CHAPTER III

PERSONAL CARE AND ENVIRONMENTAL SANITATION

Hygiene both personal and environmental is important in the maintenance of health. Environmental sanitation is a major concern today. People are deeply worried about the way our world is rapidly being destroyed. Our environment is threatened by a host of man-made ills from toxic landfills to ozone depletion. In recent years, scientists have warned of the destructive effects of acid rain, deforestation, toxic waste, pollution of our oceans and rivers, extensive desertification and climatic warming. Major disasters like Chernobyl nuclear disaster, Bhopal gas tragedy, Texas oil spill and the more recent Arab Gulf oil slicks have set off alarm bells in public consciousness. The disasters have created dire health problems and ecological devastation. Today much attention is paid to green life, protected water and garbage disposal by scientific methods.

Few decades ago people were hardly aware of environmental problems. Chimneys belched out black smoke, refuse was seen scattered everywhere, poisonous effluents were
discharged freely into the rivers and oceans, destructive gases rose up into the atmosphere. And no one cared! In the past there were no problems of greenhouse effects and oil spills, but there were other important problems due to lack of certain facilities essential for the maintenance of health and hygiene.

During the Portuguese regime Goa was an unhealthy place due to lack of sanitation caused by scarcity of protected water, drainage system, proper toilets as well as means to dispose garbage and night soil. Hygiene was generally given a low priority. Lack of sanitation was a major cause of different diseases. Though much attention was paid to personal cleanliness probably on account of climatic conditions, habits and religious outlook, the inhabitants neglected their surroundings and general environment.

Majority of people lived in small, overcrowded and insanitary houses. Houses lacked basic amenities such as running water, drainage system or proper toilets. Protected water was scarce in Goa. The inhabitants depended on natural sources of water supply. These natural sources were often were highly contaminated and unfit for human consumption.

River banks, open fields, hills and streets were used to defecate. In some cases, even courtyards were used
for such purpose. The rivers were endangered with germs. There were no facilities for disposal of garbage. Garbage was dumped on the streets, open fields or rivers, making the whole area a dangerous place to live. In the absence of proper drainage system, water accumulated around the houses and lanes. Rural areas had many ponds, culverts and marshes with stagnant water. Very little was done to clean them and other water sources or to use disinfectants.

Since early days some legislative measures were issued to improve the sanitary conditions of the city of Goa and later of Panjim. But these measures were not strictly implemented, probably because of lack of finance, poor administration and community participation. The participation of the people was important for effectiveness of the legislation. Many defended insanitary practices, because they were economically advantageous. Dumping of cowdung near the houses to be used later as manure in the fields is one example.

Insanitary conditions led to diseases and pestilence. Diseases such as typhoid, gastro-enteritis, skin diseases, eye infection, malaria, encephalitis and intestinal infections took heavy toll of life. Repeated attacks of epidemics in the century made the Government concerned about the hygienic conditions in the territory.
Personal Hygiene

The inhabitants were clean in appearance. Travellers such as Linschoten who visited Goa in the sixteenth century, were greatly impressed by the level of personal cleanliness in Goa, specially of women folk.¹ Women used to bathe sometimes twice a day. They used sweet herbs, perfumes, frankincense and rubbed their bodies with sweet sanders. Pyrard de Laval remarks that unlike people of Africa, in India, people were free of body odour.² This was probably due to daily bathing.

The Hindus bathed everyday before lunch as religious rite. However, many times people of lower strata did not change to clean clothes after a bath. People made use of water when they eased themselves. They washed their hands before and after meals as well. People cleaned their teeth with leaves of a caju or a mango tree. Toothpaste or tooth powder was not known among the masses during a major part of the Portuguese rule. Betle was chewed presumably to keep the teeth strong and to prevent bad breath. In rural areas and coastal areas, people were fond of swimming in the rivers and the sea. The inhabitants took good care of their hair, using oil and washing it with herbs. Women maintained their hair long but men cut off their hair as often as every week.
Some of the personal needs were taken care of by barbers. The inhabitants availed of their services to clean their ears, nails, cut hair, shave off their beards and rub their legs. Barbers acted also as bleeders and surgeons. They followed their trade in the streets. The native inhabitants felt no embarrassment to use the services of the barbers on the streets. However, the fidalgos called them to their homes.

To protect themselves against excessive heat, the people often wore light clothes or dressed scantily. They changed their clothes often. The poor had limited number of clothes. Underwear was generally used only by members of the higher strata. Children moved about naked up to the age of seven as it was considered a healthy habit. 3

Adults of lower classes moved about in semi-naked conditions in rural and urban areas. Legislation preventing such practice was issued from time to time. A legislative measure dated 4th November 1913 forbade adults from appearing without proper clothes in towns of Goa, in headquarters of New Conquests and ferry wharfs of Betim, Durbate, Rachol, Sanvordem, D.Paula and Piligão. Those disobeying the orders in the capital city and towns were fined 2 tangas. In other places, they paid 1 tanga for the first time, 2 tangas for the
second time, and the third time the person was arrested and jailed. These orders were repeated in 1934.

