MAHADAYI WATER DISPUTES TRIBUNAL

THE REPORT-CUM-DECISION

OF

THE MAHADAYI WATER DISPUTES TRIBUNAL
(Under Section 5(2) of The Inter-State River Water Disputes Act, 1956)

IN THE MATTER OF

REFERENCE NO. 1 OF 2011 RELATING TO WATER DISPUTES OF THE INTER-STATE RIVER MAHADAYI AND THE RIVER VALLEY THEREOF

BETWEEN

THE STATE OF GOA

AND

THE STATE OF KARNATAKA

AND

THE STATE OF MAHARASHTRA

VOLUME - II

(V O L U M E S I - XII)

New Delhi
14th August 2018

REPORT OF THE MAHADAYI WATER DISPUTES TRIBUNAL

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REPORT OF THE MAHADAYI WATER DISPUTES TRIBUNAL

S H O R T I N D E X

VOLUME – II

DETAILS OF THE PLEADINGS OF THE STATE OF GOA

36. The entire case pleaded by the State of Goa, emerging from (1) its statement of case dated February 4, 2013 (Volume 28); (2) Rejoinder dated July 15, 2013 (Volume 45) to the reply filed by the State of Karnataka to the Statement of Case of the State of Goa; (3) Rejoinder dated July 15, 2013 (Volume 45) to the reply filed by the State of Maharashtra to the Statement of Case of the State of Goa; (4) The amended Statement of Case dated March 7, 2014 (Volume 65) filed by the State of Goa; (5)Rejoinder dated April 16, 2014 (Volume 77) filed by the State of Goa to the reply filed by the State of Karnataka to the amended Statement of Case of the State of Goa; (6) Rejoinder filed by the State of Goa on March 3, 2014 (Volume 73A), to the reply filed by the State of Maharashtra, to the amended Statement of Case of the State of Goa; (7) Amended Statement of Case of the State of Goa filed on April 23, 2015 (Volume 131); (8) Rejoinder dated June 30, 2015 (Volume 150) filed by the State of Goa to the reply dated May 25, 2015 filed by the State of Karnataka to the amended Statement of Case of State of Goa; and (9) Rejoinder dated June 30, 2015 (Volume 148) filed by the

State of Goa to the additional reply filed by the State of Maharashtra on May 11, 2015, is as under:-

(i) According to the State of Goa, the present dispute is unlike any other inter-state River water dispute, which normally concerns sharing of waters between the states. It is maintained that the present dispute is not of that kind. It is pleaded by the State of Goa that the proposal in question of the state of Karnataka will result in a complete ecological disaster in which flora, fauna, hills, Ghats, Plains and predominant marine life, including mangroves and other species, which are alleged to be rare and protected, would be completely destroyed.

It is maintained that Goa is a beautiful State blessed with rich flora, fauna, tourism potential and thus, it is maintained that, in that sense, 'this dispute is of national importance'.

(ii) It is maintained by the State of Goa that a reference has to be made to certain peculiar, historical, geographical, and geological aspects, concerning the State of Goa, Mahadayi River, Mahadayi River Valley and Basin.

(iii) The State of Goa has pleaded that the Western Ghats are remarkable headwaters and the main watershed for the southern peninsula serving six States; sustained by the heavy seasonal rainfall from the south-west monsoon, from which all the major and many smaller rivers of the southern peninsula originate and flow east or west emptying into the coastal waters. It is averred that the real merit of the Western Ghats forests in terms of their watershed value is incalculable.

(iv) It is maintained that the State of Goa is the smallest of all the States in the country yet, it has a diversity of endemic species, habitats and ecosystems. It is mentioned that Goa is under the influence of two global biomes - the marine biome of the Arabian Sea and the terrestrial forest biome of the Western Ghats and within this balance there are a wide range of ecosystems and habitats e.g. forests, Ghats, alluvial plains, coasts, rivers, estuaries, mangroves, wetlands, etc.

(v) It has been described in the pleadings that the State of Goa has been divided into 4 physiographical sub-divisions by the Indian Council of Agricultural Resources, namely:

(a) Eastern hill ranges. The Western Ghats with continuous range of Sahayadri Hills forms the commencement of the high hill ranges of the East. The foot slopes of the range touch Ponda in Central Goa, Sattari in the North and almost the interior of Canacona in the South.

(b) Central rolling to undulating uplands. The central part of Goa from North to South connecting Pernem, Bicholim, Ponda and Eastern parts of Sanguem and Dharbandora and Quepem are occupied by undulating uplands having gentle to moderate slopes, intercepted by depressional landscape comprising valleys.

(c) Flood plains. The flood plains are of the two major rivers, namely, Mandovi and Zuari, which divide the coastal plains and the rolling uplands in the East and South East. These are occupying talukas of Tiswadi, Ponda and Part of Salcete.

(d) Coastal plains. The Western and South-Western parts of Goa constitute the coastal plains.

(vi) According to the pleadings of the State, so far as the Mandovi (the Mahadayi) river is concerned, the same apart from being one of the most important west flowing rivers of

Goa, is virtually the lifeline for the very sustenance of the State of Goa and its peoples. It is mentioned that the Mandovi river basin is an inter-State river basin draining areas in the States of Goa, Karnataka and Maharashtra and the river drains a total area of approximately 2032 sq.km., spread over the three States in approximately the following proportions:

a.	Goa	=	1580 sq. km. (78%)
b.	Karnataka	=	375 sq. km. (18%)
c.	Maharashtra	=	77 sq. km. (4%)
Total Drainage		=	2032 sq. km. (100%)

The State of Goa has pleaded that this river rises in Jamboti Ghat, about 10 Kilometers North-East of Sonasagar near Degaon Village in Khanapur Taluka, Belgaum district of Karnataka State, at an elevation of about 940 meters above the mean sea level and the river basin lies between latitudes 15^0 15'24" N and 15^0 42'00" N and longitudes 73^0 45'56" E and 74^0 23'54" E.

The State of Goa states that the length of River Mhadei within the State of Goa is 76 km. It is further stated that the length of the said River within the State of Karnataka is 35

km., and the total length of River Mhadei is 111 km. The State of Goa has further stated that as a result of the digitization of maps/plans, it is revealed that the length of the River up to which the salinity ingress impact is felt (i.e. up to Ganjem discharge measuring site) is 46 km. from the mouth of the river and there is a long established navigational network in the Mhadei River in the last reach of 46 km.

(vii) It is pleaded that the Mahadayi River in Karnataka is joined by three important tributaries, namely the Bail Nadi, the Kotni Nadi and the Bhandura Nalla and there are five important tributaries forming the Madei/Mandovi river in Goa portion, namely Surla (or Nanode Nadi), the Ragda, the Dicholi, the Mapuca and the Khandepar (or the Dudhsagar). It is informed that a branch (spill channel) of the Mandovi, the Cumbarjua Canal, connects the Mandovi to the Zuari River in its final reach.

(viii) It is stated that the Mandovi river basin can geologically be broadly divided into four distinct sub-regions west to east, namely:

(i) The coastal plains with dominant marine lands on the west.

(ii) The vast etch plain adjoining the coastal plains.

(iii) Low dissected denudational hills and table land.

(iv) Deeply dissected high Western Ghat denudational hills.

(ix) It is submitted that the mountain ranges running parallel to India's west coast receive heavy rainfall and thus have an immense water resources potential. It is averred that the States of Maharashtra, Goa, Karnataka, and Kerala share the western coast and several rivers originate in the higher altitudes of Western Ghats and cascade down the steep slopes and pour out in to Arabian Sea. According to State of Goa because of the topography of the mountains, width of all these basins is relatively small, and except two, all basins are within a State. It is stated that Mandovi and Netravati are the only two basins that are Inter-State and Mandovi is shared by three States, Goa, Karnataka, and Maharashtra,

while Netravati is shared by two States, Karnataka and Kerala.

It is submitted that the Mandovi River is a short length west flowing river on the West Coast of India. As per pleadings the main river originates in the Western Ghats of Karnataka, and runs for 35 km., in that state, before entering State of Goa, where in it flows for another 52 Km, before merging into Arabian Sea near Panaji. It is asserted that river basin of Mandovi River, occupies about 43% of the State of Goa.

(x) According to the State of Goa, the Mandovi river basin, in the State of Goa, can be broadly sub-divided into three zones or sub-regions based upon geographical utility features:

(i) The sub-region of about 530 sq.km., in the upper most region of river basin located in Goa (possible conservation zone).

(ii) The downstream of the conservation zone is the drainage area of the Mandovi river basin admeasuring about 541 sq.km. at low altitudes above the sea level,

where most of the population is concentrated in this region (population/Industrial zone).

(iii) A stretch/sub-region of 509 sq.km., of basin area in its final reach is in salinity and very fragile river zone. This is the area/sub-region, where river meets the Arabian Sea (salinity affected zone).

(xi) The State of Goa has pleaded that although, the drainage area of the basin within the State of Goa extends to approximately 1580 sq.km., it is neither possible, nor practicable to undertake any water conservation measures over the entire drainage area. According to the pleadings, the last stretch of 509 sq.km. (Salinity affected zone) is an environmentally fragile zone, primarily on account of the factors relating to high salinity and the eco-systems which develop with such salinity features. It is stated that besides, this stretch is used for navigation and means of access to the Panaji and Marmugao Ports and at present, salt water ingress and tidal influence is felt almost 36 Km upstream beyond Ganjem and this corresponds to almost 69% of the river's length within the State of Goa. Thus, it maintains that in the event, there is any alteration of the

river profile by the States of Karnataka and Maharashtra, then the same will result in drastic reduction in fresh water flow. It is further maintained that such reduction is a sure invitation for almost complete destruction of the river and the river basin and on account of such reduction, the saline water ingress and tidal influence will advance very significantly, i.e. even beyond Valpoi, which is almost 40 Km. upstream.

(xii) It has been asserted by the State of Goa that fresh water flow from any river restrains the extent to which salinity intrudes into that river and with global warming, the sea levels are bound to rise and this would consequently increase the extent of salinity ingress into the river. Thus, it is maintained that in the circumstances, an increased fresh water flow would be required to restrict this emerging global phenomenon and to restrict the intrusion of saline water to its present limits. Accordingly, it is stated that the saline water boundaries would be subjected to a dual mechanism of landward push due to reduced fresh water flow on one hand and increased sea level on the other hand, if the proposed diversion is permitted. Further, State

of Goa proceeds to state that the increased sea level would also cause increased intrusion in the ground water aquifer. It has been submitted that presently the salt water ingress and tidal influence are felt almost 36 km., from the mouth of the sea and diversion of water outside the basin by the State of Karnataka would cause the salt water to intrude further in, and thus reduce the effective catchment area and the usable yield further. Moreover, it is averred that the diversion of water outside the basin by the State of Karnataka would also reduce ground water recharge and result in increased intrusion of salt water in the aquifer.

