive supply, which ultimately results in growth in demand.  

Economic resources concern a budgetary and monetary policy that has significant effect on domestic prices and on exchange rates. A too rapid expansion of the budget and of
money supply will have negative effects on the national economy and will increase inflation and foreign trade deficit. Hence, monetary and budgetary macroeconomic policies are not enough to encourage tourism demand. However, a lowering of the exchange rate as a result of devaluation can have stimulating effect on tourism demand. The Government of Goa has recently increased the annual budget outlay on tourism. Until 1998-99, the annual budget outlay was hardly Rs.3 crores, which has now increased to Rs.20 crores (2005-06). Moreover, out of this outlay, nearly 50 per cent of this goes to promotional and marketing campaigns alone. Question may arise whether Goa still needs to be projected as a tourist destination, nationally and globally and is definitely a matter of considerable debate. However, it is quite certain by now that Goa is well known as the foremost tourist destination in the country and perhaps, it would be wise to concentrate on strengthening the existing infrastructure at the tourist sites including approaches, maintenance or provide the ones wherever is lacking. Besides, regular and timely disposal of garbage waste generated by shacks and others and proper illumination of the beaches and its surroundings at least from the point of view of safety of the tourists would be appreciative. In the same manner, resources associated with social policies influence tourism development and relate to regulation concerning the length of the working day, holidays and professional training.

Tourism is the most important component of Goa’s economy. By fitting a quadratic trend for the tourist income, it can be predicted that the income from tourism under feasible condition for the year 2010 will be Rs.8432.32 lakhs. As a large number of people in Goa depend on tourism and related activities, it always draws the attention of the authorities so that an appropriate tourism policy may be formulated in respect of tourism resources,
infrastructure, and promotion of tourism on an aggressive scale, marketing strategies and so on. The Government framed a Tourism Policy which acknowledges the leading role of the private sector in tourism development with thrust on diversification and value addition of tourism product, while at the same time emphasizing the basic role of the Government as a prime facilitator, encouragement to private tourism initiatives through appropriate package of fiscal and taxation measures and generation of investor friendly environment. The Tourism Policy aims at balanced sustainable development of tourism while at the same time ensuring that Goa's fragile ecology and environment is maintained. However, the ground realities are different.

It is essential for Goa to develop adequate and necessary tourism infrastructure exclusively to cater to tourist requirements in order to become a niche market. It is quite likely that otherwise tourists may go elsewhere. The present infrastructure facilities cater to both tourists and the local population alike. The Government of Goa has given paramount importance on physical infrastructure development and implementation through State Infrastructure Development Corporation (SIDC) of various projects. Some of these in the light of promotion of tourism in Goa are analyzed below.

**Infrastructure**

**a. Power Sector**

Power or electricity is the lifeline in modern times and important for economic development. Goa purchases power mostly from Maharashtra and Karnataka and receives its share from the Power Grid Corporation. In essence, it has helped tourism to grow in all the coastal villages, which are the main hubs of tourist related activities, and major cities. The entire tourist belt of North and South Goa is by and large illuminated during
nighttime; streetlights along the adjoining roads leading to beaches, lanes and bylanes and Main Roads, are therefore safe for the tourists to move even during the nighttime, however, lots more need to be done to make the beaches safe.10

b. Road Transport

The State of Goa has a good inter and intra surface road linkage as is evident (Statistical Yearbook, 2001) that total road (in kilometer) which was 6489.13 in 1986-87 increased to 9276 in 1997-98. This includes roads under Municipality, Panchayat, and Forest. The National Highways (N.H.) No. 17 connects Mumbai (Maharashtra) and Cochin (Kerala) through Goa and N.H. 4B, connects Goa with Belgaum (Karnataka). Tourists can come directly to Goa by these two Highways. At the same time N.H. 17 is the lifeline connecting North and South Goa.

The public transport system is unable to cater to the ever-increasing flow of tourists. However the State-run Kadamba Transport Corporation along with private operators makes efforts to meet the growing demand. The inter-state bus services of KTC, MSTRC and KSRTC to Karnataka and Maharashtra are available to tourists and public in general. The Yellow/Black Motor cycles, auto rickshaws and taxis provide service to the tourists and the locals. Rent-a-car facilities are also available.

While conducting survey it was observed that the taxi operators were discontent with their business due to the seasonal nature of tourism. There are large number of private tour operators and GTDC conducting sightseeing and also some package tours. They usually cater to the domestic tourists while foreign tourists prefer taxis or sight seeing
tours conducted by star hotels. The State of Goa should upgrade and modernize the existing transportation system to make it more tourists friendly.  