The upper classes among the Christians in the present century wore western style clothes for formal occasions. This was unsuitable to the climate and harmful for health. In early 1930s several doctors including Baronio Monteiro, Peregrino Costa, Sales de Veiga Coutinho, Jose Filipe Meneses, Constancio Roque Monteiro and others established *Liga Econômico-Social da India Portuguesa* to combat certain aspects of the western culture, including the trend to wear heavy western clothes which did not suit our climate. The *Liga* condemned also the custom of wearing black for funerals and for mourning. It advised the people to wear sandals instead of socks and shoes. Many of its members wore cabayas which was considered a practical outfit specially for the doctors.

The clothes were washed regularly at a well, spring or river by the women folk. They would beat the clothes on a stone to clean them. The affluent people gave their clothes to mainatos (washermen). The lower strata of population did not have special night wear. The poor went around barefooted. The unhygienic consequences were easy to imagine as bare feet were exposed to hook-worms and other infections.
Housing and waste disposal

As already discussed in Chapter 1, housing standards varied from class to class. Although the upper strata in the society lived in spacious houses of stone and mud, some of the rooms of these houses were permanently closed. These made the room dark and airless. Store rooms were breeding grounds for rodents, which many times caused diseases, and even plague. Kitchens were usually situated at the back of the houses beyond sleeping area and close to the well and toilets. The houses of the middle class were often dirtier than of the despised poor, because of the middle class attitude to menial work. They were reluctant to handle dirt.

Despite abundance of space in rural areas, majority of its inhabitants, lived in poorly built and insanitary houses. Village housing promoted disease in several ways. Most houses were leaky, damp, ill ventilated and overcrowded. These houses were scantily furnished and lacked basic amenities. Fifteen to twenty people lived in a single squalid hut. Most villagers kept farm animals but few could afford sheds for them, so at least during rainy season people shared their living quarter with them. Very often, these animals were domiciled in the house all year around to prevent theft.
A typical house of the poor was made of mud and palm leaves with a thatched roof. Majority of these houses consisted of a single room, rarely of two or three rooms. The single room served as a living room, dining room, bedroom and kitchen. Fresh air could not circulate freely as there were no windows. The Government appears to have been concerned over the lack of ventilation in the houses. In 1847 the Government issued orders to the Municipality to fix the number of windows for each new house. Lack of ventilation was responsible for many diseases. The floors smeared with cowdung, helped breeding of flies, ants and other insects. Till the second half of the nineteenth century, some church floors too were covered with cowdung. The soft mud floors encouraged rats to burrow in them. These houses had no chimneys and consequently the inhabitants often suffered from eye, throat and lung problems caused by smoke. The insanitary atmosphere was mitigated only by strong sun. Walls of the houses were rarely cleaned or white washed. They were dark with kitchen smoke and soot.

During the influenza epidemic of 1918, it was found out that in a single hovel at Taleigao about 70 people lived together. The habit of keeping cows, fowls and goats in the houses is still followed in rural areas. Animal urine and dung created health problems. The houses were infested with rodents and insects. Overcrowding together with inadequate
sleeping arrangements helped the spread of transmittable diseases, especially since a sick member of a family could be rarely hospitalized.

Bakers and artisans such as potters, blacksmiths, goldsmiths and others carried on their trade in or around their homes. These conditions were not conducive to the good health of the children and adults. Most houses had no bathrooms and toilets.

The greatest problem perhaps was the disposal of human waste. Night soil has been one a major source of insanitary conditions and diseases both in villages and towns. It was a common practice to defecate in fields, river banks, bushes, hills and streets near human habitation. When it rained the parasites that thrived in human waste were washed into rivers, streams, wells and tanks. Indiscriminate defecation was greatly responsible for general ill health, promoting cholera, typhoid, fevers, hookworms and other helminthic infections.

Dr. Fryer, an English traveller, who visited Goa in the seventeenth century, refers to a curious habit of throwing excreta on the roof tops for the birds to do the cleaning. In some houses the courtyards were used for washing and these became breeding ground for mosquitoes, causing malaria as there was no water drainage. This water never evaporated
entirely leaving unhealthy and foul-smelling cesspool, injurious to the inhabitants.

Houses had no proper toilets. The upper class people in the capital town made use of pots, which were emptied by a class of scavengers known as bonguis. These bonguis brought from British India were employed to empty the waste pans in the rivers. This practice still continues in some areas of the capital city. Bonguis performed their job indifferently and their carelessness increased the health hazards. They carried pots on their heads. They were exposed to virulent germs and many of them acted as carriers.

Efforts to improve the disposal of night soil were not successful, despite a postura (Municipal order) which directed that all excreta were to be emptied only between 5 a.m. and early evening in the sea, that is, during low tide. Otherwise the high tide deposited everything back on the shore. Those who failed to follow the order were to be fined. As in the case of most regulations, the above regulation was not always enforced strictly. Dumping of excreta into the rivers and sea without proper treatment endangered the health of the people. Many times, the bonguis emptied their pots on the streets and drains meant for rain water, making living dangerous for the inhabitants.
Besides movable toilets, houses in Panjim and other areas had fixed dry toilets. These toilets were cleaned by pigs. The system of cleaning toilets by pigs was considered harmful to health, as these pigs were later consumed by the people.

In 1863 some individuals from Panjim put forward suggestions to improve the sanitary conditions in the city. Very often people tended to keep the night soil in the house the whole day, as they had no one to carry it to the river. It was suggested that one hundred blacks be brought from Angola to do the job. No action followed on the part of the Government due to alleged lack of finance. In the absence of better alternative the Medical Board (Junta de Saude) suggested that all excreta should be disinfected. Separate pots for solid and liquid excreta were to be distributed among the poor. Night soil carriers were to be employed to carry the excreta within twenty four hours. However, no improvement followed and epidemics continued to take a heavy toll of life year after year.