(xiii) By way of a clarification, it is submitted that the Master Plan for Mhadei River Basin was prepared by a Panel of Experts appointed by the Government of Goa in the month of May 1999 and although the said Panel of Experts had calculated the requirement of water for different uses in the Mandovi River basin by 2050 AD, at 2674 Mcum i.e. 94.35 tmc, but it has now come to light, on the basis of further studies, that increased quantity of water would be required for meeting the various uses in River Mandovi by that period, much above what has been calculated by the

said Panel of Experts. It has been pointed that the said Panel of Experts itself had stated that upon carrying out of detailed project investigations of the various Irrigation Schemes proposed by the State of Goa (61 Schemes), 'it would be possible to better assess the various environmental impacts and assign a scheme of priority and acceptance of these projects to be taken up considering the entire Mandovi basin from the point of environmental aspects in comparison to the compelling need of water of the various areas served by the projects'.

It is, therefore, submitted that with the advances in the environmental and hydrological sciences, the State of Goa is in the process of undertaking more detailed studies and individual DPRs (Detailed Project Reports) relating to the aforesaid Irrigation Schemes in order to arrive at revised quantum of long term water requirement.

(xiv) It is submitted that the long-term water requirement is estimated not only for irrigation. Water is also required for hydro-power, drinking purpose, industrial use, environmental flows, inland navigation, salinity control

and maintenance of appropriate river morphology. Thus, a Detailed Project Report (DPR) can be prepared only for a 'project' and that too involving irrigation, hydro-power and drinking-water purpose. The State pleads that DPRs cannot be prepared for the use which is not a "project" viz. industrial use, environmental flows, inland navigation and for maintenance of appropriate river morphology. Therefore, it is maintained that Goa's long term water requirement cannot be determined only by what is stated in the DPR.It is further submitted that even for the irrigation, hydro-power and drinking water purposes, it is standard practice that the DPRs are prepared only upon estimate, as available and required at the time of conceiving of a project, which when taken up for construction may vary, depending upon the requirements, and other matters such as investment and related factors. It is stated that estimation of water needs is not done by preparing DPRs and therefore estimation of water needs cannot be restricted to the quantum reflected in the DPRs.

According to the State, it has already commissioned one more study for ascertaining the water requirement for

environmental flow, salinity control, inland navigation and river morphology.

The State of Goa reiterates that the proposed trans basin diversion of 24.15 tmc water from Mahadei basin for consumptive use would cause an irreparable and severe damage to it, as far as salinity ingress and tidal influences are concerned. It has been, thus, asserted that the State of Goa's requirements for water in the Mandovi River are for the human consumption – irrigation, domestic use, industrial use; and also for conservation of flora and fauna, for maintaining the appropriate river morphology for navigation, for sediment flushing, and to prevent salinity intrusion, both in the river and also in the aquifer and these environmental and morphological needs require maintaining an adequate flow in the river.

(xv) The State further describes that the second zone or sub-region, admeasuring about 541 sq.km. is a densely populated zone and there is a dense housing network, roads, public projects, Institutional and Industrial Complexes in this region. It has also been stated that there

is cultivation and agriculture in this region and any attempt at water conservation in this region, by engineering means, will result in submergence of this region/zone and consequently, prove to be counterproductive and as a matter of fact, there will be no area left even for rehabilitation purposes.

(xvi) The State has further narrated that despite difficulties, some projects, mainly to cater to the drinking water needs, had been set up at places like Sanquelim and Opa within the State. According to the State the alteration of the river/river basin profile by big States like Karnataka and Maharashtra, taking advantage of the geographical and geological position in which they are placed, would pose a very serious threat not only to the very sustenance of river/river basin, but also to the State of Goa and its peoples. It is further stated that the entire economic system, as also the ecological wealth in the form of Khazans, mangroves, agriculture, fisheries and navigation would be rendered critically vulnerable and the salinity enhancement would completely alter the river/river basin

profile, thereby destroying the prospects of agriculture, drinking water potential, etc.

(xvii) The pleadings further go on to assert that Mahadayi River Waters sustain forest and wildlife in Wildlife Sanctuaries and National Parks in the State of Goa, like Mahadayi Wildlife Sanctuary in Sattari Taluka; Bhagwan Mahavir Wildlife Sanctuary in Mollem, Sanguem Taluka; and Bondla Wildlife Sanctuary and any reduction in the Mahadayi waters would not only decimate the areas covered by Wildlife Sanctuaries and national parks admeasuring about 448.5 sq.km., but further will result in decimating the surrounding forests, particularly within the State of Karnataka, since the whole belt is one contiguous belt of forests and wilderness.

The State of Goa has submitted that the proposed diversion scheme of the State of Karnataka would cause severe and irreparable damage and loss to the forests, wildlife and other organic life in the Mhadei basin, particularly in the upstream areas. Goa submits that in the year 1999 part of the Mhadei basin area had been declared

as Mhadei wildlife sanctuary, under the provisions of the Wildlife Protection Act 1972 and the entire area of 208 sq. km. of the Mhadei Wildlife Sanctuary falls within the Mhadei basin and is also part of the Western Ghats, which are internationally recognized as a region of immense global importance for the conservation of bio diversity. It is pleaded that the said region contains areas of high zoological cultural, and aesthetic values, and has in fact been notified as one of the bio diversity hot spots. It is averred that besides the aforesaid, the water of River Mhadei sustains the forest and wildlife in various other Wildlife Sanctuaries and National Parks in the State of Goa, namely the Bhagwan Mahavir Wildlife Sanctuary in Mollem; Bondla Wildlife Sanctuary in Ponda Taluka; and Dr. Salim Ali Bird Sanctuary in Tiswadi Taluka. It is pointed out that River Mhadei is the only river which flows through the entire territory of the Mhadei Wildlife Sanctuary as well as the Bhagwan Mahavir National Park and Wildlife Sanctuary and the Bondla Wild Life Sanctuary.

(xviii) The pleadings of Goa further maintain that the major forest types observed in the Mhadei Wildlife Sanctuary include

Southern tropical wet evergreen forest, Southern tropical semi evergreen forest and Southern tropical moist deciduous forests and this part of the Mhadei basin has varying habitat types consisting of rocky cliff, high altitude vegetation at more than 800 meters above mean sea level, river bed vegetation, riparian forests, natural grasslands, lateritic plateaus and myristica swamps. It is submitted that the presence of aforesaid habitat types in this part of the Mhadei basin is greatly influenced by the prevailing moisture level and this micro climate plays an important role in maintaining and sustaining the growth of various species of flora and fauna in the region.

(xix) It is submitted that Kalasa River enters Goa as Surla River and flows as a huge water fall identified as “Ladke Cho Vazor”. Further, it is pointed out that besides the aforesaid, there are various other large and smaller water falls in this region which help in maintaining the moisture content in the region at the required levels, and which in turn helps in the sustenance and growth of flora and fauna in the said region.

It is submitted that due to the present flow of water, the required moisture or mist is generated, which helps in the growth of flora and fauna in the region. It is further submitted that the luxuriant growth of 'karivia collaosa' on the steep rocky area in this region, and more particularly near the water falls, helps to maintain the required water level of moisture in the form of mist and, the mist from the cascades of the said water falls, meets the water demands of the vegetation in this area. According to Goa, invertebrates require moisture in completing their life cycle and this area provides ideal breeding condition for such species thereby resulting in sustenance and flourishing of biodiversity in the region. Also, this part of the Mhadei basin is a nesting site for various endangered and critically endangered pieces of flora and fauna including long billed vulture.

According to the State of Goa, this part of Mhadei basin has been identified as a bio diversity hotspot, and is inhabited by the rare, endangered and threatened species. These species include:

- Some endemic butterfly species, which are site specific and are found in the wet evergreen and semi green forest of the region.
- Caecilians, frogs, fresh water species and other small endangered species. The present eco system also sustains ideal condition for breeding of various other animal species like clinotarsus, cuticeps or bicoloured frogs.
- The arboreal mammals like slender loris, flying squirrels and giant squirrels.
- The endangered Wroughton's free tailed bat and Theobald's tomb bat, which is on the rare species list.

It is submitted that Barapedi caves in the Mhadei valley is the only place where Wroughton's free tailed bat is found in the whole world.

(xx) The pleadings further state that river in its upper reaches plays an important role in adding nutrients into the food chain with its eroding action, the nutrients, which are trapped in river bank are dissolved in oxygenated water. It is submitted that if the proposed diversion scheme of

Karnataka is given effect to, it would result in changing the hydraulic characteristics of Mhadei River, reduction in flow of water in the river thereby disturbing the delicate balance required for sustenance and growth of habitat in the region. According to State of Goa, the water flow/moisture content presently available in the said region will be considerably reduced, varied or changed, and this would, severely and irreparably, affect the flora and fauna in the region. It is mentioned that certain species of fauna such as lepidopterans or butterflies are highly sensitive faunal components in the eco system and can react to the slightest variation in the climatic condition in the locality, whereas decrease in the moisture level in this area would also affect the survival of Malabar tree toads and Malabar gliding frogs thereby leading to local extinction of the species. It is mentioned that the arboreal mammals like slender loris, flying squirrels and giant squirrels play important role in the maintenance and disbursal of forest and any variation in the vegetation or insect fauna of this area would push such animals on the verge of local extinction.

(xxi) The State of Goa has asserted that the proposed diversion scheme of the State of Karnataka is in gross violation of the provisions of Section 29 of the Wildlife (Protection) Act, 1972 in as much as the same would severely result in destruction, exploitation, damage, diversion of habitat from the wildlife sanctuary and also diversion or stoppage of flow of water into and/or outside the wildlife sanctuary. The State of Goa further reiterates all its other objections as far as the proposed diversion scheme of State of Karnataka is concerned, by asserting that the State of Karnataka has not obtained at all the required clearances/ permissions under the various Environmental and Forest Legislations.

(xxii) The Goa State has pleaded that it has a geographical area of 3702 sq.km. Mandovi river basin in Goa occupies an area of 42.70% of the total Goa State's geographical area and this region abounds with six Talukas, comprising about 194 villages and has cultivable land to the extent of 91072 Ha., and flora, fauna and vegetation of 77975 Ha. It is averred that as per the 1991 Census, the population in the basin area was about 507468, which has significantly risen over the years and the most important towns in the State of Goa

lie within the basin or are on the Banks of River Mandovi. According to State of Goa the entire region is heavily dependent upon River Mandovi for drinking water needs in particular; the towns of Valpoi, Bicholim, Mapusa, Panaji and Ponda are dependent upon Mandovi/ Mahadayi river basin and the fresh waters therein for the purpose of drinking water and the Mandovi/Mahadayi river is the virtual lifeline for the entire State of Goa.

(xxiii) It is maintained that in contrast, hardly 375 sq.km. of the river basin area falls within the State of Karnataka and 77 sq.km., within the State of Maharashtra and these areas correspond to 0.20% and 0.025%, respectively, of the total State areas of those respective States. As set out earlier, according to State of Goa Mandovi river basin covers 42.70% of the total State area of the Goa State, whereas the further total length of the Mandovi River from the source to the Arabian Sea is about 87 Km. and the initial 35 Km., or thereabouts is in Karnataka and the remaining 52 Km., is in the State of Goa. The State of Goa has asserted that, it is almost entirely dependent upon this river and its basin for its drinking water needs, navigation, tourism, fishing, etc. It

is explained that the wellbeing, sustenance and even the basic existence of the inhabitants in the State of Goa is dependent upon this river and the river basin, but account of the fortuitous circumstance that the State of Goa is the lowermost riparian State and the States of Karnataka and Maharashtra are the uppermost riparian States, these States should not be permitted to virtually destroy and ruin the State of Goa and its inhabitants by undertaking measures which will prevent or in any case significantly reduce the fresh water flows into this river and basin.

