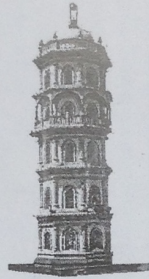


ATHARVA

Vol-I, No. 7 * December 1, 2006 * Free Copy
* Pages 24 * Ponda, Goa



MHADEI
THE GOAN LIFELINE IN PERIL

*A Monthly of Contemporary
Studies & Analyses*

Editor's Note

The intra-state or inter-state rivalries over sharing of river water are often used as a tool to mobilize the masses at political plane. The intensity of conflict multiplies when different parties rule the states. Or, a dispute turns out to be a weapon to confront the Centre.

The adjoining State of Karnataka share historical, cultural, ecological, and trade links with the State of Goa. The former Mysore State leaders asserted the cross-cultural exchanges during early 1960s. Since 1970s, Goa has become a hub of business activity. Goa is the second home for people from the adjoining states. The people form a strong bond between Goa and Karnataka.

A section of Karnataka leaders have adopted an inflexible stand over the Kalsa-Bhandura Project ignoring the legitimate concerns raised by Goa Government and violating the laws and the court order. Government of Goa is yet to convene a special assembly session over the serious issue. The all-party delegation formula is yet to yield results. The environmental groups are seeking the intervention of the high and mighty in the corridors of power.

The industrialization of Goa has put pressure on water resource on the one hand and depletion of water bodies on the other. The Mhadei diversion plans catering to demands of the urban pockets of Hubli-Dharwar area would be an ecologically insensitive course. Both the states have to explore the alternative routes to tide over the water scarcity in the future. The judicial or political intervention may yield results when the issue is decided on the ecologies of scale rather than on short term political or economic gains.

Mhadei: The Goan Lifeline in Peril

Rajendra P. Kerkar

(The author is a noted environmental activist, teacher and writer based in Goa)

Introduction

Rivers are the cradles of human civilization. The great civilizations have flourished on the banks of various rivers, world over. Eleven rivers and forty-two tributaries bless Goa, which is known as the 'Tropical Paradise'. Among these rivers, the Mandovi river is the biggest of rivers of Goa. Out of 3702 sq. km. geographical area, the Mandovi river basin in Goa occupies an area of 1580 sq. km. or 43 per cent of Goa's geographical area. In the ancient period, the Mandovi river was known as 'Gomati'. Goa too was known as 'Gomantak', on account of the role it played in the life of the people.

The River is a thing of grace and beauty, a mystery and a metaphor, a living organism whose processes have been perfecting through the ages, shaping our landscapes into works of art. Even today, this rives determine, where we live, what we eat, what we drink, and where we shake our legs. It supports life, carries life, and makes things possible for all living beings by supplying them with fresh water.

Prehistoric Settlement on Mhadei Basin

The discovery of prehistoric rock carving of a beautiful humped bull on the outcrop of basalt close to a rivulet near Ravalnath Temple of Mhaus village in Sattari taluka has brought this river on the rock-art in the State of Goa. Also, the discovery of the stone age tools like, chopper, hand-axes, cleaver in the forests of Tambdi-Surla on the banks of river Ragado and Dudhsagar from Sonavali to Shigao both the tributaries of Mandovi river have shown that the inhabitants resided on the Mandovi basin from time immemorial.

Origin of River Mhadei

The Mhadei river originates at Degao near Hemmadga-Shiroli of Khanapur taluka in Uttar Karnataka District of the State of Karnataka. At the origin, this river is the plethora of over 30 streams, surrounded by fan-shaped hills, graceful peaks, luxurious forests, and flat terraces of paddy fields at the base. The inhabitants of Sattari and Degao and other villages of Khanapur consider, Mhadei or Mahadayi or *Mandovi* as the Great Mother.

Indeed, such is the impact of the river in the culture, economy, and the life of the people. The people worship her as the *Great Mother*. The unique icons of mother goddess inside the boats in many villages from Savarle to Ganje and number of *Gajalaxami* (Elephant Goddess of Wealth) panels are scattered in the various parts of Sattari, Sanguem, Bicholim, Ponda talukas in Goa, indicate a great and popular cult of mother-goddess worship. The discovery of two *Gajalaxami* panels with royal emblem of Goa Kadamba at Gullem, in Sattari, shows that this region was once under the rule of Goa Kadambas.

Strategic Value of Mhadei

The promontories of Bardez and Salcete created by the estuaries of the Mandovi and Zuari rivers have bestowed on Goa a fine natural harbour with two anchorages, the southern one of Mormugao and its northern counter port at Aguada. The ancient ort of Gopakapattana (Goa Velha) on the banks of Zuari and Ela (Old Goa) on the banks of Mandovi have rendered useful services for encouraging trade links with the other parts of the world, since ages.