**c. Airport**

There is only one airport at Dabolim, near Vasco-da-Gama. Basically it is meant for the Indian Navy as Goa is one of the Naval bases in the country. The AAI (Airport Authority of India) hires this airport for civilian transportation during the daytime only. Hangers are rented out to Chartered flight operators who bring tourists from abroad, by the Indian Navy. The table No.5.1 provides sufficient justification for an international airport for Goa to cater to tourists coming from foreign countries.  

By and large, the air connectivity to rest of the country and the world is satisfactory. But the Civil Aviation Department or the AAI cannot undertake modernization of the airport independently as it belongs to Defence forces.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Flights</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985-86</td>
<td>24</td>
<td>3568</td>
</tr>
<tr>
<td>1990-91</td>
<td>41</td>
<td>5815</td>
</tr>
<tr>
<td>1995-96</td>
<td>337</td>
<td>75694</td>
</tr>
<tr>
<td>2000-01</td>
<td>419</td>
<td>116992</td>
</tr>
<tr>
<td>2004-05</td>
<td>690</td>
<td>158993</td>
</tr>
</tbody>
</table>

*Source: Tourist Statistics 2005, Department of Tourism, Govt. of Goa.*
Government of India, Ministry of Civil Aviation has approved a new international airport at Mopa in Pernem taluk, is located about 29 kms away from capital city - Panjim, on the border of Goa adjoining Sawantwadi taluk in Maharashtra to be built on BOOT basis. The Government of Goa may have to spend about Rs.200 crore towards land and other consequential expenses. Moreover, as opined by some, it would cause inconvenience to the tourists and as such, many people connected with tourism have expressed reservation over the proposed site for the airport at Mopa. The issue of this airport has, of late, taken a political turn involving M.Ps and other local M.L.A.s, some of whom are opposing and supporting the Mopa airport. The main apprehension for opposing the international airport at Mopa is primarily due to loss of tourist traffic by Goa to Maharashtra as the place is closer to some of the tourist places that the department of tourism of Government of Maharashtra is vigorously trying to develop. The other obvious reason for the opposition is due to its location from some of the tourist places like Varca, Mobor, Palolem in the southern part of Goa and the main Margao city. It is high time that Goa should have an international airport whether in the North or in the South or else Goa would lose foreign tourists who prefer air travel to other modes of travel.

It is pertinent to note that Sea Bird Project at Karwar (nearly 100 kms. from Panjim) is going to be a new Naval base and so the airport perhaps could be shifted there, of course, without compromising the interest of our national security and thus converting the Dabolim airport into a full-fledged civilian airport. However, that materializes or not is a matter to be sorted out at the Central Government level.
d. Railways

Goa is well connected by railways, particularly with the commissioning of the Konkan Railway project since 1996. Prior to that the meter-gauge line of the South Central Railways and the present South Western Railways provided connectivity for the tourists and general public to destinations across the country via Miraj, Bangalore and Secunderabad. The gauge conversion of the South Central / South Western Railways and the commissioning of Konkan Railway have facilitated the access to tourists to Goa from different parts of the country in lesser time and at a cheaper cost.

Direct train services to Delhi, Mumbai, Chennai, Bangalore, Hyderabad, Pune, Mangalore, Trivandram, Cochin and several other cities in India are available from Goa. Madgaon station of the Konkan Railway is the important ISO-9001 certified and largest station in Goa and Vasco-da-Gama station of the South Western Railways follows. These two stations are also terminating stations of some of the important trains running from Goa to other important destinations. The tourism department of Government of Maharashtra and Konkan Railway introduced a new tourist train with all facilities called “DECCAN ODESSEY” for tourists to undertake tour to some of the unexplored tourist places in South Konkan region of Maharashtra and decided to include Goa, which is specifically meant to cater to foreign tourists to boost tourism in the region. This train is like the “PALACE ON WHEEL” run by tourism department of Government of India in collaboration with Indian Railways.

Goa Government’s proposal to introduce Metro Sky Bus as a pilot project to the Ministry of Urban Development has seen the light of the day with the Konkan Railway having been entrusted the job of providing the necessary infrastructure for the test run of this
new technology. It would be a unique experience to tourists once the Sky Bus Project is operational in Goa. At the moment the project seems to demonstrate the operation of the Sky Bus in order to draw the interest of many big and metropolitan cities to start in a bid to ease traffic problems that they are facing. In addition to that proposed monorail project is in the pipeline

e. Inland Water Transport

The State of Goa has 555 kms of inland waterways. These include certain portion that is used for plying of mechanized vessels in the inland waterways without any navigational hazards. In order to ensure safe navigable waterways hydrographic surveys are conducted from time to time. In fact Goa’s real strength lies in its navigational and maritime heritage. Inland waterways are used for river cruise, especially on the river Mandovi that is a great attraction for both domestic and foreign tourists. The Cumbarjua canal is fully navigable and can be developed as tourist attraction by introducing boat cruise, house-boat for tourists.