In 1950 less than three hundred and fifty houses had septic tanks. The highest number was in Panjim with one hundred and eighty-six septic tanks, followed by Mormugão.
Water Supply

Protected water which is essential for the diet and maintenance of health and hygiene was not readily available in Goa, during major part of the Portuguese regime. No efforts were made to supply water to the people by means of pipes. Throughout this period majority of the people had to be content with natural resources of water-supply, namely rains, rivers, springs and wells. Even the famous "Golden Goa" had no facility of running water during its heydays. The water supply was remarkably deficient. The inhabitants had to avail themselves of fresh water from two suburban springs one at S. Domingos and the other one at Banguenim.

Water from Banguenim spring was preferred for drinking. It was supposed to possess ingredients conducive to health. Pyrard remarks: "With regard to the water which is ordinarily drunk in the city and its suburbs, the best and the most wholesome as well as the lightest in my opinion is the one which is sought for a quarter of League's distance from the City where lies a great fountain of pure and humid water called Banguenim which issues from the rocks."11

The spring of Banguenim served the entire city. The water was carried by slaves in earthen vessels at five bazaru-cos a pot and sold in the main junction of the city. It would
have been far better if the authorities had supplied water to the city by means of pipes or aqueducts. It appears that the Government and slave owners were not in favour of such a step, as they would lose income, which they collected by sending slaves to sell the water in the city.\textsuperscript{12} Around Banguenim, there were many reservoirs where mainatos (washermen) and others washed their clothes.

The first attempt, to provide piped water to Goa city was made in 1535. For this purpose Nuno da Cunha issued an \textit{alvar\'a} to the Municipality of Goa in order to collect thousand \textit{pardaos} from the inhabitants of the city. It was planned to bring the water from the Spring of Our Lady of the Mount.\textsuperscript{13} Colonial politics also killed another proposal in 1601. It was proposed to start a limited project to direct the waters from Timmaya's tank above Trindade to the city below. The plan was aimed to provide water to the city during the hot summer months. The city during this period faced scarcity of water.\textsuperscript{14} Since the budget of the city could not fund the project, it decided to impose 1\% additional tax. The plan was approved by the King, but could not be implemented as the King disapproved the use of funds from 1\% revenue, which was reserved for works of charity (\textit{obras pias}).\textsuperscript{15}

In 1618 the Municipality of Goa issued a \textit{Postura} which forbade under penalty of five \textit{xerafins} from washing at the
bicás (water flow) of the two springs at Banguenim and S. Domingos. This measure was introduced to stop pollution of the water. 16

Two more attempts were made to provide the city of Goa with running water. Once in 1630 when Conde de Linhares granted a sum of six thousand xerafins for this purpose. 17 A second time at the end of the eighteenth century. 18 The religious of S. Domingos de Graça, S. Filipe Neri and Santo Agostinho offered 30,000 xerafins for the purpose and remaining was to be spent by the Municipality. 19 But the plan failed as many workers fell sick due to prevailing diseases.

Majority of native population all over Goa depended on wells for their water supply. In the Old Conquests upper classes had wells attached to their houses. These wells were built in the courtyards of the houses and sometimes close to the toilets. Wells were always kept open. Water from the wells was often unfit for human consumption as it contained chlorides, nitrites and decomposed organic matter.

These peculiar habits of the natives gave rise to sources of contamination. When a native went to the well, he did so to wash as well as to drink. Water was drawn with copper or mud vessels with the help of dirty ropes. Some wells also served to wash cattle. The lower class people had

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bath around the wells. The filthy water then seeped back into the well. These wells were not cleaned inside and outside.

Drinking water was seldom boiled, though drawn from the same wells and tanks that were used for watering animals and for washing clothes. Water was stored in mud pots and copper pots which had not been tinned for years. One of the causes of cholera in Goa was Tirtha (holy water) brought by pilgrims from Pandarpur and other places where cholera existed in endemic form. This holy water was frequently mixed with larger quantities of water in Goa and distributed to friends and relatives to drink.

In areas situated along the river banks, particularly in the New Conquests, people consumed contaminated water from the rivers. Even today in remote areas people drink water from rivers in the absence of better alternatives. The same rivers were used to transport or to dump waste. Most villages and towns had no sewage. Refuse was thrown into the lanes and backyards. This waste was washed away into water sources by rain. As a result, these sources were polluted.

Panjim, the new capital of Goa, depended on water of two springs till the end of the nineteenth century. Even the Military Hospital had no running water. Lack of water in the hospital greatly affected the maintenance of hygiene. Majori-
ty of inhabitants continued to use contaminated water from the wells. There is reference to attempts made in 1896 to provide Panjim with running water. This water was to be brought from Banguenim spring by means of pipes to Panjim.

Orders were issued by the Health Authorities at the end of the nineteenth century, to prevent people from bathing around the wells. These orders were repeated again in 1922, but they were hardly observed. No efforts were made to cover and flag the wells or to build saucer drains to carry the water. The only factor that saved the people in the midst of such situation was their natural immunization. The Portuguese made no effort to provide potable water and thereby to improve the health and hygiene.