(xxiv) It is pleaded that the Mahadayi river/river basin, is already a water deficit basin as per the Master Plan prepared by the Panel of Experts, the projected water requirement by 2051 A.D. would be 2674 Mcum., and the water resources actually available in the river/river basin would be in the range of 1532 Mcum.

Further, it is asserted that apart from the issue of deficit, any attempts for alteration of river profile in the uppermost reaches within the States of Karnataka and Maharashtra is bound to endanger the very sustenance of the river and its basin within the State of Goa. As stated

earlier, this river basin corresponds to 42.70% of the total of Goa State Area and in contrast, the river basin/drainage area within the States of Karnataka and Maharashtra corresponds to 0.2% and 0.025% of their respective total State Areas. From this, it is pleaded that it is apparent that the sustenance of the river and the river basin is virtually a sine qua non to the sustenance and survival of the very State of Goa and its people.

(xxv) Pleadings of the State further assert that the State of Goa has about 555 Km., of inland water ways, out of which about 255 Km., are navigable through rivers Mhadei and Zuari, including through the Cumbarjua canal and their respective tributaries. The State of Goa further states that out of their total length, the better part of these navigational channels is being used by the Mining and Export industry for transportation of iron ore to the Port of Marmugao from the loading points in the hinterlands. The State of Goa states that these internal waterways are natural waterways, which provide quick and navigational transportation facilities in the State of Goa for passengers, as well as cargo traffic and these channels are in existence

since times immemorial. It is mentioned that, it is pertinent to note that the Shipping Industry in Goa plays a pivotal role in the economic growth of not only the State, but also the Nation and additionally, tourism development activities are also taking place in these water ways throughout the State of Goa. The State of Goa further submits that there are various ferry routes in the State of Goa, such as Panaji to Betim, Ribandar to Chorao, Ribandar to Divar, Old Goa to Divar, Gaundale to Kumbarjua, Sarmonas to Marcel, Amona to Mayem, Narvem to Divar, Aldona to Kalvim, Aldona to Khorjuem etc., and all the aforesaid are on river Mhadei, and in addition to the aforesaid ferry boats, meant for passenger and vehicle transportation, there is continuous movement of barges, movement of launches, trawlers, other tourist boats, yachts, being an important tourist destination, as also, huge boats entering Panaji port, which require sufficient draft in the river, failing which the entire movement on the river, on which the economy of the State is heavily dependent, as also for the commutation of general public, will be severely affected. It is stated that the same cater to transportation of general public from one point to another, including some places where the only

option of travel to the main land is through a ferry route and, therefore, it can be emphatically stated that the inland water ways of Goa are a life line, to not just to the general public at large, but also to the financial, tourism and economic growth of the State of Goa. It is submitted that even a trifling damage to the inland water ways in the State of Goa will cause massive and disastrous results, affecting at a very large scale, the economic and financial growth of the State, in addition to causing hardships to the general public at large, and extensive damage to the very sensitive environment.

(xxvi) The State maintains that the activity of any kind of abstraction, including any kind of trans-basin or inter-basin diversion of Mahadayi river, by the States of Karnataka and Maharashtra is a matter of aggravating concern for the State of Goa and in the event the flow of Mahadayi River is restricted, or in any manner affected by the States of Maharashtra and Karnataka, the same shall have wide spread and absolutely negative impacts in the State of Goa.

Furthermore, it is mentioned that the present available depth within the navigational passage in the Mhadei River is 3.00 mts. over all and the movement of the vessels having the draught of 3.3 mts., is regulated to ply during the high-water period only, but in the event the flow of Mahadayi river is depleted to the slightest extent, the same will result in immediate reduction of the depth of the Mhadei river in the State of Goa, thereby affecting the movement of all the vessels, cargo, barges, launches as well as passengers even during the high-water period.

It is pointed out that the reduction of flow will also have a direct impact on the loading capacity of the barges, which are used by the mining industry for transportation of iron ore. The State of Goa states that the revenues directly earned by the State through the shipping and barge industry will be immediately affected, causing downturn in the revenue coffers of the State, as well as loss of precious foreign exchange to the country, thereby affecting the national economy. Furthermore, what is mentioned is that the domino effect will also be felt by the people dependent on the shipping and barge industry, thereby causing

hardships to the people at large. The State of Goa states that the Shipping and Barge Industry, including people directly and indirectly dependent on the same, are already yet to recover from the major financial loss, caused due to the Mining Ban for almost 3 years, which was imposed in the State of Goa. The State of Goa states that upon lifting of the ban, the people dependent on Shipping and Barge Industry are looking forward to make good the economic downturn. According to the State any attempt by the States of Karnataka and Maharashtra in diverting the waters of River Mahadayi will result in depletion of flow in the River, thereby directly affecting the Shipping and Barge Industry and ferry and boat services, causing further irrecoverable damage to the Industry. It is emphasized that mining exports earn valuable foreign exchange for the national economy.

(xxvii) It is maintained that the reduction in flow of Mahadayi river to the slightest levels will also raise safety concerns in as much as there are maximum chances of having casualties of the barges since the Masters of the vessels will be totally misguided in the navigational approach thereby grounding

or stranding of the vessels. It is averred that at any rate, there will be a devastating effect across the ferry services in the inland water ways thereby causing panicky situation amongst general public and commuters.

(xxviii) According to the pleadings the tourism activity in Goa has been booming since the late 1960's, and the State of Goa is regarded as one of the most preferred and best tourist destinations in the world. It is pleaded that in furtherance of keeping up with the progress in the tourism industry, the State of Goa has continuously endeavored to provide tourism related activities in the inner remote parts of the State, which are mostly connected through the inland water ways. The State of Goa has submitted that, as a result of such promoting of tourism related activities, the tourism potential in the interior parts of the State has been booming and the immediate effect of such booming would result in large scale tourism related activities being carried out on these inland water ways. The State of Goa further states that a large number of tourists visit such areas, thereby generating large amount of revenue for the State coffers, as well as providing valuable employment and

entrepreneurship to the local residents of the State of Goa and as these inland water ways form the backbone of such tourism related activity, any reduction in the flow of the Mhadei River will have large scale impact on the tourism related activities including to the extent of wiping out this industry, which has been set up by the State of Goa through manifest efforts.

(xxix) It is maintained that Panaji port is a seasonal port, which generally operates from mid-September to mid-May and the movement of barges and other water borne vessels is maintained in between Mhadei 0 river and Zuari river through the Cumbarjua canal. The State of Goa submits that this is possible as there is a proper flow of run-off coming from the Mhadei River, coupled with the incursion of tidal waters from the sea, resultantly causing the depth of the water to be just about sufficient for safe navigation through the Cumbarjua canal. It is, therefore, maintained that in the event the flow of Mhadei River is depleted to the slightest extent, the same will result in reduction of depth of the river and/or canal, thereby adversely affecting the movement of vessels even during the high-water period.

(xxx) According to the State of Goa there is already existing a massive problem of sedimentation in Mhadei River, due to the presence of silty clay, sandy silt, and beach sediments on the sea bed and the river bed, which is usually taken care by the flow of Mhadei River which flush out the sediments, in addition to the dredging carried out by the State of Goa. It is mentioned that in the event the flow of Mhadei River is depleted, the same will cause enhanced sand deposition at the mouth of Mhadei River, which would significantly affect the safe navigation during the fair-weather season. The State of Goa submits that even regular maintenance dredging will not suffice to ensure safe navigation, and any advanced levels of maintenance dragging used will be at very high cost making the entire operation economically unviable and furthermore, also cause damage to the fragile eco-system in the River.

The State of Goa, therefore, submits that the inland water ways of Goa are a life line of Goa and any attempt whatsoever to reduce the flow of Mhadei river, even to a minuscule extent, will cause the navigational traffic in inland water ways of Goa, to be completely disrupted and

such disruption will have disastrous effects on the economy of the State and Nation as well as the local residents.

(xxxi) It is maintained that the mining and export of mineral ore and tourism are the backbone of Goan economy and also make substantial contribution to the national GDP. It is explained that the Marmugao Port serves as an outlet for export of iron ore and the iron ore stocks are brought to the Marmugao Port through barges, which ply on the Mandovi and Zuari rivers. It is explained that the Marmugao Port, which is situated in Zuari basin, is connected to the Mhadei basin (Mandovi River) through a natural channel known as 'Cumbarjua Channel'. It is submitted that the Aguada bay of Mhadei River and the Cortalim bay of Zuari River culminates into and forms Marmugao bay, where the Marmugao Harbour is situated. It is further submitted that the navigational channel through the last stretch of River Mandovi extends into the sea and ends with the Port, which is located on the banks of River Zuari and there are 30 river loading jetties along the Mandovi River.

It is submitted that as at present, around 600 barges transit through this channel. Cumbarjua Channel is a natural channel having a length of about 17 km., and an existing draft (water depth) of approx. 2.60 mts., or more. It is submitted that smooth and safe passage of barges through the Cumbarjua Channel is possible as at present, since a draft (water depth) of 2.60 mts., or thereabouts, is available, but, the proposed diversion of water of river Mhadei will affect the existing draft of the river/Cumbarjua channel, and hamper smooth and safe navigation in the region.

(xxxii) According to the State of Goa, it is an acknowledged fact that every navigational channel runs the risk of sediment deposition in its channel, and the sediments entering the channel need to be flushed out by force of flowing water. Goa maintains that such sediments may enter the river not only from the upstream catchment but also from the sea side and flushing of sediments requires not only a particular depth of water but also certain amount of velocity or water flow. Thus, it is submitted that even in the present situation, there is a severe problem of sediment deposition

noticed between Diwar and Chorao islands and, therefore, any further reduction in the flow of river Mandovi due to the proposed diversion scheme of the State of Karnataka will only aggravate such sediment deposition, due to reduction in velocity/water flow in the Mandovi River and Cumbarjua Channel.

According to Goa, the flow of water from Mandovi through the Cumbarjua channel and then to Zuari and Marmugao Port helps flushing of sediments in the navigational reach, comprising of Cumbarjua, Zuari and Marmugao Port and, therefore, it is asserted that the Cumbarjua channel is not a natural interconnection between the two rivers, and water from Mandovi River flows down to Zuari River through the Cumbarjua channel.

(xxxiii) The State of Goa reiterates that the diversion of water from River Mhadei, which is proposed by the State of Karnataka would reduce the existing draft (water depth) critically and thereby affect the inland navigation, movement of iron or laden barges and other tourism related cruise liners in the

Mandovi River and more particularly in the Cumbarjua Channel.

(xxxiv) Goa continues to state that there are number of tributaries and sub-tributaries joining the river Mahadayi in all the three States. According to State of Goa, principal tributaries, State-wise, pertinent to the dispute, are:

A) In Karnataka; i) Bail Nadi; ii) Irti Nadi; iii) Katni Nadi; iv) Murudhuhaul Nalla; v) Pansher Nallah; vi) Andher Nallah, discharging directly in the main river; and vii) Haltar Nallah, flowing in Western direction in Maharashtra and joining down stream with Kattika Nallah, originating in that State.