This can be a safe and cheap mode of mass transportation system for the tourists and the local population. In addition to that the tour operators can explore the possibility of diverting tourists from concentrating on the beaches to the hinterland by introducing village-tourism, ecotourism, nature-tourism and so on through this mean and thus tourists can enjoy the inner beauty of Goa’s picturesque river valleys. In other words, this would provide an opportunity to tourists to experience something different from the conventional form of tourism with which Goa is known all over the world. Imitation of House-boats of Dal Lake in Srinagar in J&K State can be introduced in Goa. After having
an extensive tour of Goa for the purpose of investigation, convincingly, tourism industry would be able to outsmart competitors if the old glory of inland water transportation is revived.

f. Water Supplies and Sewage

In order to meet the ever-increasing industrial, commercial, touristic and domestic demand for water supply and to provide drinking water on long-term and sustainable basis, the Government of Goa accorded priority for augmentation of regional water supply scheme. It is proposed to have a water grid network for entire State and to have linkages with various regional supply schemes. However, it has been observed that due to number of tappings on main supply system trunk line, the distribution of water is not equitable. In Panjim and adjoining areas there is time-to-time water supply while in cities like Margao, there is non-stop water supply. Goa basically depends on rainfall for water, which are stored in the reservoirs located at several places like Opa, Salaulim, Chandel and so on.

The programme of constructing single-seater pour flush water seal latrines for rural Goa is being implemented since 1985. Sulabh International, a non-Government organization has provided low cost toilets at all tourist places throughout the State. There is a plan to construct sewage treatment plants at various places, providing sewage network in major cities and towns.15

Some of the beaches are often found littered with plastic bottles, bags, leftover eatables, filth and dirt. The hotels and shacks close to the beach flush out the effluents directly into the sea. There are no agency / agencies to clean the beaches, except that occasionally the
college and university students undertake the cleaning of the beach that are located close to the institution. The fisher-folks are often found to dump sea garbage and sea-wastes such as weeds, sea snakes and many other non-edible species of fish along the beach, which cause bad smell and pollute the atmosphere to the detriment of the tourists visiting the beaches.

As the urbanization develops together with increasing inflow of tourists, the problem of garbage disposal and its management becomes a nightmare for the civil administration. Goa has been experiencing the rapid rate of growth of urbanization owing to this there are various health hazards that may affect the flow of tourists.

The unused or exhausted mine crests that are located in far off areas may serve as appropriate dumping ground. Some efforts are being initiated at the Government level to study some of the garbage disposal schemes of some of the developed countries like Japan and emulate or perhaps, extend a contract of constructing garbage disposal plants in Goa, so that the problem could be tackled in the right earnest. Otherwise, very soon one will find the rivers and sea getting fully polluted causing large-scale destruction of marine bio-diversity and health of general public. Such a thing, if, ever happens, it would cost Goa very dearly in terms of loss of tourists and may sound death knell of the tourism industry.

g. Hotels and Other Accommodations

Goa has fairly good number of hotels and other forms accommodations such as lodges, guesthouses, resorts etc. The table No. 5.2 shows total number of hotels including star category hotels/Paying Guest Houses with room/bed capacity:
Table No. 5.2 Total No. of Hotels/Guesthouses with room/bed Capacity

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Hotels</th>
<th>No. of Rooms</th>
<th>No. of Beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>'A'</td>
<td>42</td>
<td>4046</td>
<td>7024</td>
</tr>
<tr>
<td>'B'</td>
<td>126</td>
<td>4433</td>
<td>8968</td>
</tr>
<tr>
<td>'C'</td>
<td>296</td>
<td>4525</td>
<td>8216</td>
</tr>
<tr>
<td>'D'</td>
<td>1692</td>
<td>6308</td>
<td>12410</td>
</tr>
</tbody>
</table>

Source: Tourist Statistics 2005, Department of Tourism, Govt. of Goa.

As the State is divided into two districts, namely North Goa and South Goa, the district-wise North Goa has 1490 hotels with a bed capacity of 21,643 and South Goa has 343 hotels with a bed capacity of 8,974 respectively (Tourist Statistics 2005). One can see the scarcity of accommodation during the December-January peak period when there is a mad rush of the tourists to visit Goa to celebrate the Christmas and New Year. As one can also notice sizeable increase in the number of tourists every year (approximately 5 percent), there is need for more hotel accommodation in some selected tourist places with an emphasis on construction of budget hotels in Goa such as Palolem.