In 1907, the Government earmarked 6,20,000$000 to start a scheme of water supply in Panjim, when it was realized that lack of water affected food, hygiene and growth of population. Mortality rate exceeded birth rate in Panjim during this period. In 1914 Panjim had one hundred wells with potable and others with contaminated water.

The improvement of environmental hygiene not only depended on financial, material and human resources, but also on the attitude of the masses. They were unco-operative and suspicious of any change that was introduced. When, for
instance, wells were opened, springs were cleaned and reservoirs built to tap water in the Sanguem Taluka, the people still preferred to use water from the rivers, rather than draw it from the wells. In order to attract them to the wells, pumps were set in many wells, but these stopped working due to carelessness.24

Water supply was a serious problem in Goa during the months of April and May. Lack of pure water was responsible for many diseases. As late as 1950s, only a small section of the population had access to protected water supply with pipes in Ilhas, Marmagoa and Margão talukas. In Panjim, two hundred and six houses and in Marmagoa fifty-one houses received tap water.25 In 1956 the Government approved a plan to provide tap water to several villages in Goa.

Environmental sanitation in urban Goa

The inhabitants of Goa throughout the Portuguese period displayed a remarkable indifference to environmental problems.

Goa and especially the city of Goa, was a dangerous place to live in during its "golden" days. The city of Goa was overpopulated, had no facilities of running water and drainage system. Garbage was found scattered all over the place. These conditions were responsible for various epidemics
that broke out at regular intervals throughout the early period. The geographical conditions of the city played an important role in the health and hygiene. The city was surrounded by chains of small hills which blocked the free movement of the breeze.\textsuperscript{26} Besides, the tropical climate favoured the spread of micro-organisms, which alone or in combination acted as agents of infectious diseases.

In 1542 two officials were appointed to maintain cleanliness of the city. They were given the powers to arrest the people polluting the place. However, it appears that they neglected their duties.\textsuperscript{27}

After 1570 the sanitary conditions of the city deteriorated.\textsuperscript{28} Besides being over populated the city was surrounded by marshes and stagnant pools of water. No attention was paid to hygiene, which was essential for the preservation of health.

Throwing out refuse from the house to the streets below was a common practice. The common people with the permission of the authorities, made use of the river banks to defecate. Although labour was cheap, the Government did not seem eager to take effective steps to remedy the situation. More than thirty years later, in the early seventeenth century, the Viceroy Ayres de Saldanha was forced to issue an \textit{alvara}
forbidding the people from throwing filth on the streets. The Viceroy directed the Senado (Municipality) to appoint a gentleman of good conscience and habits as an inspector to prevent people from throwing dirt in the city of Goa. 29

inspite of the measures introduced by the Municipality, the situation had worsened in the course of the years. To remedy the situation, the Municipality of Goa issued a postura on 3rd November 1618. This postura was valid upto mid-nineteenth century. It imposed several restrictions on the inhabitants of the City of Goa, so as to improve the hygiene of the city. 30

The postura forbade the inhabitants to dump filth in places other than those fixed by the Municipality for the purpose. A penalty of 100 reis was imposed on the defaulters. Half of this penalty would go to the Municipality and the other half to the denouncer. People throwing filth around See Cathedral and other churches were fined 5 pardaos. Anyone messing up the place had to pay 1 tostão. Furthermore, the inhabitants of the city were prevented from throwing dirty water between Rua Direita and Fortaleza in the drains meant for rain water. The city of Goa had a number of drains to carry rain water to the river.
During this period, it was common to see people frying fish and other foodstuff in the streets of the city of Goa. The *postura* of 1618 put an end to such practice because the smoke and the smell polluted the area. Anyone found frying fish was fined 2 *pardaos*. The inhabitants of the city were also forbidden to have cooking fire outside their houses.

No beef and pork could be sold in places other than those fixed by the Municipality. Those who failed to follow these orders were fined 20 *pardaos*. Lamb and mutton could not be sold to convents, hospitals and private individuals without prior license. It was forbidden under penalty to kill female pigs. The city regulations did not permit anyone to rear pigs or let them move within the city limits. All cattle to be slaughtered had to be registered at *Paco*.32

The *postura* of 1618 directed that dead animals should be buried away from the city. However, dead cats could be disposed of in the sea. It appears that many *tavernas* (liquor shops) and *boticas* (general stores) sold meat of dead horses which died of old age or disease. The *postura* put an end to such practice, as it was bad for health. Bread meant for public consumption had to be prepared under hygienic conditions.33
The city of Goa faced difficult times at the end of the seventeenth century on account of the economic problems and diseases. Eventually, by mid-eighteenth century, officials and other inhabitants left the city. Buildings were demolished and stones were carried to Panjim. Some buildings decayed due to lack of maintenance. Others were allowed to fall to ruin so that the owners could sell the material and obtain means of subsistence. The whole city was deserted. The city was an unhealthy place to live in due to prevailing endemic diseases. These diseases were caused by lack of environmental hygiene. There were dense trees. The soil was humid and full of dry leaves. Lack of water facilities and acute scarcity during the hot season had forced the inhabitants to build hundreds of wells almost as many as the people living in the city. When the city started to decay, many of these wells remained unused and uncleaned. They were covered with dry leaves and were responsible for diseases.