B) In Goa: i) Nanode or Surla Nadi; ii) Kotrachi or Veluz Nadi; iii) Kudne Nadi; iv) Valvanti Nadi; v) Bicholim Nadi; vi) Mapusa Nadi; vii) Ragada or Gangem Nadi; viii) Dudhsagar or Khandepar Nadhi and ix) Sinkerim Nadi, discharging directly in the main river;

C) In Maharashtra: i) Haltara Nallah, originating in Karnataka, which flows in Maharashtra and is known as Virdi Nadi, and then in Goa, where it is known as Valvanti river; and ii) Kattika Nallah, meeting the main Virdi river near Virdi village in Maharashtra, and from their confluence flowing in South direction and joining Costi Nallah in Goa at Gontelli, forming Valvanti Nadi. In addition, there are small nallahs originating in Maharashtra joining Bicholim and Baga rivers which are tributaries of Mandovi River.

(xxxv) Giving the details of catchment area of river Mahadayi, the State of Goa has detailed that the core catchment area of the Mahadayi lies in the heavy rainfall (3800mm-5700mm per annum) thickly forested, approximately 200 sq.km., of mountain topography of Khanapur taluka, barely 10 km. upstream of Valpoi in Goa. It is stated that a very large quantity of water that flows down the Mandovi, all the year round, originates in the streams and rivulets around Kanakumbi, Jamboti, Talewadi, Gavali and Hemadga villages, where Karnataka's diversion and hydroelectric dams are to come up. It is explained that the Mandovi

River, Goa's lifeline, faces imminent threat of choking because of the reduction in water flow, siltation and disruption of its ecology, due to change in its profile - perhaps being even reduced to a trickle in the summer months. It is asserted that every variation in the Mahadayi water level will be crucial for Goa's ecology, forests, wildlife, agriculture, drinking water, fishing and transportation.

It is averred that the Mahadayi rises on the eastern slopes of the Sahyadri's crestline near Degaon village and the origin of the Mahadayi is a multitude of streams from within the fan shaped surrounding hills, capped by dense, pristine forests. It is stated that Bavali village also claims the origin of the river Mahadayi and the temple and tank near it at Gavli Village, is said to be the source of the Mahadayi. It is mentioned that it flows eastward for a short distance and then loops into an arc around the ridges and turns westward across the crestline into Goa where both, the Malaprabha and the Mahadayi run parallel to each other for some distance but flow in the opposite directions.

(xxxvi) Giving further details, it is stated that between the Malaprabha river at Kanakumbi in the north, Khanapur to the east, Anmod Ghat on the Goa highway to the south and Mollem/Madei wildlife sanctuaries across the crestline in Goa to the west, the Mahadayi valley with its luxurious forest covers an area of approximately 750 sq.km. It is stated that the valley is studded with graceful peaks, deep gorges, thick pristine monsoon forests and flat terraces of paddy fields at the bottom.

It is explained that as many as 75 big and small streams join the Mahadayi at various stages increasing its volume and velocity and the main tributaries of the Mahadayi in the upper and middle catchment areas in Karnataka are small streams of an average length of 5 to 10 km., and as one follows the flow, they are: Right Bank: Bhandura Nala near Kongla, Singar Nala, Doli Nala, Kotni Nala, Irti Nala, Bail Nadi. Left Bank: Pansheer Nala, Madhuhalla Nala. It is explained that these two streams arise on the crest line astride Talewadi and rush down on either side of the Barapedi caves within a km of each other near Krishnapur in the lower loop.

It is stated that north of the loop near Kanakumbi in the catchment area of Malaprabha River, two potent streams - Kalasa and Surla (Bhandura Nala) join east of Chorla and flow across the crestline as Surla river in Goa emptying into the Madei above Valpoi at Nanode in Goa. It is explained that these two streams are very important and major streams that feed the Mahadayi river.

It is mentioned that the valley is a scenic treat and one of the richest reservoirs of biodiversity in the world and reflects the complexity in plant, animal and bird life and is home to endangered bat species. It is stated that the valley is comparable to the Silent valley of Kerala in its significance and an important biological and ecological remaining pocket in the Western Ghats where about thirty villages scattered over the area remain poor, ill-served and rejected in the midst of thick resource-rich forests.

According to State of Goa the ruins of Bhimgad, an old Maratha fort is located north-east of Mollem Wildlife Sanctuary in Goa and north of Dandeli Wildlife Sanctuary in

Uttara Kannada District of Karnataka and the area forms a core part of the Western Ghats.

It is explained that vertical rock cave amphitheaters of Krishnapur near Goa border are gigantic wall formations 1000-1500ft in height, and the caves are extremely difficult to access, and have remained untouched and are nature's secret providing haven to a large number of floral and faunal species. It is stated that the steep drop of over 300 meters near Krishnapur and over 400 meters near Bhimgad to the valley down below is breathtaking and thereafter, the land rises to the north of the Mahadayi to peaks of about 700 meters at Kedi Paunda and Tamadi Mokh whereas 12 km., from Jamboti is Vajra Poha waterfalls and here the river Mahadayi is joined by two other streams - Maradha Nala and Pansheer Nala, creating the magnificent Vajra Poha waterfalls. It is stated that the Mahadayi takes a leap of over 150 ft. with rapids above and below the waterfalls and the village of Nersa in Khanapur nestles in the thick forests of Mahadayi valley. It is mentioned that one of the proposed dams is to be built close to this village

on Bhandura/Singar Nala confluence, submerging a sizeable area and threatening the very existence of this village.

(xxxvii) It is further stated that the Mahadayi River enters Goa near Khanapur taluka border, below Sosodurg (called Dara Singha peak on Karnataka side), the highest peak in the Sahyadris (1019 m.) in Goa. It is informed that in the upper reaches of the river in Sattari valley the river is called Madei and it flows for about 20 km., westward till it reaches Bembol, the point of its confluence with Khandepar river from where the river is called the Mandovi till it meets the Arabian sea ahead of Panaji.

(xxxviii) The pleadings continue to state that Sattari taluka is crisscrossed with innumerable streams flowing from the Western Ghats, from the Maharashtra state in the north and Karnataka in the west and prominent among them are four streams: Surla (or Nandode Nadi), Valvanti, Kotrachi Nadi and Ragada.

- Surla River (Nanode Nadi): Surla river originates in the dense forests of Surla and Kanakumbi in the Western Ghats of Karnataka. Kalasa Nala joins it before it enters

Goa. Two main streams join Surla River in Sattari - Mundrichi Nadi and Deuchi Nadi.

- Surla River joins Madei near the village of Nanode above Valpoi. The length of this stream in Sattari is about 20 km.
- Valvanti River: The Valvanti (Haltar/Virdi nallah/river) rises in the Western Ghats and enters Goa at Shiroli and it flows south for 21.5 km., and joins the Mandovi at Sarmanas. The river is subject to tidal influence up to Sanquelim. River Valvanti has three main tributaries: Costi Nadi (8.5 km.) joins the Valvanti at Ghoteli in Sattari. Cudne Nadi (17 km.) joins the Valvanti at Karkhajan. Dicholi (15 km.): originates in the Western Ghats of Maharashtra and enters Goa at Kudchirem to join the Valvanti at Karapur.
- Kotrachi Nadi: This stream emerges from the dense forests of Golali and Ivrem-Budruck. It flows southward and joins Madei at Velguem in Sattari.
- Ragada River: Originates in the Western Ghats and flows north-west over a distance of 35 kms and joins the Madei at Guleli. The Ragada itself has a tributary - Jamboli which starts at the Karnataka border runs

westward till Jamboli and then north-west to join the Ragada.

- The other important streams that join the Madei in Sattari are: Kumbhtol (10.5 km.), Patwal (10 km.), Zarme (11.5 km.), Khotodem (9.5 km.) and Advoi (8 km.).

(xxxix) The pleadings continue to state that in Goa, after a restricted course through the flat-topped range, while receiving waters of the Valvanti coming from Ambekhol of Chorla Ghat, and as many other smaller streams join in, the Madei emerges into a more open valley and from Bembol to Pilgao takes a north westerly course for about 17 km., swinging towards the west to join the Arabian sea at Panaji and from Bembol, where it meets the river Khandepar, the Madei becomes the Mandovi.

It is mentioned that as the tributaries join in, in its estuarial region, it develops a broad and slow-moving course accompanied by remarkable changes in the landscape and drainage, characterised by the typical features of a drowned topography with the island of Divar

standing prominently in mid-course, with its northern counterpart, the island of Chorao, not looking so prominent as an island, because it is on the right bank of the Mandovi, encircled by the small but complex network of Mapusa river drainage. It is stated that Khandepar River in the south and Mapusa river network of drainage in the north are the important tributaries of Mandovi in Goa. It is informed that the Khandepar river originates in the Western Ghats on Karnataka side and enters Goa through the Castlerock heights, and plunges down as the beautiful Dudhsagar waterfalls.

According to the pleadings, it is also called the Dudhsagar river in this stretch, and after the falls, it runs in a deep valley for some distance, till the village of Colem turning north to Colem Nala, a tributary which originates on the Karnataka boundary in the Western Ghats and runs westward till Pimpalquin and then turns north, till it joins the Dudhsagar (Khandepar) river, with a total length of 29 km. It is stated that Khandepar river valley is broad with alluvial embankments, and is dominated by plateau heights occasionally showing peaks and has a large drainage area

through its tributaries in the South, draining the area of north Sanguem and Ponda talukas in its wake.

It is mentioned that Mapusa River originates in the dense forests of Dumacem and Amthane and flows southward for 26 km., and joins the Mandovi at Penha de Franca whereas the Moide, a tributary of river Mapusa originates in Guirim flows northeast for 17 km., and joins the Mapusa River at Sircaim. What is stated is that the Mapusa river drainage consists of threaded and ill-defined streams in broad, flat and in some places marshy levels skirted by the Nandoli-Porvorim-Mapusa-Assonora-Sirigao plateau heights and shows that the whole low-level tract is infilled alluvium, fed by waters as well as debris by the steep down cutting rivulets of the plateau rims, of which the Assonora stream is the longest. It is asserted that the river starts from Alto-Porvorim hillock in Bardez and flows westward through Pilerne, Verem, Nerul, Candolim and joins the Mandovi at Sinquerim and the river length is 11 km. The church at the confluence of the Mapusa river and the Mandovi river stands very prominently on the river bank of the Mandovi.

(xl) According to pleadings, the Mandovi is the widest, approximately 4 km. at the Bay of Aguada and river Sinquerim joins it in this bay, whereas the Mapusa river joins the Mandovi at the upstream end of a 6 km., stretch, and Divar island, approximately 11 km., long, bifurcates the Mandovi into two channels. It is mentioned that before joining at the upstream end of the island, the two channels lead into an extensive network of narrow channels in a marshy area and the Cumbarjua canal joins the Mandovi about 4 km upstream of the Divar island. It is averred that the 30 km stretch of the main channel of the Mandovi, from the eastern edge of the Divar Island to Ganjem, gets progressively narrower and shallower in the upstream direction and rivers Dicholi, Volvonta, Kudnem and Khandepar join the Mandovi along this stretch, Khandepar being the largest of the four streams which is fed by the river Dudhsagar at its upstream end.