The table No.5.3 shows all the major hotels are located along the beaches spread across North and South Goa. In addition to these there is one Heritage category Hotel at Panjim and a large number of lodges, and Residencies at Panjim, Vasco, Calangute, Margao, Old Goa, Farmagudi, Colva, Miramar, Mapusa, Mayem, Mollem, Tiracol and Britona that are run by Goa Tourism Development Corporation.
Table No. 5.3 Star Category Hotels with Rooms and Beds Capacity

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Hotels</th>
<th>No. of Rooms</th>
<th>No. of Beds</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-Star Deluxe</td>
<td>11</td>
<td>1992</td>
<td>3685</td>
<td>Varca, Miramar, Dona Paula, Majorda, Sinquerim, Cavelossim, Benaulim</td>
</tr>
<tr>
<td>5-Star</td>
<td>3</td>
<td>352</td>
<td>728</td>
<td>Bogmalao, Cavelossim, Varca</td>
</tr>
<tr>
<td>4-Star</td>
<td>2</td>
<td>311</td>
<td>622</td>
<td>Arpora, Cavelossim</td>
</tr>
<tr>
<td>3-Star</td>
<td>19</td>
<td>1167</td>
<td>2341</td>
<td>Calangute, Cansaulim, Vasco, Panjim, Betalbatim, Margao, Colva, Divar Island</td>
</tr>
<tr>
<td>2-Star</td>
<td>24</td>
<td>1271</td>
<td>2551</td>
<td>Cansaulim, Calangute, Baga, Bogmalao, Panjim, Miramar, Dona Paula, Arpora, Caranzalem</td>
</tr>
<tr>
<td>1-Star</td>
<td>19</td>
<td>743</td>
<td>1514</td>
<td>Baga, Benaulim, Sinquerim, Cansaulim, Caranzalem, Calangute, Colva, Margao, Vagator, Anjuna</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>5836</td>
<td>11441</td>
<td></td>
</tr>
<tr>
<td>Heritage</td>
<td>1</td>
<td>13</td>
<td>26</td>
<td>Panjim</td>
</tr>
</tbody>
</table>

Source: Tourist Statistics 2005, Department of Tourism, Govt. of Goa.

h. Telecommunication

The State has an excellent network in respect of telephone, telex, fax, mobile telephone service and telegraph. While landline operation is exclusively managed and run by the State-owned BSNL, mobile services are operated by a large number of private service providers.
providers like Idea, Airtel, Tata, BPL etc., besides BSNL. One can find at least a dozen PCOs along the beaches, street corners, and important roadside junctions providing basic telephone services.

There are 258 post offices across the State comprising 58 urban and 200 rural respectively (Tourist Statistics 2004). In addition to that private courier services such as DTDC, Fast Track, First Flight, etc. are also available, widely competing with the State-owned Department of Post. Tourists and the local population avail the services on equal terms and without any discrimination.

i. Healthcare Services

The Government of Goa has taken utmost care in providing an extensive health system to the people of the State. The Directorate of Health Services has a network of 172 sub-centres, 29 RMDs, 19 PHCs and 5 CHCs, 18 Dental clinics, two Homeopathic dispensaries and three Ayurveda dispensaries. There are 152 hospitals in all both in private and public sectors. Some of the private sector hospitals are Apollo Victor, Apollo Nusi, and Manipal Hospital while Goa Medical College-cum-Hospital is the lone State-run hospital and two District Hospitals Asilo and Hospicio at Mapusa and Margao respectively. The Government has undertaken health programmes from time to time such as Malaria control, SARS, Hepatitis and other vaccinations and most importantly the HIV/ AIDS control programme, which is rising at an alarming rate in Goa. The incidence of HIV / AIDS cases in Goa is partly attributed to growth of tourism in the State. An opportunity for promoting medical tourism exists due to corporatization and standardization of medical profession in the State. Private hospitals provide excellent
medical facilities with state of the art technology and professional doctors. Goa can definitely benefit from this form of tourism.

Thus we find that Goa does not have a specific tourist-centric infrastructure that would exclusively cater to tourist requirements. It has been pointed out at various seminars and workshops that tourism must have specific infrastructure, to facilitate the tourists requirements, such as transportation, banking, tourist police, proper road connectivity leading to beaches and other tourist destinations and its maintenance, hospitals and so on. The link that tourism establishes or provides with other sectors such as agriculture, industry and so on is equally significant in the context of overall economic development of the State. 16

**Tourist Income and Infrastructure Interdependence: A multiple regression model**

A multi-regression model, 17 explaining the relationship between tourist income and state of infrastructure in Goa have been devised so as to assess the future trend of tourism in terms of income. The income from tourism can be estimated by taking into account the factors/variables such as roads, transport, hotels, and electricity. Thus, income from tourism becomes the dependent variable. The other independent variables such as roads, transport, hotels and electricity can be used to estimate the dependent variable and also to increase the accuracy of the estimate.