The above mentioned conditions forced the Government to introduce a few measures to improve the hygiene of the city. By an alvará dated 17th May 1777 the Governor of Estado da India ordered felling of trees in the city. Trees that could not be used for timber had to be burnt to purify the air. The alvará also ordered opening of more drains to carry rain water. The work was carried out despite high expenses. Sewers
and cesspools were cleaned. The cistern of St. Rock College was opened and cleaned.

By another order the Government directed the Municipality of Goa to close over 300 wells in the city of Goa. The lake of Carambolim was also a source of disease. The lake and the springs around were cleaned during this period.

In 1779 the Municipality of Goa appointed a committee comprising of the Chief physician, other physicians, army officials and judges to study the unhygienic conditions of the city of Goa and find out the probable causes. It was important to investigate these causes as they appeared to be responsible for several diseases specially the one that struck the people who spent the night in the city. Separate reports were submitted by various members of the committee. The chief Physician offered the following suggestions to improve environmental hygiene:

All wells which did not receive direct sunlight were to be closed. Drains attached to the convent of Santa Monica were to be cleaned every year. Toilets in unused houses were to be closed. No buildings should have small windows. These windows were to be opened in the direction of the breeze. Trees were to be felled because they did not allow penetration of
sunlight and were responsible for dry leaves scattered on the ground. 38

Apparently, the Government was concerned and interested in improving the conditions of the City of Goa. In 1779 it asked the Municipality of Goa to find out ways to improve the situation. 39 It directed that high walls should be built around the cemeteries not only to prevent pollution but also to prevent foul smell. Further, the Municipality was asked to light fires in the city to burn all the filth and to purify the air. It was expected that these measures would eradicate diseases prevailing in the city and make it possible for the people to live in the city at night. 40 James Forbes, a traveler who visited the city in 1784 remarked that the conditions of the city were really bad.

In mid-eighteenth century, the headquarters of the Government were finally shifted to Panjim, a small village on the banks of Mandovi. Just like the city of Goa, the new capital was an unhealthy place. Some areas in the new capital such as Fontainhas and Santa Inez were filthy and full of stagnant ponds of water. In 1853 the government was debating whether to fill up ponds belonging to Francisco Paula Fonseca at Fontainhas. During this period Panjim had only two narrow roads and was full of huts.
These areas resembled more a village than a town. The inhabitants lived together with their animals. There were pigsties and cowsheds in the compounds of the houses. Cattle and pigs moved freely on the streets.

The inhabitants of Panjim emptied garbage on the streets, as they had no alternative arrangements. Many small lanes were inaccessible in the morning on account of the excrement found there. This poisoned the atmosphere. Houses were overcrowded and small. The non-Christian houses had small windows.

In 1861 under pressure from various quarters, including the press, the Government was forced to adopt measures to improve the conditions of Panjim. Culverts and fields which were breeding grounds of mosquitoes at Santa Inez were filled up. Ponds close to the Phoenix spring and the one belonging to Francisco Paula Fonseca at Fontainhas were also covered. The latter emitted foul smell. Trees and shrubs near the river banks and springs were cleaned. Still the sanitary conditions of Panjim left much to be desired. The use of fish manure in the paddy field had been banned in 1795 by the Communidades de Ilhas. This practice was considered a health hazard.41

In the early twentieth century posturas were issued by Municipalities of various talukas in Goa to improve hygiene.42
One of the first urban posturas in this century was passed by the Municipal Council of Salcete in 1902. It prescribed rules to be observed in building houses. No construction work could be carried out without the license of the Municipality. Houses had to be white washed or painted before 30th November of every year in any colour other than white. The white colour was considered dazzling to the eye. Those disobeying the orders would be fined Rs.1.

Dogs, fowls and other animals were forbidden from straying on roads. Any animal found straying was to be captured by Municipal inspector or any other person. A penalty of Re. 1/2 was to be imposed. Dead animals could not be left on the roads. Dumping of manure near the houses was banned by the postura. Material emitting foul smell had to be destroyed away from dwellings.

Wells had to be maintained clean and were to be flagged 75 cms high. The inhabitants were forbidden from washing clothes and animals near the wells. Milk of sick animals could not be sold to the public. Begging was punishable by law.

Toilets had to be built thirty meters away from the roads, railways and public places. A fine of Rs.25 was to be
imposed on those not obeying the order. In case of complaint toilets could be demolished and moved elsewhere at the expense of the one who complained. A notice of eight days was to be issued to the owner.

Cowsheds and horse stables could not be built near the roads and public places. Those who failed to comply with these instructions were fined Rs.8.

The Municipal Council of Ilhas issued *Codigo das Posturas* on 15th September 1906 with 375 clauses. It sought to take some measures as noted below:

The inhabitants of Panjim were banned from throwing filth and dead animals in public places but the alternate arrangements made by the Government did not meet the needs of the city. There were only ten bullockcarts to carry garbage of the whole city. The garbage was collected in wooden containers often in bad shape. The system of collection had many drawbacks and lacked hygiene. The carts were always overflowing with garbage. The garbage was usually collected from areas occupied by the upper strata of the society. Places such as Alto de Guimarães and Bairro de Pilotos were completely neglected.
People using mobile toilets were required to use jars of porcelain, zinc, iron or wood covered with tar. Night soil had to be removed by *bonguis* between 4 a.m. to 7 a.m. and 7 p.m. to 10 p.m. failing which the owner was fined Rs 5. *Bonguis* still carried pots on their heads. Pots were to be emptied at Gaspar Dias river. All pots required to be covered before they were moved out of the house.