It is maintained that the core catchment area of the Mahadayi lies in the heavy rainfall, thickly forested, approximately 200 sq.km., of mountain topography of Khanapur taluka, barely 10 km., upstream of Valpoi in Goa,

where Karnataka's diversion and hydroelectric dams are to come up and the biggest ecological damage inflicted upon the Western Ghats is deforestation. It is claimed that the Western Ghats eco-region with an area of about 1,59,000 sq.km., has been classified as a global 'Hotspot', which means that this is an area which is rich in endemic plant species and which has already lost more than 70% of its original habitat and is under severe threat due to human pressure.

(xli) The State of Goa has expressed its apprehensions by stating that with water diversion and hydroelectric projects, the Mandovi river, Goa's life-line, faces imminent threat of choking because of the reduction in water flow, siltation and disruption of its ecology due to change in its profile - perhaps being even reduced to a trickle in the summer months, and possibility of seismic disturbances.

It is further stated that the main threat that is now looming over the valley is the Karnataka Government's plans to divert a large quantum of water from the Mahadayi River and its tributaries to the Malaprabha river basin, to

help the alleged water shortages in the Malaprabha basin, but as long as the exploitation of water resources continues in the Malaprabha region, no matter how much water, and from where it is diverted, the Malaprabha valley is likely to face the same situation in the near future. It is stated that the project is far more ambitious and it includes building as many as 11 dams on the Mahadayi and its tributaries in this small area along with hydroelectric projects. What is averred is that the project appears to aim at impounding a large portion of waters from the Mahadayi and its tributaries that flows into Goa, which will mean that Karnataka retains and controls all the dams and the Mahadayi waters, an exercise which will be impermissible under the Constitution in a federal structure like ours.

Pleadings maintain that it is estimated that this project will submerge a vast area amounting to about 3,000 Ha; most of it will be the thick forested area on Karnataka side of the valley and once these forests are destroyed there will be a drastic change in the ecology of the valley reducing the rainfall, ruining its forests, wildlife, and all its natural wealth.

(xlii) It is indicated that quite a number of ancient stone sculptures, representing the River Goddess have been discovered in and around the banks of the Mahadayi River, both in Khanapur, Karnataka, and in Goa indicating the existence of a dominating cult of the River Goddess in the area and the Boat Goddess sculptures depict the Goddess standing in a boat, holding a dagger in her right hand and a bowl in her left hand and is known by various names such as 'Naukayana' Devi (Boat Goddess), 'Ashtabhuja' (eight hands) Durga, 'Mahishasuramardini', etc.,and all these sculptures probably belong to Kadamba period (12th or 13th century AD). These sculptures have been found mostly in Sattari taluka at Nadve, Savarde, Dhamashe, Shel-Melawalli, Dhada and Guleli.

It is stated that Mahadayi River originates in Khanapur taluka of Karnataka, but for the people of Khanapur and the eastern taluka of Sattari in Goa, SHE is the MAHADAYI – "the Great Mother Goddess" as the name itself implies. Whereas the number of ancient carved images found scattered at Amagaon and Parvada in Khanapur Taluka and Sattari taluka of Goa at Caranzol, Savarde, Kodal, Rivem, Irvem, etc. represent the cult of the Mother Goddess

worship on the banks of the Madei. It is informed that the river Mahadayi becomes Madei in Sattari taluka of Goa and after the river Khandepar joins it at Bembol the river is called the Mandovi and like most monsoon-fed rivers, the Mahadayi also undergoes bewildering transformation during her seasons; slack, limpid pools of winter, partially dry beds of summer turning to fearsome torrents during the monsoons, submerging everything in its way and awesome in her destructive potential.

(xliii) In the pleadings Goa makes a grievance that Karnataka's unilateral decision to go ahead with the Mahadayi River Valley projects is now amounting to a very real threat and Karnataka is fully aware that the Mahadayi/Mandovi is a lifeline river for Goa and yet it is hell bent on diverting the Mahadayi waters into the Malaprabha basin. It is mentioned that most of the water from Karnataka's Naviluteertha reservoir on Malaprabha goes for irrigation of water guzzling crops like sugarcane in its upper reaches. Goa states that assuming, without in any manner admitting, that there is any Water Scarcity in Hubli-Dharwad region, then the same is due to the deliberate usage of water from

the Malaprabha Basin (Which was earmarked for drinking water purpose) for the purpose of irrigating the cash crops in the Hubli-Dharwad region.

It is stated that Goa has been at the mercy of its two larger and powerful neighbours and bordering states of Maharashtra to the north and Karnataka to the east and the south whereas most of Goa's major streams - Tiracol, Chapora, Mandovi, Surla, Ragada, Khandepar and Galgibag originate just across the border in the Western Ghats of either Maharashtra or Karnataka. According to State of Goa, for this reason, Goa is an extremely vulnerable state when its bigger neighbours draw ambitious plans to create large storages or divert waters close to the sources of rivers flowing into Goa. It is stated that the Mahadayi River Valley is one of the few remaining areas of wilderness in the Sahyadris and like the threats to these remaining wildernesses all over the world, this piece of wilderness is also facing several threats due to human pressure.

(xliv) According to the State of Goa, the Kalasa-Bhandura water diversion scheme, on which the work had already been

commenced, is going to submerge about 723 Ha (Kalasa 320 Ha & Bhandura 403 Ha). It has been stated that if Karnataka were to go ahead with the Kotni Hydroelectric & diversion project on the scale, that it has been planned, the total area to be submerged will be 2145 Ha forests plus another 330 Ha of forest land for roads, dams power houses, township, field offices, etc., and the villages that will be submerged, some of them completely, and some partially are: Kanakumbi, Parwad, Chorla, Kongla, Kirwale and Kabnail, Gavali, Pastoli, Nerse, Jamgaon, Mugwede, Chapoli, Jamgaon and Kavale.

It has been pointed out that the forest cover of Belgaum district would be reduced from 13% to 8%, after releasing the forest land to Mahadayi Diversion and Hydro-electric project and reduction in forest cover would have considerable effect on the climate - reduction in rainfall, temperature and humidity contributing to global warming.

(xlv) According to Goa what the Mahadayi project is set to do is to destroy permanently an area, rich in biodiversity, which ranks second in India after Sundarbans and eighth in the

world as the finest Tiger habitat, and is home to many species of flora and fauna, including endangered Wroughton's Free-tailed bat and Theobald's Tomb bat. It is maintained that Barapedi caves in the Mahadayi valley is the only place where Wroughton's Free-tailed bat is found in the whole world, and Theobald's Tomb bat is rare. It is stated that apart from Krishnapur caves it survives only in two other places in India.

(xlvi) In the pleadings of Goa, it is stated that the construction work on the Kalasa-Bhandura diversion dam for which the foundation stone was laid on September 22, 2006 at Kanakumbi, near Goa-Karnataka border, is progressing rapidly, and the project is threatening to wipe out this millennial old culture and society. It is maintained that Goa, although a small State, is one of the most prosperous States of the Indian Union, paying the highest per capita tax, and earns the highest per capita foreign exchange and mining, tourism, corporate taxes, income tax, excise etc. net about Rs. 8,000 crores per annum to the National Exchequer.

It is further stated that the change in the Mondovi's profile will also adversely alter the ecology of its estuarine, thickly populated islands of Chorao, Diwar, Corjuem, Jua, Cumbharjua, etc., whereas the state of Karnataka does not have any Environmental Clearance and the project is being carried out in violation of the Forest (Conservation) Act, 1980 and all other laws.

(xlvii) According to the pleadings of Goa the fresh water flow from the Mahadayi River in Khanapur taluka maintains the Mandovi and the Mandovi is a tidal estuary which means that it is an extended arm of the sea with tidal salt water intrusion but the fresh water flow keeps the salinity at a certain level and reduction in the fresh water flow will disturb the fresh water regime by pushing up the salinity to a much higher level.

It is maintained that the diversion of water by States of Karnataka and Maharashtra would have a devastating effect on the agriculture of Mhadei River Basin. It is stated that the Madei/Mhadei/Mhadei River is a perennial source of sweet water which runs about 76 km., within the state of

Goa, of which around 46 km., that is up to Ganjem is saline water, which leaves only 30 km., of fresh water within the state of Goa, spanning now seven (earlier six) potential Agriculture Talukas of the State of Goa in the Mhadei basin. It is averred that it runs across Sattari, Sanguem, Dharbandora (newly created), Ponda, Bicholim, Bardez and Tiswadi before meeting the Arabian Sea.

Further, it is stated that Mhadei River Basin comprises hilly terrain, agricultural land, alluvial plains, Ker lands, Morod land, Khazan land forms, wildlife sanctuary areas, forest areas, huge collection of Mangroves, flora and fauna, Western Ghats and many streams and tributaries further extend the coverage and utility of River Mhadei.

(xlviii) It is pleaded that Mhadei River Basin being a fertile Agriculture land with assured source of irrigation, many people have settled in this area from ages and taken up agriculture as their sole profession and only source of livelihood.

What is maintained is to enhance the utility of the available irrigation water, the ancestors had developed various innovative ideas like construction of bunds and Vassant bandaras, across the rivers to facilitate irrigation for Rabi and summer crops and they have also constructed sluice gates to control the intrusion of saline water. It is put forward that on the either sides of the river, the farmers have resorted to 'Puran Sheti' on the fertile alluvial soils in Sattari Taluka.

It is maintained that agriculture is an important economic activity for the farmers of this region. They are totally dependent on Agriculture as their main source of livelihood and the farmers have taken up subsidiary occupations like Dairy, Goatery, Rabbit Farming to supplement their income. It is stated that with the advent of new innovations in this Sector, the farmers have adapted to the new development in Agriculture.

(xlix) Goa maintains that River Mhadei is adored by the sons of this region as their mother and she nurtures them, and she is a witness to their progress since ages. According to State

of Goa, she is the cause of their pathway to the development and success and for all the reasons, she is 'Goddess' like the divine river Ganga.

It is further emphasized that what is referred to as "Jeevan" or "Amruta" in Hindu mythology is River Mhadei, which is rightly called the lifeline of the inhabitants.

According to the State of Goa any attempt, or proposed projects, which will have any consequence of either reduction or otherwise effecting the flow of water in Mhadei river, consequently, leading to reduction in its depth will have a drastic and permanent impact on the Agriculture Sector of this State. It is asserted that this effect will be unquantifiable, irreversible and would amount to negating the development done since ages and it can have a heavy toll on socio-economic front of the inhabitants and the State at large.

(l) As per the pleadings of Goa, the farmers in Mhadei River Basin area are hardworking and of innovative nature and they quickly adopt to modern agricultural practices. It is

informed that they have taken up many initiatives, owing to their working abilities and agriculture extension work by the State Agriculture Department of Government of Goa and they have taken up many agricultural development schemes of Government, anticipating good returns for them and their offsprings for years to come.