Since tourism depends on more than one factor/variable, simple estimating equations will not give the accurate estimate. Hence, multiple regression techniques is used as it allows using more of the information available to estimate dependent variable ie. the tourist income. Sometimes, the correlation between two variables may be insufficient to
determine a reliable estimating equation, yet, if, the data are added from more independent variables, it may be possible to determine an estimating equation that describes the relationship with greater accuracy.

In addition, in multiple regression one can look at each individual independent variable and test whether it contributes significantly to the way the regression describes the data. Multiple regression also fits curves as well as lines by using the technique of dummy variables. Even qualitative factors such as tourist nationalities can be included in multiple regression. This technique will enable the investigator to analyze preference of the service providers.

For the sake of simplicity, the model represents only five variables (infrastructures), of which, tourist income is the dependent variable and other four independent variables expressed as $x_1, x_2, x_3$ and $x_4$ and represent the following:

- $x_1$ represents Road (in kms)
- $x_2$ represents number of Transport vehicles used by tourists
- $x_3$ represents number of Hotels
- $x_4$ represents Electricity consumption (in kwh)

The dependent variable $Y$ is the tourist income.

The data are collected for the years 1986-87 to 1998-99. However, data for some of the independent variables after 1998-99 are not available with the Department of Statistics, Planning & Implementation, Government of Goa.

Thus the estimating equation describing the relationship among the five variables is

$$\hat{Y} = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4$$

where
• $\hat{Y}$ = estimated value corresponding to the dependent variable.
• $a = Y$ intercept.
• $x_1, x_2, x_3$ and $x_4$ = values of four independent variables.
• $b_1, b_2, b_3$ and $b_4$ = slopes associated with $x_1, x_2, x_3$ and $x_4$. Which are calculated using Gauss’s Elimination Method.

The table No. 5.4 Temporal data of five parameters related to Tourism.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tourist Income (in Rs.Cr.) ($Y$)</th>
<th>Roads (in kms) ($x_1$)</th>
<th>No. of Tourist Vehicles ($x_2$)</th>
<th>Number of Hotels ($x_3$)</th>
<th>Total Electricity Consumption (in kwh) ($x_4$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986-87</td>
<td>486.21</td>
<td>6489</td>
<td>4566</td>
<td>252</td>
<td>3543.8</td>
</tr>
<tr>
<td>1987-88</td>
<td>479.74</td>
<td>7094</td>
<td>5082</td>
<td>274</td>
<td>3761.6</td>
</tr>
<tr>
<td>1988-89</td>
<td>477.01</td>
<td>7094</td>
<td>5797</td>
<td>278</td>
<td>7474.5</td>
</tr>
<tr>
<td>1989-90</td>
<td>519.93</td>
<td>7100</td>
<td>6895</td>
<td>310</td>
<td>7814</td>
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<tr>
<td>1990-91</td>
<td>430.52</td>
<td>7215</td>
<td>7591</td>
<td>350</td>
<td>7474</td>
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<td>1991-92</td>
<td>575.27</td>
<td>7300</td>
<td>8042</td>
<td>363</td>
<td>6023</td>
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<tr>
<td>1992-93</td>
<td>740.91</td>
<td>7543</td>
<td>8843</td>
<td>370</td>
<td>5343.9</td>
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<tr>
<td>1993-94</td>
<td>881.55</td>
<td>7600</td>
<td>9783</td>
<td>375</td>
<td>7970</td>
</tr>
<tr>
<td>1994-95</td>
<td>950.29</td>
<td>7800</td>
<td>10289</td>
<td>400</td>
<td>6717</td>
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<tr>
<td>1995-96</td>
<td>978.60</td>
<td>8522.65</td>
<td>10980</td>
<td>415</td>
<td>9305.27</td>
</tr>
<tr>
<td>1996-97</td>
<td>1067.77</td>
<td>8550</td>
<td>11612</td>
<td>436</td>
<td>9999</td>
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<td>1997-98</td>
<td>1116.79</td>
<td>9276</td>
<td>12280</td>
<td>1578</td>
<td>10179.3</td>
</tr>
<tr>
<td>1998-99</td>
<td>1148.52</td>
<td>9276</td>
<td>13122</td>
<td>1698</td>
<td>11117.5</td>
</tr>
</tbody>
</table>


Thus by using multiple regression analysis and solving the normal equations by using Gauss’s Elimination Method, the values of the constants are:

$a = -932.2622, \ b_1 = 0.1684, \ b_2 = 0.0724, \ b_3 = -0.0619, \ b_4 = -0.0299$
The equation of the trend curve is

\[ \hat{Y} = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 \]

Substituting for the values, we get

\[ \hat{Y} = -932.2662 + 0.1684x_1 + 0.0724x_2 - 0.0619x_3 - 0.0299x_4 \]