Several restrictions were imposed on sale of foodstuff, bakery, meat shops and restaurants. Foodstuff could not be sold in a paper other than white. A fine of Re. 1 was imposed on those selling foodstuff wrapped in newspapers. The sale of contaminated food in eating houses and pastry shops was banned. The owners were instructed to maintain their places specially the kitchen clean. Brass and copper vessels had to be tinned. The transgressor had to pay Re. 1 for the first time, Rs. 3 for the second time and Rs 4 for the third time. Owners of eating houses that failed to maintain cleanliness or prevented sanitary inspections were imposed a fine of Rs. 8.45

Bakers were directed to maintain their bakeries clean. Baked bread was to be placed on white sheets of cloth or clean baskets. No milk could be sold before it was checked by an inspector appointed by the Municipality. *Codigo das Posturas* initiated the process of collecting data about health, diseases and the number of people vaccinated in Ilhas taluka.
It appears that cows, ducks, turkeys and hens moved freely in the streets of the city. To put an end to this habit owners of cattle found straying had to pay 4 tangas and one tanga for the birds.

Cattle was not allowed to graze from Rua de Malaca onwards. Rearing of pigs was strictly forbidden in the capital. Although the Municipality banned such practice it made no provisions to provide the inhabitants with public toilets or funds to the owners of houses to build proper toilets. Cattle for consumption was to be slaughtered in a slaughter house. Meat had to be inspected before sale.

In Panjim death rate exceeded birth rate around 1907. This cause was attributed to lack of general sanitation and specially to scarcity of water. Lack of water affected nutrition, hygiene and growth of population. Therefore, the Government earmarked 62,0000$000 to start a scheme of water supply to Panjim. 46

The plague of 1907 in Panjim led the Government to appoint a committee consisting of Directors of Public Works Departments, Health Services and the President of the Municipality of Ihas to suggest new measures to improve the sanitation of the capital.
In 1917 the Municipality of Ilhas decided to engage the services of Jal Jahangir Chichgar from Bombay and residing in Panjim to remove the excreta and urine from the city. A contract was signed between him and the Municipality for the purpose. The excreta was to be collected twice a day in metallic jars. The expenses were to be met from the taxes collected for the purpose by the Municipality. Residents paying a rent of Rs. 5 had to contribute with 6 tangas, those paying rent upto Rs. 10 were taxed 10 tangas, above Rs. 20 paid one rupee and those whose rent was upto Rs 40 had to pay Rs 2. Houses that remained closed for a period of a month were exempted from the tax for that period.

The contractor was responsible for cleaning the jars at his own cost. In case the contractor failed in his duties the same had to be reported in writing to the Municipality for necessary action. The contractor was also responsible to maintain clean the public toilets as well as the ones in Government offices, hostels and boarding schools. He had to sign a contract with these institutions through the department of Accounts.

The collection was to be carried out in carts between 5 a.m. to 8 a.m. and between 8 p.m. and 11.30 p.m. The arrival of the cart was to be announced by hooting of a horn. Jars had to be painted and covered with a lid. Fines were to
be imposed on contractor whenever he failed in his duties. There were different fines for houses, Government offices and other places. The contract was for nine years.

A report from Health Services states that the Sanitary conditions of Panjim improved after the plague of 1919. Soon after the plague broke out certain measures were implemented. Wells were cleaned and disinfected. This reduced the incidence of typhoid and paratyphoid.48

During the third decade of this century, the capital town still had no protected water supply and drainage system connecting the houses. It also had no proper toilets. Drains along the streets were permanently clogged. The town had no sanitary police to maintain hygiene. The town resembled a village with its cowsheds, pigsties and coconut groves. Drains from the streets were connected with the river, and at high tide the water and filth returned to the drains. Radical changes were necessary.

The ground floors of many houses belonging to the merchants in Panjim were used to store grains. These places were breeding grounds for rats that caused plague. Besides rats, store rooms were infested with cockroaches. In 1920 the Director of Health Services suggested to the Government to ban storage of foodgrains in private houses and proposed that the
Government should build a granary. This granary could be used by merchants to store grain.\textsuperscript{49}

In 1935 a Sanitary Police was organized because of constant epidemics in Goa. The immediate aim was to improve the sanitation of the capital town. This was the first concrete step taken by the Government to see that an effective machinery was provided to look into the sanitary problems and to introduce measures to prevent spread of diseases. The Sanitary Police was effective in furthering the cause of vaccination. It initiated the process of collecting data about diseases.

The sanitary police had wide powers. It was under the charge of a Health Officer who was helped by a nurse and two other workers. Additional staff could be recruited in times of emergency. The Sanitary Police was empowered to inspect only during day time houses, restaurants, bakeries, biscuit industries and others manufacturing foodstuff. In case of a residential house prior notice had to be issued to the inhabitants. Stagnant water around the house had to be cleared. No person could throw urine near the house. Houses had to be cleaned, white washed and open for ventilation. Markets were cleaned and washed daily. Shops selling cold drinks were asked to use protected water. Sale of milk of sick cattle was banned. Persons suffering from tuberculosis,
leprosy and other contagious diseases could not be employed in bakeries and restaurants.