It is stated that agriculture is admittedly a premier national agro-industry of the country and the State of Goa has laid special emphasis on the Agriculture Sector. It is mentioned that indeed, the other two sectors of the economy, namely tertiary and secondary, are virtually interlinked and inter dependent on this sector and if the agricultural production is affected, it will create disastrous consequences, as a result of which taking any steps which in the process will consequently affect the Agricultural Sector, and the farmers in question, who are all dependent on the fresh water of Mhadei River for their agricultural plantations, will mean a complete negation of Article 14, as well as Article 19(1)(g) and Article 21 of the constitution of India. It is asserted that this will also hit the Directives Principles of State Policy, which are enshrined in part 4 of

the Constitution of India, envisaging a special emphasis on the agricultural sector as a means of production on the economy.

The state of Goa pleads that high handed and abrasive actions on the part of State of Karnataka and State of Maharashtra are and will directly affect the Fundamental Rights of the people of Goa, and more particularly the citizens inhabiting in the Mhadei Basin and such high handed unilateral actions of the State of Karnataka, diverting water, destruction of ecology, destroying agricultural activities, and endangering the livelihood of the citizens in the Mhadei river basin, is in complete breach of Article 14, Article 19(1) (g) and Article 21 of the Constitution of India.

The State of Goa has submitted that the state of Karnataka has acted most arbitrarily, high handedly unreasonably and in a most obnoxious manner and such conduct on the part of State of Karnataka is most depreciable because the State of Karnataka has directly infringed the Fundamental Rights of the citizens in the Mhadei basin. It is stated that the actions and attempts on

the part of state of Karnataka would result in taking away livelihood as also right of ecology and environment which is a facet of Article 21 of the Constitution of India. According to State of Goa the actions of Karnataka smack of a complete over-enthusiasm on their part, which by now is well known to be an abated enthusiasm for garnishing the sugar lobby in the State of Karnataka, and to augment the sugar production, that too at the cost of, and by violating the rights, privileges, and the rightful entitlements of the people living in the riparian States, which is an exercise impermissible in law.

The State of Goa states that the agricultural activities of cashew plantation, paddy, nachni, cash crops, mango plantation are the main crops for the farmers in the Mhadei River Basin and large scale cultivation of cashew crop adopting modern technology is possible due to assured supply of good quality water from Mhadei River. It is averred that the water requirements for raising of mango grafts and for mango processing industry are met from Mhadei River and its tributaries.

(li) The pleadings of Goa continue to state that the yields of rainfed plantation are very meager and scientifically, it has been proved that optimum irrigation right from December to May can double the coconut yields which in turn will have the adverse effect of mite infestation which could be substantially minimized by copious irrigation to bearing nut trees. It is pleaded that the size, copra content and oil content are better in irrigated coconut trees and the water requirement of coconut is very high and a nut bearing coconut tree requires about 60 liters of water every alternate day.

The State of Goa states that the farmers are irrigating their coconut crop by installing irrigation pumps, and drawing water from Mhadei River in addition to Lift Irrigation Schemes of Water Resources Department and the water stress to this crop will result into immature nut fall, reduction in size, copra and oil content. It is mentioned that the crop also becomes susceptible to many pests and diseases and termite infestation is very severe in water stressed areas which will culminate into substantial

reduction in production and productivity of coconut in the State.

State of Goa states that the coconut based Cropping System with coconut as the main crop, intermixed with Areca nut, Banana, Black pepper, Nutmeg, Pineapple, elephant's foot (Yam), etc. is followed in the State since ages, wherever sufficient irrigation source exist and the income source is assured since failure of any crop is compensated by other crops. There is effective utilization of soil moisture, land, sunlight, air in this system. It is pointed out that the biomass produced is decomposed and becomes rich organic manure, as a result, the soil becomes very fertile and productive.

The State of Goa submits that coconut farming is one of the major activities in the agricultural sector, and it is more prominent, apart from other parts in the state, in and around the Mhadei Basin area which is known for its fertility, and indeed, the volume production of coconuts is almost around 200 million in a year and Goa has around 40 lakh coconut trees in the entire state of which Mhadei

region has substantial share in the same, almost to the extent of 60% as it covers around 7 Talukas which predominantly has agriculture as its main source of economy.

(lii) The State of Goa has submitted that the 'Kulagors' are largely cultivated by the hard-working farmers of Mhadei River Basin which are totally dependent on this river water whereas the spices like Black Pepper, Nutmeg, Cinnamon, Cardamom, Kokum, Turmeric, Ginger are grown here and the spices fetch higher income to the farmers.

The State of Goa states that the value addition to spices have been initiated by many progressive farmers and have achieved greater success. It is mentioned that the White Pepper, Turmeric Powder, Nutmeg periapt pickle, Kokum Syrup, Kokum Candy, Nutmeg lace, etc. are the few examples whereas the coconut based cropping system has provided much needed employment to rural population. The state of Goa submits that coconut oil is the most health friendly edible oil.

(liii) The State of Goa states that the requirement of water is very critical during the planting phase from February to March which sometimes extends up to May also, and another critical phase is maturity phase from November to January, and the water stress during these critical stages lead into crop being subjected to lodging termite infestation which causes significant reduction in yield recovery.

The State of Goa further states that the vegetables are cultivated in Mhadei Basin areas by almost every household who owns even little land and the local vegetables like Bhindi, Cucumber, Chili, Cluster bean, Brinjal, Yam, etc. are cultivated in Kharif and Onion, Red Amaranthus, Radish, Palak, Wal, Brinjal, KnolKhol, Chili, Watermelon, etc. are cultivated in Rabi season, whereas the summer cultivation of Bhindi and Leafy vegetables is also done in some areas. It is mentioned that the Rabi and summer vegetables are irrigated from dugout ponds, wells and irrigation projects, Lift Irrigation Scheme and Mhadei River.

The State of Goa states that being short duration crops, they fetch immediate returns to the grower in addition to their own consumption.

The State of Goa states that as the root system of these crops is very fragile, they cannot withstand water stress or increase in water salinity and the crop physiology gets disturbed and the crop growth is adversely affected. The State of Goa states that the flowering, fruit set and fruit quality are affected and the yields are drastically reduced.

(liv) The State of Goa maintains that the Mhadei Basin areas are known for the aroma of local flowers like Jasmine (Jayo, Mogra), Crossandra (Ratan Aboli), Chrysanthemum, Champaca and Marigold which the locals grow them in their backyard, as these flowers are valued very much and in demand throughout the year and of late, high value flowers like Roses, Gerbera, Chrysanthemum, Carnations are commercially grown under the protected cultivation. According to the State of Goa, the local flowers are a source of livelihood to rural population who grow them in their

backyard and the source of irrigation is dugout ponds, wells and Mhadei River and its tributaries.

(lv) The State of Goa states that rice is one of the important components of “fish curry rice”, which is the main staple food of the majority population of the State, largely cultivated in Ker lands, Morod lands and Khazan Lands during Kharif season and for this reason, agriculture and rice cultivation, as well as supply of fish is required to keep pace with the increasing population, but any depletion of the water level in river Mhadei will necessarily cause depletion of marine resources, as well as an adverse effect on the agriculture, which includes rice cultivation. It is stressed that this will therefore, not only violate the basic fundamental, and human rights of the population of the state but will affect the standard of living drastically as well as create a vicious circle of disastrous consequences.

According to State of Goa this food pattern is a nature based phenomena in as much as, the gastronomic pattern as well as the system of body metabolism is fully dependent on this naturally supported diet, which is not only regarded as healthy, tasty, but also a well-accepted pattern of diet in

the coastal areas, as well as this region of Mhadei Basin. It is mentioned that the Rabi crop is possible in Ker lands wherever sufficient irrigation facility exists and some innovative farmers have even taken three crops in a year in the past. 'Puran Sheti' is done in Rabi season in Sattari Taluka, namely utilizing water from Mhadei River.

The State of Goa states that the local varieties of Paddy have been replaced by high yielding varieties and hybrids and the System of Rice Intensification (SRI) method is adopted in Mhadei Basin region which has increased the paddy yields by 25-30%.

The State of Goa states that the total Rabi cultivation of paddy is dependent on Mhadei River water and if the availability of this water is jeopardized, the cultivated area and production will be drastically reduced.

(lvi) The State of Goa states that if the sweet water natural flow is diverted or minimized, it is apprehended that during the high tide, the sea water will rise further to fill the void created due to reduction in the quantum of water in the

river and the sea will maintain the equilibrium by pushing the saline water further, thereby bringing more fresh Water Zone under the ambit of saline water. The State of Goa states that this will increase the salinity level of Mhadei River in the hinterland, and the seepage, streams will further pollute the fresh water ponds, wells and increase their salinity levels. It is pleaded that the basin areas will be subjected to saline water intrusion due to breaches in protective bunds in this region and this will further transform fertile lands into Khazan lands and invite associated problems in new areas. It is explained that, if such lands are left fallow, the mangroves will immediately take over and pose threat to agriculture development in this region.

The State of Goa states that one of the serious problem associated with increased level of salinity and water stress is the built up of some of the major pests and diseases that are averse to agriculture development.

(lvii) The State of Goa states that the incidence of black headed caterpillar is experienced more in coastal and saline belt

and this pest totally damages the coconut leaves and they appear to be naked. The yield drastically reduces.

The State of Goa further states that the incidence of termites is more when the soil moisture gets depleted and these termites affect the root system and stem part in coconut, cashew, mango, banana, pineapple, sugarcane crops. The State of Goa states that the coconut damages due to mite infestation is severe due to water stress in summer months but a good management practices including irrigation will minimize the damages due to mites, provided there is sufficient water in the Mhadei river.

The State of Goa states that the incidence of stem bores early shoot borers white woolly aphids, mealy bugs and scale insects in sugarcane is on the rise in water stress areas and Root Gruba, Rodents are more prevalent in drier areas as compared to moist areas.

The State of Goa states that in paddy cultivation, Armyworm, Hairy Caterpillar, Caseworm, Leaf folder, Gall

midge, etc. are more rampant and devastating when dry spells during monsoon are experienced.

The State of Goa maintains that if the crop is irrigated by providing life-saving irrigation, the crop damages can be reduced substantially.

The State of Goa states that the Khazan lands in the State are basically lands reclaimed by ancestors for centuries and are located along coastal alluvial plains of rivers, estuaries, etc., and network of massive external and internal bunds are constructed to protect, these Khazan lands from saline water intrusion.

(lviii) According to the State of Goa, the Mhadei River in the State generally flows through Taluks, namely Sattari, Bicholim, Bardez, Tiswadi, Ponda, Sanguem and now Dharbandora and these Talukas contribute to 1300 Ha of Khazan lands.

(lix) The State of Goa maintains that if the Mhadei River is diverted, then salty sea water will increase and Khazan lands will be affected due to seepage of the sea water and

even the salinity tolerant crops will not survive. It is stated that besides, fresh water table being affected by increased salinity, cultivation in Rabi season, including pulses will not be possible, and by diversion of Mhadei water, the fresh water Paddy fields will be transformed into khazan lands, thereby losing their fertility and yields. It is maintained that this will also encourage the growth of mangroves, thereby reducing the present command, and the diversion of Mhadei, thus will lead to wide spread of salinity in the khazan lands that will not only pollute wells, ponds, lakes, etc., but will render land unfit for cultivation. Hence, the State will permanently lose these lands which are evolution of labour works of our ancestors for hundreds of years.