This equation shows that \( x_1 \) i.e. roads (in Km) and \( x_2 \) i.e. transport vehicles used by tourists will increase the estimated value \( \hat{Y} \) tourist income. As referred earlier in this chapter, road construction in terms of length, broadening of road, approach roads to tourist areas in the State, is highly essential to sustain the present tourism development. Similarly, the number of tourist vehicles for transportation is also less than what is needed for the tourism sector. This calls for more investment in road construction and transportation. At the same time any further construction of hotels represented by \( x_3 \) will reduce the estimated income from tourism. It can be interpreted that unless there is very high increase in number of tourist, the existing number of hotels/lodges, providing accommodation to tourists is enough and any increase in the number will reduce the estimated tourist income. This is to support the calculation of coefficient of variations in some of the areas in Goa (Refer Chapter – IV), which indicates high coefficient of variations in favour of hotels etc. at Colva, Benaulim (156), Calangute, Baga and Anjuna (188). These places are overcrowded, congested as shown in the pictures (Refer Chapter – III). The fourth variable \( x_4 \) pertains to total electricity consumption in the State, of which, tourism sector is a part. It is obvious that consumption of electricity by tourism sector is insignificant and hence, its contribution to income generation is negative.
The standard error of the estimate is

\[ S_e = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-k-1}} \]

where

- \( Y \) = sample value of the dependent variable
- \( \hat{Y} \) = corresponding estimated value from regression equation
- \( n \) = number of data points in sample
- \( k \) = number of independent variables

Denominator of the equation indicates that in multiple regression with \( k \) independent variables, standard error has \( n-k-1 \) degree of freedom.

Thus for the above data, Standard Error is

\[ S_e = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-k-1}} \]

\[ = \sqrt{\frac{65674.23}{8}} = Rs.90.60 \text{ Cr.} \]

with 8 degrees of freedom.

The standard error estimate and 't' distribution can be used to form 95% confidence interval around the estimated value i.e. \( \hat{Y} \).
\[(\hat{Y} - tS_e, \hat{Y} + tS_e)\]

where \(t\) can be found by using the table for \(t\) distribution with 8 degrees of freedom.

For year 2000-01, the confidence limits are

\[\hat{Y} - tS_e = 1215.64 - 2.306 \times 90.605 = 1186.705\]

And,

\[\hat{Y} + tS_e = 1215.64 + 2.306 \times 90.605 = 1424.57\]

With confidence interval as high as 95 per cent, the Government of Goa can feel certain that the income from tourism will be in this large interval from Rs.1186.70 Cr. To Rs.1424.57 Cr. for year 2000-01.

**Other Sectors**

**a. Agriculture**

Though conditions are favourable for agricultural development like copious rainfall with an average annual of 300 to 350 c.m., and the well-equipped State machinery to grow agricultural output, it is not self-sufficient. The main kharif crop is paddy cultivation, spread across 16,500 hectare in the State. The annual production is approximately 55,000 tons.\(^{18}\) This is quite insufficient as rice is the staple food. This forces the State to import large quantity of rice from other States. In addition to paddy, other crops that are grown include sugarcane, groundnut, some pulses but the production is so less that it would be appropriate to term the State as “Deficit State”, in respect of agricultural production. Agricultural and horticulture products like rice, sugarcane, vegetables, fruits, flower are
imported in huge quantities as there is growing demand for these products. The supply demand inequilibrium is responsible for increase in prices of these products in the local market, which is source for supplying these products to the tourism sector. Big and giant hotels and also some other establishments, many times import agricultural products on their own from neighbouring States and that cause rising import cost for their products, which reduces their profitability. This forces the tourists to pay higher price for the services received from the hoteliers, shacks, and restaurants in the State. Local population holds tourism as responsible for high cost of living in Goa.

It has been stated that the importance of agriculture as a source of gainful employment is declining significantly over the years due to various factors. One of the major factors is the large-scale land conversion for non-agricultural purposes, which is partly due to growth of tourism in the State, but mainly because of migration to Gulf countries. In this context, approximately 32 per cent of the local residents, presently engaged in tourism related activities, responded by stating that if not tourism, they would have gone back to agriculture. As tourism is a seasonal activity in Goa, they remain occupied for six to eight months and for the rest of the period, they either go back to agriculture and other activities or to private shipping companies for employment. Many have responded by stating that experience in tourism related activities help getting jobs in private shipping companies as well as in Gulf countries that are much more remunerative than taking up jobs in Goa or elsewhere in India. It has been also observed that this tendency to move particularly to Gulf countries or ships for employment is more among the Catholic youths than their counterpart in Hindu community.
Other factors include unremunerative prices of the products, lack of support system for storage, marketing facilities, and apathy of the educated members in the family to go in for agriculture, and so on. At present only 16.6 per cent of the population is engaged in agricultural sector and according to the experts in the Department of Agriculture, this per cent is going to come down further over the years unless measures are taken to check large-scale land conversion. Thus the most pathetic condition has been that of agriculture, the main component of the primary sector. The value added from agriculture in GSDP has declined from 16.5 per cent in 1960 to 7.3 percent in 1990-2000. More and more people are reluctant to take to agriculture. The economic survey for 2002-03 and 2003-04 reveal the major problem being faced today is the exodus of rural population to urban areas for employment, especially for white colour jobs, which partly due to educational background. According to 2001 census, around half of the state’s population are in the urban areas striving for a job. (Along the coastal areas, many go on the ship/overseas). This is contributory factor for downfall of agriculture. Demand for real estate especially along the coast has resulted too in large-scale land conversions and proportional decrease in land under agriculture.