The seasonal port of Panaji on the banks of Mandovi is more of a jetty, where Goa-Mumbai streamers, fishing trawlers, passenger ferries and country crafts dock. Its well-knit drainage and long coast has gifted Goa with islands such as those of Chorao, Divar, St. Esteve, Cumbharjuve, Corjuve and others.

The promontories created by the estuaries of Mandovi possess immense strategic value as is evidenced from the fact that the historical rulers of Goa had built forts like Aguada, Reis Magos, Corjuve, St. Esteves, Nanuz amongst others. These forts helped the rulers to exercise control

over the enemy in the past. Thus, Mhadei river has given geo-political location and its strategic value not only attracted several rulers in the past, but, its strategic value will continue to attract the attention of the world in the future.

Mhadei: A Cost-Benefit Analysis

For Goans, Madovi river is the artery of the watershed, which supplies the nutrients necessary for the body to survive. This river, when it flows in its natural course, benefits all irrespective of caste, creed, or colour, wealth or poverty. In Sattari, from Uste to Ganje, people practising ‘*puran sheti*’ a primitive form of agriculture, which was once practised in the flood plain silt of the river in 27 villages.

From last two years, construction of bhandaras (bunds) by Water Resource Department has threatened the traditional agriculture. Mhadei has been the source of livelihood for hundreds of households in Sattari taluka and other parts of Goa. The winter crop Rabi or Vaigan rely solely on the Mhadei river. The tributaries of Mhadei have propped up several lift irrigation schemes, *vasant bhandaras*, which supports plantation of bananas, areca nuts, coconuts and other varieties of agricultural produce.

Table-I Drainage Areas of Important Tributaries of Mhadei in Goa

<i>Name of Tributary</i>	<i>Area (sq. km.)</i>
Madei	630
Kotrachi	95
Surla	75
Ragda	160
Khandepar	380
Kudne	65
Valvant	65
Bicholim	45
Assonora	55
Sinquerim	10
Total	1580

The drainage areas of the tributaries of Mhadei in Goa is as under:- Madei—630 sq. km; Kotrachi (95); Surla (75); Ragada (160); Khandepar (380); Kudne (65); Valvant (65); Bicholim (45); Assonora (55); and Sinqueri 10 sq. km., respectively. The total drainage area of these tributaries is 1580 sq.km.

Table-II Taluka-wise Break-up of Drainage Area of Mhadei river

<i>Taluka</i>	<i>Total Area of Taluka (sq. km.)</i>	<i>Area Under Drainage</i>
Bardez	265	146 (55 %)
Bicholim	236	225 (95 %)
Sattari	513	513 (100 %)
Tiswadi	166	108 (65 %)
Ponda	252	162 (64 %)
Sanguem	887	426 (48 %)

The taluka-wise drainage area of Mhadei river is as under: - Bardez--- 146 sq. km or 55 per cent; Bicholim (225 or 95 %); Sattari (513 or 100 %); Tiswadi (108 or 65 %); Ponda (162 or 64 %); and Sanguem 426 sq. km. or 48 per cent. Respectively.

Six talukas, namely, Sattari, Sanguem, Bicholim, Bardez, Tiswadi, Sanguem and Ponda fall in the Mhadei or Mandovi basin. Similarly, 192 villages lay in the Mandovi basin with cultivable land of 91072 Ha. The important towns of Goa lying within the basin or just adjacent to the basin and dependent on the Mandovi river for water supply are, include, Valpoi, Bicholim, Mapsa, Panaji, Ponda, and Margao.

Is Mandovi Basin Water Deficient?

The total length of Mandovi river is 87 km. The initial 35 km of the river is in the State of Karnataka and remaining 52 km. in Goa. There is long established navigation in the river in the

last each of 40 km. ferrying passengers and goods, especially iron ore. The traditional fishing sector has flourished along with tourism industry. The Mandovi river provides an infrastructure base for economic activities in the State. The Opa Water Treatment Plant on the Dudhsagar/ Khandepar meets the domestic commercial demands of water supply of Tiswadi and Ponda talukas.

The projected annual requirement of water of Goa State by 2051 AD is 2674 M. cum. whereas the water resources actually available in the Mandovi is only 1531 M.cum, as per the Master Plan prepared by the experts for Mhadei Basin in Goa. However, 1531 M.cum. include, the entire 75 per cent dependable waters generated in the upper reaches of the basin in the Karnataka (584 M.cum) and Maharashtra State (120 M.cum) and from 530 sq. km. foothill zones of Goa (827 M.cum.).