It is emphasized that all these activities, are completely dependent, on the continuous flow of water in river Mhadei, and the requirement for all these activities of water is very high.

It is maintained that indeed, any reduction of water flow in Mhadei river will make the entire region very severely water stressed thereby not only affecting the

production and productivity of agricultural products but also the general crops, flora and fauna, and in fact, none of the tributaries in the region can, in any way help, make good the situation as most of these tributaries attain salinity after a particular level.

(lx) The State of Goa has asserted that all these activities are basically in the primary sector, and a huge network of workmen, farmers, persons belonging to lower income group, landless labourers, etc., who are heavily dependent on these activities and there is therefore direct and indirect dependence on the continuous flow of water in the Mhadei River. It is, thus, emphasized that in these circumstances, ignoring the rights of the persons living in the riparian states, surely, Karnataka cannot be allowed to divert the waters to another region, for the purpose of augmenting the sugar cane cultivation, through the so called camouflaged requirement of irrigation purposes, to the severe detriment of the settlements within the Mhadei basin.

The State of Goa submits that there shall be tremendous increase in unemployment in the State of Goa as people would lose their source of livelihood on which they are squarely dependent for several decades and probably through ages, and this in turn will give rise to loss of income and employment, and further breed inequalities in living and habitation, within the population in the region and will give rise to vicious economic cycle leading to poverty, having very severe social consequences and may even give rise to chaos and disorder in the society.

(lxi) It is asserted by Goa that all these activities are possible, and essential for survival and sustainability of flora and fauna, micro-organism, only if a particular flow of water level is maintained and in the same existing particular flow of water level particular organisms will grow, maybe for a particular time and die, survive and get eliminated, but this is a cycle of nature supported by the various factors in the cosmos, countenanced by Mother Earth.

It is pleaded that any decrease in the level of the flow of water will severely affect the flow, the life factors,

lifecycle, migration, food requirement, flora and fauna, habitation, breeding locations, seasonal migration, endangered species, and disturbances in life cycle requirements apart from the cascading effect generally on the environment as well as aberration of the protected ecosystem.

(lxii) The State of Goa also wishes to point out that the so-called encouragement which the state of Karnataka gives to the sugarcane cultivation, and on which spacious ground for irrigation purposes, Karnataka wants diversion of water, which at one point of time was feigned as drinking water purpose, has now been admitted after state of Goa exposed Karnataka's intentions.

(lxiii) According to the State of Goa, the whole of Sattari taluka depends on the waters of Madei for its agriculture including the centuries old method of 'Puran Sheti' and the Vasant Bandaras - lift irrigation employed by most of the villages. It is mentioned that these 27 odd villages will face a total ruin and Khazan lands are saline floodplains covering an area of about 17,500 Ha which have been reclaimed over centuries,

(Historical records of the 6th century mention Khazan lands), by constructing an intricate system of bunds (dykes) and sluice gates. It is pleaded that Khazan lands are ecologically, economically and socially very important for agriculture and piscine culture and this unique system is based on the ecology of the area that includes the present level of salinity of the water. It is asserted that about 2,000 Ha are under dense mangrove vegetation and the mangroves help to protect the outside of the mud and laterite bunds, that enclose the Khazan. Mussels, clams, oysters, crabs and prawns are harvested, and the fish and shellfish sustain a large population of indigenous and migratory birds.

It is emphasized that reduction in fresh water flow will push up the salinity to a much higher level which may result in the Khazan lands becoming unproductive, affecting thousands of people depending on the Khazan lands and as a result of shortage of water, staple produce of rice, pulses and cereals may get affected. It is stated that the the plantation crops such as cashew, coconut and areca nut which are largest plantation crops in Goa are bound to

suffer because the largest area of cashew plantations is located in the Madei/Mandovi river basin in the talukas of Sattari, Bicholim and Bardez. It is informed that the area under areca nut is 2,000 Ha and almost half of it is in Ponda taluka whereas other plantation crops grown in Goa are the bamboo, the banana and mango, bhirand or kokum. Kokum is also an important plantation crop which forms a part of daily diet and is used as a garnish to give an acidic taste to curries and vegetable as well as in the preparation of cooling kokum syrup during the hot summer months.

(lxiv) According to the State fishing is a major industry in Goa and over 40,000 people are dependent on fisheries for their livelihood. It is informed that out of 12 talukas of the state, fisherman from 8 talukas are involved in fishing and fish curry and rice is a staple food of Goan people. It is stated that the inland catch from the rivers in 2009 was 3,283MT as against the total catch of 83970 MT (2009) and there are landing centers for inland fisheries all along the banks of the Mandovi. It is asserted that the reduction in the water level and the deeper ingress of salt water will affect the fishing due to barriers to fish migration and this will reduce the fish

catch. According to State of Goa, the tourism industry in Goa depends on the local fish produce as well as flora, fauna, vegetation etc., which will definitely face problems.

It is pointed out that the mangroves also will be affected and the shellfish breeding will be depleted and the aqua farms along the river banks also will face problems.

(lxv) The State of Goa submits that the Mhadei plains of Goa comprise an intricate system of wetlands, tidal marshy areas, and cultivated paddy fields (khazans) all intersected by canals, inland dykes, bays, lagoons and creeks and the Mhadei River and its backwaters in the hinterland are governed by regular tides, which are felt up to 46 km., upstream. It is pleaded that the physicochemical conditions in the Mhadei River are influenced by two factors, viz. fresh water run off during the monsoon season, and the tidal influx of coastal water. It is pointed out that the Mhadei River is a tidal estuary which acts as an extended arm of sea with tidal sea water intrusion, and the fresh water flow keeps the salinity at certain acceptable levels. The State of Goa submits that this unique combination has resulted in a

manifestation of a unique and a completely fragile and highly sensitive aquatic eco-system and as such, it is highly dependent on the delicate balance of intrusion of sea water along with the mixing of fresh water thereby maintaining a very fine salinity level and such a delicate aquatic eco-system is completely unique and is completely dependent on the two forces of nature acting in tandem. The State of Goa states that any disturbance to either of the two forces of nature will have a massive repercussion on this aquatic eco-system thereby destroying the entire eco-system.

Accordingly, it is asserted that the reduction in fresh water flow in the Mhadei River as a result of abstraction of water from the river, whether for trans basin or inter basin diversion or for within the basin use by the State of Karnataka and or by State of Maharashtra will have devastating and detrimental effect on the Goa's entire eco-system, unique mangroves, agriculture and fisheries.

The State of Goa maintains that the Mhadei River supports rich and diversified flora and fauna and as far as the Fishing Industry is concerned, it is a complex mix of

artisanal, subsistence and traditional fisheries with diverse species, fishing gears, migratory fishers and fish merchants. It is pleaded that the estuarine complex of Mhadei River is the most prominent and supports a wide variety in terms of nursery and breeding grounds.

(lxvi) The State of Goa submits that the entire Mhadei River has a favourable coastline and equitable climate throughout the year, and the growth of mangroves along the coasts, as well as brackish water bodies, are influencing the growth of fish fauna on an unprecedented scale. Resultantly, it is pleaded that the State of Goa has a rich fish species diversity thereby sustaining a large Fishing Industry.

The State of Goa submits that Mhadei River is reported to inhabit large number of species of fish, and some of these species are Mugil cephalus (Mullets), Gerres filamentosus (Whipfin silver biddy), Gerres limbatus (Saddle back silver biddy), Sillago sihama (Silver whiting), Etroplus suratensis (Pearl spot), Arius-arius (catfish), Lutjanus argentimaculatus (Mangrove red snapper), Lutjanus russelli (Russell's snapper), Lutjanus fulviflamus

(Dory snapper), Lutjanus johni (John snapper), Acanthopagrus berda (Seabream), Elops saurus (Lady fish), Engraulis encrasicolus (Anchovy), Chanos-chanos (Milk fish), Megalps cyprinoides (Tarpon), Scatophagus argus (Scatophagus), Ambassis gymnocephalus (Ambasis), Sardinella longiceps (Sardines), Escualosa thorcata (White sardine), Galaxias maculates (White bait), Gerres subfasciatus (Silver bellies), Leiognathus bindus (Orange fin pony fish), Leiognathus daura (Golden stripped pony fish), Pempheris moluca (Molucam sweeper), Siganus canaliculatus (White spotted spine foot), Lethrinus nebulosus (Spangled emperor), Thunnus albacares (Yellowfin tuna), Thunnus tonggol (Longtail tuna), Dendrophysa russelli (Goatee croaker), Psettodes erumei (Indian spiny turbot), Tenualosa toil (Toli shad), Anodontostoma Chacunda (Chacunda gizzard-shad), etc.

The State of Goa further states that various varieties of Penaeid shrimps present in the river are Penaeus monodon (Tiger prawn), P. Semisulcatus (Flower prawn), P. indicus (White prawn), Penaeus Merguiensis (Banana prawn), Marsupenaeus japonicus (Kuruma shrimp), Metapenaeus affinis (Jinga shrimp), M. Dobsoni (Kadal

shrimp), M. Monoceros (Brown shrimp), Parapenaeopsis stylifera (Kiddi Shrimp). Shell fish and Crabs species include Charybdis cruciata (sea crab), C. Incifera, C. Feriotus, C. Natar, Portunus sanguinolentus (Three spot swimming crab), P. Pelagicus (Blue swimming crab), Matula lunaris (Sandy shore crab), Scylla serrata (Mud crab) are also found in Mahadayi estuary.

Furthermore, it is stated that Bivalves, such as Placuna placenta, Vilorita cyprinoids, Meretrix-meretrix, Meretrix casta, Paphia malabarica, Papiha textile, Catelysia opima and Marcia opima are also part of this fragile and sensitive acquatic eco-system. Gastropods such as Bursa sp, hemifusus sp, tibia-curta, Telescopium, Natica, Trochus radiates and many more are available.

According to State of Goa, Oysters species such as Crassostrea madrensis (Indian oyster), Saccostrea cucullata (Hooded oyster), and Mussels such as Perna viridis (Green mussel), freshwater mussel, are also present in the river. Cephalopods such as Sepiella inermis (Spineless cuttlefish), Sepia pharaonis (Pharaoh Cuttlefish), Panulirus polyphagous (Mud spiny lobster), Thenus orientalis (Sand lobster),

Panulirus sp., (Spiny lobster), Loligo duvaucelli, Loliolus investigatories and Octopus dolfusi, etc. are available in this River System.

(lxvii) The State of Goa states that some of these varieties and species of fish are exclusive to the aquatic Riverine eco-system of Mhadei River and as such, these fish varieties are completely dependent on a fragile aquatic eco-system, which is largely dependent on the fine balance of sea water and fresh water. The State of Goa emphatically submits that any such proposed abstraction/storage/dam/ diversion would cause a change in the natural flow regime of the river and will critically endanger all the precious and other species as a result of their habitat being destroyed, and also the physicochemical changes to the water in the River System.

(lxviii) The State of Goa submits that the annual inland fishing catch in the year 2013 was approximately 4,678 tonnes and the catch is brought to various fish landing centers by the fishermen and finally, this large variety of fish finds its way into the local markets all over Goa as well as the country.