The declining trend in work participation in agriculture has adversely affected the agrarian activity. The percentage of workers in this sector has declined from 60 per cent in 1960 to 27.5 percent in 1991 and to further 16.6 per cent in 2001. This is mainly due to the pressure on the land due to heavy urbanization and small land holdings, which are, according to survey, less economically viable. As there is dearth of agricultural activity, the number of agricultural labourers too has declined to 6.9 per cent from 10.9 per cent. This speaks loud of the pressure the urban areas of the State have been facing. The
agricultural labourers are not so educated to get a job in the urban areas for their sustenance.\textsuperscript{20}

Agriculture in Goa, especially along the coastal belt, has become marginalized with increasing importance being given to tourism, causing farmers to keep their land fallow to pursue other activities. Secondly, the craving of Goan youth for white colour jobs and in non-agricultural sectors has led to the steep rise in wages of agricultural labour in Goa. And though agriculture is claimed to be an important sector in Goa, it now accounts for only 15-16 per cent of the state’s income.

The overall agriculture scenario at the time of liberation in 1961 was that the agriculture workforce in Goa was 60 per cent, today, it is 24 per cent, and while the net domestic product from agriculture in 1961 was 16 per cent, today it is around 15 per cent, while at national level it is 30 per cent.

However, the agriculture sector in Goa does support more than 24 per cent of the state’s total population. But rapid urbanization as well as large-scale conversion of agricultural land for non-agricultural purposes has brought great pressure on agricultural land.

One of the main handicaps for agricultural development is that Goa has limited sources of irrigation and that 78 per cent of the present agriculture is rain-fed. Also, about 80 per cent of the agricultural land holding are between 0.5 to 2 hectare; rather small for commercial farming. Goans have not replaced the ruling variety, low-yield paddy, with the new hybrid high-yield varieties which give three times more (14 tons per hectare).\textsuperscript{21}

Other reasons are the low consumption of organic manure, fertilizer and bio-pesticides. The level of mechanization is low, wages of labour are high, there is lack of adequate marketing infrastructure and agriculture is not pursued as a full-time profession.
It is evident from these observations that link between agricultural and tourism is rather poor. In fact tourism has created negative effect on development of agriculture instead of being supportive to serve its own interest. Agricultural activities should be diversified and more attention should be given for production of tropical fruits like mango, jackfruit, cashew nuts, coconut, and different varieties of spices. In other words, more emphasis should be laid on development of agro-ecotourism. The Indian Council of Agricultural Research (ICAR) at Old Goa held a conference in January 2005 for developing agro-ecotourism in Goa due to natural limitations of agricultural production.

b. Industry

The industrial policy document of Government of Goa has been to ensure accelerated industrial development, economic and balanced regional growth with emphasis on protection of environment and sustainable employment for the local people. To achieve these, industry has been provided with an access to high quality infrastructure, extending institutional support, technology upgradation, deregulating business environment and an efficient proactive transparent administration. Incentives and benefits such as preferential and special capital contribution, interest subsidy, insurance cover, and other specific schemes like incentives to women entrepreneurs are being provided to industrial units in the State. Some of the features and schemes for industrial development in the State are as follows:

a) Early Bird Offer, introduced in 2003 envisages encouraging setting up of industries that have gone into commercial production within one year from the date of publication of the scheme.
b) Opening of facilitation counter at the Directorate of Industries for the public and computerization of the registration of SSI units.

c) 191 FDI proposals involving an investment of Rs.970.72 crore have been approved by the Government of Goa.

d) Constitution of an Empowered committee to formulate guidelines for grant of relief and concessions to various industrial and commercial units that have been declared sick, with a view to revive them.

e) During the year 2003-04, 101 SSI units permanently and 582 provisionally have been registered with an investment of Rs.4805.03 lakh providing employment to 5206 persons.

f) In all, as on 31.03.2004, there is 4169 SSI units in North Goa and 2683 SSI units in South Goa already established, covering various types of industries.

g) A High Powered Co-ordination Committee has cleared 345 industrial projects in Medium and Large Industrial Sectors with an investment of Rs.2368.26 crore generating an employment to 22,560 persons. Pharmaceutical industry has emerged as a major component in the industrial development of the State.