Water resources from remaining portions of Mandovi river basin in the final tidal and saline reach as well as coastal plains cannot be practically conserved and regulated. Thus, the Mandovi basin is a water deficient basin in the perspective of water resources development planning. Goa has to substantially depend on the water resources generated in the upper reaches of the basin in Karnataka and Maharashtra even to meet 1531 M. cum., which is only a part of its projected over all need of 2674 M.cum.

Side-effects of Mhadei River Diversion Scheme

Out of eleven rivers, Mandovi provides maximum portable waters to Goa. If any reduction takes place in the flow of river water, then it will increase salinity in a tidal river like Mandovi, which will alter marine life and the delicate ecological balance in the river basin. There will be huge increase in corrosion. Increased salinity will also negatively affect the breeding and spawning of various species of marine life.

Out of six wildlife sanctuaries and one national park, Mandovi river support the Mollem National Park, the Mahavir Wildlife Sanctuary of Sattari, the Bondla Wildlife Sanctuary of Ponda, and Dr. Salim Ali Bird Sanctuary of Tiswadi. The whole bio-diversity of these regions is relying on this river. Mangroves are salt tolerant forest eco-systems. They play an important role in the economic life of the local people and constitute reservoir for recreation services, fisheries activities and many other direct and indirect services.

Mangroves are silt-trappers, the cyclone-breakers, and flood-controllers. They are found mainly along the Mandovi and Zuari estuaries and Cumbharjuve canal in Goa. The reduction in flow of Mandovi river will adversely affect the people.

Mhadei River Water Diversion Schemes

(A) *Kalasa at Surla-Kankumbi*

Length of the dam: 340 mts.; Height: 32.40 mts.

(B) Haltara at Chorla

Length of the dam: 200mts.; height: 33.60 mts.

(C) Kalasa-Haltara Open-cut Channel of 1180 mts.

(D) Kalasa-Malaprabha Tunnel: 2550 mts & Open-cut Channel of 1740 mts.

(E) Bhandura (Nerse) at Khanapur: A dam for diversion of 3.20 TMC water

Ensuring Ecological Sanctity of Mhadei

The river valley of Mhadei, which forms the parts of boundaries of Karnataka, Maharashtra and Goa is ecologically very rich. It has been recognised as a level-1 Tiger Conservation Unit by WWF-International, Washington DC, one of the world's twelve ecological hotspot areas, one among eighteen mega-biodiversity regions in the world.

It is an important bird area marked by the Birdlife International, Cambridge. In 1998, a proposal was submitted to declare the Mhadei basin area as the Sahyadri Ecological Sensitive Areas. In 1999, the forest department of Karnataka State, too, submitted the proposal get these areas declared as the Bhimgad Wildlife Sanctuary. In 2001, Karnataka government intended to accord protection to this area by creating a biosphere reserve. This area is rich in flora and fauna and known to be the habitat for the striped tiger, black-panther, leopard, sloth bear, slender loris, malabar giant squirrel, pangolin, reptiles like the king cobra, bamboo pit viper, Indian coral snake, and amphibians like the malabar gliding frog, caecilian, etc.

The Barapeda caves of Talewadi near Degao is the only home to the wroughton's free-tailed bat, and endemic species of bat found nowhere else in the world. The Acri-cocri areas of Krishnapur have caves, which has one of the three homes in the Indian sub-continent to another rare bat called *tophous theobaldi*. The region is also very rich in the butterfly diversity with the largest butterfly of the southern Indian sub-continent, the southern birdwing and the smallest being grass jewel.

The Vajra-Sakhala water falls of Chorla Ghat and the Ladkecho water falls of Surla have the nesting sites of the white-backed vulture. The Mhadei Valley is also rich in the species of medicinal plants. The tropical evergreen forests, which is characterised by tall trees, dense canopy, sparse middle layer, climbing creepers and dense humus matting occur in strands in the deeper valleys of the Mhadei.

Move to Corner Goa Over Mhadei Issue

Karnataka is the upper-most riparian state of Mhadei river basin with a drainage area of 375 sq. km. located in Khanapur (Belgaum district) and Supa (Uttar Kanada). For the last three decades, State of Government put forth persistent demands for the diversion of Mhadei basin. From time to time, Karnataka government put forth plans of outside basin diversion from Katla and Palna tributaries of Dudhsagar river to Supa reservoir in Kali river basin of 3.85 TMC, diversion from Khandepar river to Supa reservoir, outside basin diversion from Kotni of Mhadei basin to Malaprabha river in Krishna basin, outside basin diversion from Kalsa and Haltar of Mhadei basin to Malaprabha and recent proposal for diversion of yield from Bhandura nalla by constructing a dam at Nerse in Khanapur taluka of Belgaum district, respectively.