The sanitary police was responsible for implementing various sanitary posturas issued by the Municipality. The regulation of 1935 applied also to Bardez taluka. Expenditure involved in implementing the above mentioned measures were to be met by the taluka Municipalities. Many of these measures could not be implemented due to lack of necessary finance, material and human resources. Besides it was difficult to educate the masses concerning hygiene.

Environmental sanitation in rural Goa

Environmental hygiene in rural Goa was equally bad. Heaps of refuse was always seen scattered around threatening the lives of the people. In rural areas no attempt was made for the collection and disposal of household refuse. In some areas cowshed refuse was collected along with household refuse and piled in the backyard to be used as manure. This refuse attracted vermin and rodents.

Cattle, pigs and goats moved freely messing up the place. During rainy season roads were inaccessible. Most roads were in bad shape. In rainy season these roads were full
of stagnant water. Dead bodies of animals were often found on the roads.

One of the causes of insanitary conditions in rural areas were permanent ponds of stagnant water and lakes. The inhabitants of Taleigão were concerned about a lake in their locality. It was responsible for diseases in the area. The stagnant water was covered by dry leaves and dead plants. The lake was surrounded by dense trees.

Cemeteries in Goa were built in close proximity to human habitation. This constituted a health problem. To prevent such situation the Church issued a decree in 1779 providing guidelines to be followed when building cemeteries. In 1894 the Government issued orders to concerned authorities that in future all cemeteries should be built away from human habitation. Health officers were asked in 1896 to accompany taluka administrators during their visits to check the sanitary conditions of their talukas.

People of all communities were reluctant to adopt preventive measures which were introduced by the end of the nineteenth century to control diseases. They were reluctant to accept inoculation against cholera and smallpox.
In the beginning of the twentieth century several villages such as Chincegal, Motto Patim, Caranzai, Oxel, Sirxarem, Sonaulim and Talauli in Sanguem taluka disappeared from the map due to malaria, cholera and smallpox. Sanguem had dense forests and stagnant waters which led to malaria. The people lived in most unhygienic conditions.

On festive occasions food was cooked in large quantity in copper vessels. This food was kept exposed to flies and other insects. During the fairs sweets were exposed to flies and dust. These sweets were sold in coloured paper which was harmful for health. It was not unusual to notice food exposed in open utensils close to the toilets.

The conditions in which food was cooked in restaurants and other eating places was unsatisfactory. Bread was baked in most unhygienic conditions and in ill-ventilated places. The dough for the bread was kneaded with feet because of large quantity and more pressure. This method contaminated the dough. The quality of meat available was poor. Generally meat of undernourished and diseased animals was sold.

One of the first Municipalities to issue Codigo das posturas was the Municipality of Sanquelim. It issued postura to improve the sanitation of the town. In 1908 few more clauses were added to this postura. The cleaning of the
houses, shops, cowsheds, wells and springs was made compulsory. This work was to be supervised by the Health Officer, Municipal doctor or regedor twice a month. It was the duty of the regedor to inform the Municipality the name of those who failed to comply with the orders. A penalty of 8 tangas was to be imposed on such individuals with the obligation of cleaning the place in the presence of the concerned authority.

The Municipality of Sanquelim issued guidelines to the working class who wished to build houses. All houses of this class had to face northeast. Every house was required to have a verandah in front and two rooms. One of these rooms had to face the verandah. It required to have two side windows and three doors. One of the doors had to open towards the verandah. These guidelines were applicable only to those who could afford to build such houses.

No cowsheds could be built in the vicinity of the house. Cowsheds had to be maintained clean. Dumping of cowdung near the houses was banned. The postura directed that palm leaves of all huts had to be changed with new ones every May before monsoons.

The Municipality of Ponda issued a postura on 25th April 1903 with 162 clauses and 4 tables. The Codigo for-
bade the inhabitants of Ponda to dump garbage and dead animals on the roadside. Any person found throwing garbage in public were to be fined Rs. 2. No dead animal could be thrown in well or in river. The guilty person was to be fined Re. 1 per animal. However, if the animal was small only Re. 1/2 was to be collected from him. Washing around the well was prohibited under penalty. House owners were asked to clean stagnant water around the house and to white wash the exterior of their houses as well as the compound walls. Those who failed to comply had to pay a fine of Rs. 2.

The Municipality of Canacona issued a detailed postura on 12th May 1908, covering all aspects of environmental hygiene. It had 136 clauses. By this postura the inhabitants were banned among other things from defecating in public places. Any person found answering the call of nature in public was to be fined Re. 1. Dumping of stones, garbage, wood and other material near the houses was strictly prohibited. The inhabitants of Canacona had to appear before the taluka headquarters properly dressed.53

Generally the Government appeared to be indifferent to the possible dangers facing the environment until recurrent epidemics broke out in the early the twentieth century. These epidemics of cholera, plague and smallpox forced the local Government to issue a regulation on 14th March 1913 concerning
environment hygiene. The regulation required all unused wells, tanks, culverts to be covered. Tanks, cisterns and wells were to be covered with a metallic net and pumps set in. The inhabitants were advised not to keep containers with water and food stuff exposed to nature. Vessels were to be emptied every two days to prevent breeding of mosquitoes.