A close look at the Industrial policy, its features and the units that already exist in Goa reveal that Industrial sector has no close link to tourism and vice versa though tourism has been declared as an Industry in 1999. A handful of manufacturing industries under SSI are partly contributing to tourism, such as beverages, alcoholic drinks, food processing units like roasted cashew nut and so on. The industrial policy is certainly not tourism-oriented, however, there exists enormous opportunities for the growth of those industries that can directly cater to tourism sector requirements in the State.
Mining

Mining is an important economic activity in Goa. The entire mining belt of Goa covers an area of 700 sq.km. and is mostly concentrated in four taluks, namely, Bicholim, Salcete, Sanguem and Quepem. Goa is a major iron-ore exporting State and over 60 per cent of country’s iron-ore export is from Goa, earning foreign exchange to the tune of Rs.1000 crores per annum. Mining is done by open cast method, which necessitates the removal of over burden overlying the iron-ore formation. On an average, about 2.5 to 3 tons of mining waste is obtained, in order to produce one ton of iron ore. The average annual production of iron ore is about 15 million tons, in the process, 40 to 50 million tons of mining waste is generated. So, while it has ignited the economic activities enormously, it has also created a degraded environment and so is a matter of great concern not only for the Government but also, at the same time, for tourism development in the State. One of the major sources of pollution in the State is the mining sector. Mining activities are largely responsible for air, water and dust pollution. Large industrial houses mainly own these mines.

During the year 2003-04, special attention was paid in identifying the sources of pollution in order to adopt proper measures to minimize the adverse effects. These measures include the following:

1. Siltation of rivers in which the catchment areas of the rivers such as Khandepar, Selaulim, and Kushawati are periodically monitored and inspected and necessary directions are issued to the mining companies to take up adequate protective measures to control the turbidity of the water flowing into the rivers.
II. Dust pollution under which periodical meetings are convened with the mining companies in the presence of the Police and Transport authorities to ensure that all the tippers are not subjected to overloading and that they are properly covered with tarpaulin.

III. Damage to agricultural and horticultural lands in the vicinity of the mining areas affected by the activities are identified for appropriate measures.

However, the ground realities are different. Environmentalists, researchers, academicians and the public at large are very much opposed to the open cast mining and more particularly, the environmental damage that it is causing. The iron ore and other minerals like manganese are brought by tippers and shipped through the barges that use rivers for transporting the ores to Marmagao port. In this process, the rivers get polluted, and cause extensive damage not only to the surrounding areas but also the marine ecosystem. The tippers, which are over loaded, openly violate the rules set by the transport authorities. There is no checking by the RTO, and even if it is done, due to influence of the mine owners, the offences are sometimes ignored or escaped by paying minor penalties. Apart from this, the grounding of the vessel “River Princess” near Sinquerim beach since June 2000 has been a great concern with the successive Goa tourism ministers promising to lift it as it is dangerous to ecology and tourism alike. It is subsequently reported that the government would need at least Rs. 25 crore to remove the ship grounded since June 2000. The local people have reacted strongly by giving an ultimatum that if the government fails to remove the ship, they will come on the streets.24

Thus it can be concluded that there is lack of proper distinctive infrastructure that can specifically cater to tourist requirements exclusively and the linkage effect is not
satisfactory. The existing infrastructure is utilized both by the tourists and local residents. It is necessary that for proper tourism development in the State, exclusive tourist infrastructure, such as accessible roads, budget hotels and eateries, should be developed. The sky-bus project of the Konkan Railway could, not only have been an additional attraction to the tourists but would add to existing infrastructure that could have served the tourists exclusively, however, due to technical reasons the said project is now going to be discarded. Besides, planting saplings so as to minimize the environmental damage can beautify the unused mining areas. The crest of the unused mine can be developed as tourist attraction and for water sport, as has been done in some of the European countries. Tourism Master Plan: Goa 2011, a comprehensive tourism plan for the State by the Department of Tourism, Government of Goa has come out with an elaborate master plan for promotion of sustainable tourism, limiting its scope only to the coastal belt, assuming this as the primary site for future development, has failed to highlight the resources physical and financial and social, as an organic part of a holistic tourism development plan in the State. There is no special policy for development of tourism resources per se; and whatever facilities exist are enough to sustain the existing level of tourists coming to Goa. But if Goa has to vigorously promote tourism, as stated in the final report of the Master Plan: Goa 2011, with a growth rate of 5 per cent annually, the existing infrastructure must be upgraded, strengthened, and modernized. The report mainly comprises a study on “Carrying Capacity” to develop in the coastal belt of the State overlooking the potential of vast hinterland of the State for tourism activities.
REFERENCES

4. Ibid.
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