However, Goa Government, from time to time had have opposed all the proposals of damming and diverting the tributaries of Mhadei and also the proposal of generating 345 MW

hydroelectricity at Kotni near Jamboti. The representatives of the three state governments are still working out for a viable solution to the contested claims. Karnataka government, however, unilaterally went ahead in May 2000 by announcing its decision to proceed ahead with the construction of Kalsa-Bhandura scheme for diverting 7.56 TMC of water to the Malaprabha sub-basin.

On April 30, 2002, the Ministry of Water Resources, Government of India conveyed in principle clearance from inter-state availability angle to Karnataka to meet the drinking water needs of Hubli, Dharwar cities. Chief Minister of Goa immediately appealed to the Prime Minister, for immediate personal intervention in the matter to restrain Karnataka government from its unilateral action, detrimental to Goa by taking all-party delegation. Looking at the grave concerns of the state government, the then prime minister asked the ministry of water resource to keep the letter in abeyance.

In 2006, once again Karnataka government declared its intention of going ahead with plans of Kalsa-Bhandura Project. Caught under severe pressure, there was no alternative left before Goa government except to approach the Supreme Court with a plea to direct union government to set up an inter-state water dispute tribunal to decide on the issue and to provide relief by bringing a stay order on the construction plans of Karnataka government.

When the matter came for the hearing in the Supreme Court on October 19, 2006, the advocate-general of Karnataka state assured the apex court that it would not go ahead with its plans for construction of dams on the occasion of Gandhi Jayanti on October 2, 2006. But, hastily, Karnataka government preponed its plans and went ahead with foundation ceremony on September 22, 2006 and after a month began its excavation work for open-cut channel and tunnel from the Temple of Mauli to Ambevhal, a stream, which drains the rain water available during the rainy season from the vicinity of the Temple of Rameshwar of Kunkumbi.

Simultaneously, Karnataka has also started the work of widening the course of Malaprabha river along with desilting it at Talavade. The state government allocated the necessary funds for the project and concentrated their attention on the speedy completion of the work, without taking the note of Goa government's protest. Chief Minister P. R. Rane immediately rushed to New Delhi and urged the Prime Minister Manmohan Singh for his intervention. Government of Goa has decided to file a contempt petition over the unconstitutional position of the Karnataka government. However, Goa government has decided not to pursue the contempt issue further.

Rationale Behind Diversion Plans?

In the name of drinking water for Hubli, Dharwar, Karnataka has initiated the Kalsa-Bhandura Project, but in reality, the adjoining state has an ambitious plan of multi-purpose project, which would cause a massive damage to the vulnerable Western Ghats forests and drastically alter the ecological balance of the Mandovi basin.

The scientist at National Institute of Oceanography, consider the Mandovi as strongly convergent system where fresh water inflow from upstream decays the tidal amplitude and checks the salinity. Damming and diversion plans are bound to disturb an intricate and complex river ecosystem, which have evolved over thousands of years.

Karnataka may undertake large-scale afforestation to compensate the loss of forests. But, compensatory forests consist of selected species, which will in no way match with the nature forests. To top it all, the nature forests have taken several thousands of years to evolve to its present state.

Conclusion

Anticipating various threats to the very existence of Goa, the *Mahadayi Bachao Abhiyan* (Save Mahadayi Campaign), Goa, in coordination with several other non-government organisations is actively mobilising the masses over this issue. The very survival of Goa depends on the waters of the Mahadayi permanently flowing into the Mandovi. Fulgencio Manoel da Silva, a Brazilian poet and social activists, who was martyred in Brazil, once rightly said:

“The river is life-water. What we do with it affects the life of the people, the life of the animals, the life of the people, the life of the waters. This is true for the world, not just for Brazil, but for the world.”

In this age of dam building and river engineering, what is the story that we are leaving behind? What will the river say of us?

REFERENCES

Alvares, Claude, 2002, *Fish, Curry and Rice, A Source Book on Goa: Its Ecology and Life-style*.

D' Souza, Richard, 2000, *Goa Forests: A Statistical Report*

Deuskar, V. R., May 1999, *Master Plan for Madei Mandovi, River Basin, Vol.-I*

Gune, V. T., 1979, *Gazetteer of Goa, Part-I*.

Kamat, Nandkumar, M, Articles appeared in daily, The Navhind Times from 1990 to 2006 on Mhadei issue

Kerkar, Rajemndra P, April, 2006, Special Issue on Mhadai

Kasbekar, Durgesh, October 25, 2002, *Mhadei Issue: Tribunal Not Wanted*, Gomantak Times.

National Environment Engineering Research Institute, Nagpur, March 1996, *Environmental Impact Assessment of Mahadayi Hydroelectric Project*.

[Kerkar, Rajendra P. **Mhadei**: The Goan Lifeline in Peril, Vol. I, No. 7, December 1, 2006, Ponda, Goa, India]