Roofs of the houses, compounds and land around were to be cleaned twice a year. All empty boxes, coconut shells, husk and similar material had to be destroyed by setting fire to them. No houses could be built or repaired without the approval of the Municipality and Health authorities. Administrative and Health authorities were given permission to inspect shops and residences during day time. Any one disobeying the regulation could be penalized.

The regulation made provision for the appointment of a committee in each taluka to implement the measures. The committee would consist of taluka administrator, health officer and another member either from agricultural class or landed gentry. In addition certain number of workers were to be appointed to help the committee to execute the measures.

In 1950s the mining activities in New Conquests were responsible for deforestation and dust pollution in the mining areas. This pollution gave rise to various chest diseases
including tuberculosis. There was no legislation to control health problems caused by mining activities. However, regular check of the workers by health officers was carried out.

In July 1956 the local Government approved and implemented a legislative measure providing inspection of animals to be slaughtered, their meat and sub products. The regulation forbade slaughtering of animals without being checked by veterinary doctor or Health Officer. Animals such as cows, buffaloes and pigs had to be slaughtered in the slaughter house. Pigs could be killed privately provided it was done under hygienic conditions. No meat or fish could be sold without approval of competent authority.54

No significant environmental improvement took place during the Portuguese period. Major reasons for the lack of improvement were probably lack of finance, apathy on the part of the Government, poverty and lack of responsiveness among the people.

Personal hygiene was difficult to achieve when public sanitation was inadequate. The value of bathing, washing hands, hair and mouth was negative when water was polluted. In 1961 only few towns had protected water supply. The remaining population had to still depend on high polluted water from rivers and wells which were responsible for
typhoid, paratyphoid and cholera. Even where there was protected water supply, sewage and drainage facilities were not provided simultaneously. Inadequate maintenance of water system created health problems. Sewage facilities were introduced in Goa much after the Portuguese left the territory.

Sanitary conditions were closely associated with housing conditions. These conditions were responsible for many transmissible diseases. Improvement in housing was not possible due to high cost.

Proper toilets were few hundreds in towns and some villages. Even now soil disposal in many areas of the capital town and other parts of Goa is primitive and conducive to the spread of diseases and such hazards as presence of worms in the intestine. Public toilets are also few and badly maintained. People are exposed to uric acid and urine vapors discharged by the people in public places.

Garbage disposal continues to be a major problem. Overflowing waste bins, garbage dumped around street corners and footpaths, all unattended to for days, is a common sight and serious threat to our health. There are no incinerators to destroy garbage. Scavengers very often salvage papers and other material and sell to vegetable vendors for use. Garbage is collected from the towns and dumped carelessly in certain
areas. This litter attracts pests. Birds many times carry the waste from dumps and spread it around. Sun, rains, pigs and birds destroy a part of the filth. But, for these natural friends it would be difficult to live in Goa.
REFERENCES


(4) Boletim Oficial, no. 89, 7th November 1913. (Henceforth B.O.)

(5) B.O. no. 27, 3rd April 1934.

(6) BNL: S.A. 19946v -- Providencias para urbanizacao e o saneamento de Goa. The Government also advised the people to have a chimney in their kitchens.

(7) Relatorio dos Servicos de Saude 1919.

(8) Fryer, op.cit., p. 152.

(9) HAG: Ms. 7795 -- Livro de Posturas, fl 108.

(10) Census of 1950, pp. 139-175. Many houses even in the capital city of Goa still do not have proper toilets. Appendix C-1.

(11) Pyrard, op. cit., p. 111.

(12) Ibid., p. 54

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(15) HAG: *Monçôes do Reino*, 7, fl. 120. (Henceforth M.R.). Appendix C-2.

(16) HAG: Ms. 7795 -- *Livro de Posturas*, fl. 74.

(17) HAG: M.R. 14, fl. 168.

(18) HAG: M.R. 159 C, fls. 718-718v.


(20) *Relatório de Serviços de Saúde*, 1879, p. 28.

(21) HAG: Ms. 11670 -- *Correspondência diversa*, fl. 67. (Henceforth CD).

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(25) *Census* 1950, pp. 139 and 175.
(26) HAG: M.R. 190, fl. 744.

(27) A.P.O., Fasc. II, Nova Goa, 1857, p. 77. Appendix 3-B.


(30) HAG: Ms. 7795 -- Livro de Posturas, fl. 72.

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(37) HAG: Ms. 1214, fl. 13.

(38) Ibid., fl. 75.

(39) HAG: M.R. 159 C, fl. 721.

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(42) HAG: Ms. 11674 -- *Correspondencia Diversa*, fls. 3 and 15.


(45) Ibid., pp. 20-66.

(46) B.O. no. 39, 17th May 1907.

(47) LRE1 1917, Nova Goa, 1918, pp. 183-184.


(49) Ibid, p. 21.

(50) B.O., no. 8, 25th January 1935.


(52) *Codigo de Posturas do Concelho de Ponda*, 25th April 1903, pp. 2-4; HAG: CD, 11674, fl. 15 refers to a project to improve the sanitation of Margão; HAG : CD, 10471, fl. 43 indicates that Rs.100 were advanced to
the Satary administration in order to improve the conditions of the place.

(53) LREI 1909, Nova Goa, 1910, p. 98.

(54) LREI 1956, Nova Goa, 1958, p. 59.