The State of Goa states that fishing is one of the chief occupations and the source of livelihood for the people living in the State of Goa and for a population of roughly 1.5 million local residents, fish is a staple diet, and provides a source of rich protein food. Furthermore, it is informed that fish assumes greater significance to the people of Goa, as it forms one of the most important items of food of more than 90% of the population. What is stated is that, in fact, fish forms an integral part of Goan life and that fish and rice together form a staple food. It is informed that the 'Xit Coddi' (Fish Curry Rice), which is an important dish, is invariably a part of the daily meal in every Goan household and per capita/fish consumption in Goa is 7.4 kilograms, as against the national average of 5.00 kilograms, which points to the importance of Fishing Industry in the State of Goa.

lxix) The State of Goa submits that there are a total number of 30,225 fishermen in the State of Goa, out of which 11,944 are active and occupational fishermen and additionally, there are 1,82,821 fisher folks engaged in allied fishing activities including marketing of fish and other ancillary work. The State of Goa states that women outweighed men

in fishing activities in the State of Goa and as a matter of fact, out of 12 Talukas in the State, 8 Talukas are involved in fishing, which is an important economic activity, a source of livelihood for a large number of people. It is again stated that fish also constitutes a rich source of proteins particularly for poor people, and which is also the staple food for the people of Goa, and fishing activity is carried out in the sea, as well in the inland waterways, of which the Mhadei is a major river.

The State of Goa states that inland fishing is mainly carried out with the help of mechanized and non-mechanized/traditional crafts and in Mhadei River, fishing is carried out mostly in the creeks either by cast nets, river gill nets and barrier nets, etc. It is stated that additionally, fishing is also practiced with the help of stake nets, which form an important inland fishing activity and that such fishing activity in Goa is carried out throughout the year except the time of high tides during the monsoon season.

(lxx) The State of Goa submits that, the near shore areas of the coast of Goa are highly influenced by the Mhadei River

system, as the same eventually drains into the Arabian Sea making it nutrient rich fishing zone. It is stated that this fishing is done by traditional fishermen with the help of gill nets, hook and line, rampo normal nets, etc. It is explained that the gill nets are mainly used for catching large size fishes like sharks, seer fish, pomfrets, skipjack, etc. whereas cast net fishing is done individually with a boat and a net. It is stated that fishing by hook and line is carried out during the peak fishing season. The State of Goa submits that a total number of 1385 gears are registered in the State of Goa, out of which more than 50% are the likes, which are used in inland fishing. The State of Goa reiterates that a large part of this inland fishing activity is carried along the Mahadayi River Basin, and the same is completely dependent on the delicate balance of salt water intrusion and fresh water flow in the Mahadayi river. The State of Goa emphatically states that any change or reduction in the flow of water even to the minutest scale will result in complete destruction of the wide and unique marine flora and fauna as also the industry dependent on it.

(lxxi) The State of Goa further states that the unique aquatic eco-system, and delicate habitat created in the river system of Mhadei, is due to the delicate balance of sea water and fresh water flow alongside the terrain, which has resulted in a highly specialized eco-system for mangroves, which are basically salt water-resistant plants in inter tidal areas. It is asserted that the total area of mangroves supported by the Mhadei River is spread over about 900 hectares. It is stated that various biotic communities associated with these mangroves form a harbour to some wildlife, as well as to the various aquatic fauna. It is further stated that highly specialized eco-system forms a complex food web, and provides to the needs of not only the local inhabitants of Goa, but also to the various animals including marine fauna, as a part of the food chain. It is claimed that indeed, the luxuriant growth of mangroves around the Mhadei estuarine region plays a major role in prevention from soil erosion, thereby stabilizing and protecting the coast from heavy wave action and wind.

(lxxii) The State of Goa submits that a note of these salient features of the Mangroves was taken by the Hon’ble

Supreme Court of India in Indian Council for Environment-Legal Action versus Union of India and others (reported in [1996] 5 SCC 281), including taking a special note of the fact that Mangrove forests in State of Goa need protection as the same stretches for more than 100 meters from the River banks. It is asserted that the entire area is therefore designated as a No Development Zone and no activities are permissible in these areas, as these areas are highly eco-sensitive.

The State of Goa states that the State Government has made valiant efforts in protection of these eco-sensitive areas and all such efforts will be lost in the event there is any reduction in flow of the fresh water in the Mahadayi River. It is mentioned that the delicate balance of salt water intrusion coupled with fresh water flow is the elixir to the sustenance of these Mangrove Forests and in the event the States of Karnataka and Maharashtra are allowed to divert or reduce the flow of water in the Mahadayi river, the same will result in extinction of the wide Mangrove Forests thereby causing a large-scale havoc on the environment. The State of Goa has reiterated that the destruction of

Mangrove Forests will result in massive soil erosion along the River Banks endangering various towns and villages along the River Bank.

(lxxiii) It is submitted that a large number of flora and fauna forage for food on land as well as water and Mangroves swamps are extremely important breeding ground for the flora and fauna and as such, they exist and thrive on the unique and fragile eco-system created in the Mhadei River. It is pleaded that any disturbance to this fragile eco-system will cause wide spread devastation thereby immediate destruction of this unique eco-system. According to State of Goa besides the aquatic flora and fauna, numerous animals use these mangroves as their habitat including certain endangered species including saltwater crocodile, American crocodile, Proboscis monkey, Diamondback terrapin and the crab eating frog.

It is maintained that many fish varieties migrate from sea water to fresh water and vice-a-versa, which is technically known as Anadromous and Potamodromous, respectively for various reasons, such as food gathering,

breeding and temperature adjustment, etc., in order to complete their life cycle. Explaining in detail, it is mentioned that for example, in the Mhadei river system, sardines migrate in shoals in search of food, whereas Eels species are inhabitants of the river and migrate in large numbers after laying eggs and this unique and fragile eco-system of the Mhadei River sustains all these activities. It is pleaded that in the event, this fragile and unique eco-system is destroyed or altered, there will be a cascading effect on the migratory species which thrive therein for various purposes as mentioned hereinabove.

(lxxiv) The State of Goa submits that the Mhadei River system is also home to some rare endangered species and due to diversion of river water, rich beds of clams, bivalves and oysters may lose a rich diversity of the filter feeding species as well as the fertile beds of lobsters may also be completely destroyed as also the River-Otters, which are a rare sight now will further also be left without a home. The State of Goa pleads that it may also lose some endangered species of shark such as Rhincodon typus (whale shark), Sphyrna lewini (Scalloped hammerhead), Sphyrna zygaena

(Smooth hammerhead shark) and the coastal nesting habitats of turtles such as Lepidochelys olivacea (Olive Ridley) will also get destroyed. Furthermore, it is claimed that the freshwater pearl mussel, Margaritifera-margaritifera and Window pane oyster i.e. Placenta-placenta, which are also endangered species, may also widely be affected.

(lxxv) It is averred that on the aspects of ecology, environment, flora and fauna, fishes and fisheries, fishing industry, a large number of endangered species of birds and animals etc., and the drinking and irrigation needs of its people and other requirements which have been noticed above, the State of Goa, therefore in its conclusion on those needs, states that the Mahadayi river is a lifeline to the State of Goa, more particularly to support the vast inland fishing activity, as well as for sustenance of vast flora and fauna, including the unique aquatic eco-system. Thus, it is emphatically submitted that any diversion of the waters of Mhadei River will have massive repercussions on the inland fishing activity, as well as destroy the endangered and very fine aquatic eco-system. It is avered that the destruction of

the inland fishing will have cascading effect on the other industries connected thereto including industries related to jetties and wharfs, jetties used for berthing of fishing vessels, workshops involved in repair, maintenance and construction of small ships which are located on the banks of the river will get hampered, thereby causing large scale devastating effect in the State of Goa, including destruction of traditional activities. According to Goa, not only the damage to the mangroves will be catastrophic, but same will also be disastrous to the flora and fauna, and the ecologically important organism be destroyed, and such rich flora and fauna will forever be lost, in addition to hampering Goan people directly as well as indirectly.

(lxxvi) The State of Goa points out that Karnataka's project, with as many as 11 dams to be located within an area of 50 km., radius, has been planned in an area much prone to earthquakes and two large dams - Supa reservoir and Codasalli are just 50 and 35 km., away, respectively, from the Mahadayi project area. It is pleaded that since the project areas are bordering Goa, Goa will also be very vulnerable for any seismic disturbances.

The State of Goa apprehends that setting up of similar Projects by the State of Maharashtra, possibly emboldened by the unfortunate attempts by the State of Karnataka would be disastrous. According to Goa, the two States of Karnataka and Maharashtra, taking undue advantage of their respective geographical positions, and the vast economic resources at their command, if permitted to alter the profile of the river basin, and divert the waters outside the river basin, will pose a very serious threat to the very sustenance of the State of Goa and its people.

According to Goa, the States of Karnataka and Maharashtra are bent upon altering the profile of the Mahadayi river basin, taking advantage of their dominant, geographical and economic positions, and the two States are bent upon diverting waters from Mandovi river/river basin, outside the basin area and this will result, not merely in the complete destruction/extinction of the river/river basin, but possibly the State of Goa and its peoples.

(lxxvii) It is vehemently pleaded by Goa that the State of Karnataka, in particular, is making, and has made, several

attempts to alter the river profile, and to divert the waters from out of the Mandovi river basin to beyond and in the aforesaid regards, a reference is made to the following:-

(a) In the past the State of Karnataka had made attempts to alter the profile of Khandepar and Dudhsagar (Katla and Palna) tributaries of the Mandovi River, which originates in the State of Karnataka and joins Madei River in Goa to form Mandovi River in Goa State. An attempt was made to divert the waters outside the Mahadayi water basin into Kali Nadi basin.

(b) The State of Karnataka proposed outside the basin diversion of Mahadayi river by formulating a "Mahadayi Hydel Scheme". As per this scheme, the main storage was proposed at Kotni on Mahadayi River and series of small storages on its sub-tributaries to Katla and Palna. This involved, inter alia setting up of Kotni Dam, Irty pickup weir, Tailrace Dam, Bailnadi Dam and diversions from Murudhaul Nalla, Pansher Nalla and Andher Nalla. This scheme proposed diversion of waters from Mahadayi river to Malaprabha river basin.

(c) Outside the basin diversion of water from Kalasa and Haltar Tributaries to the sub-basin in Krishna basin. This involves interception of 4 sq.km. of Haltar Nalla in Karnataka by a Dam. Haltar Nalla after leaving Karnataka, enters into the State of Maharashtra and thereafter the State of Goa forming the Valvanti River which is the major tributary of Mahadayi river. The proposal is to divert water from Haltar Nalla to Kalasa Reservoir by an open channel to the Malaprabha sub-basin. This outside the basin diversion will affect the water supply at Sanquelim headwork and also lift irrigation schemes in Valvanti river, all within the Mahadayi river basin. Further, a dam is proposed at Kalasa Nalla and Surla stream. Surla is the tributary of Mahadayi River. About 302 Hectares of land which includes 183 hectares of forests will get submerged due to Kalasa reservoir.

(lxxviii) It is asserted that the aforesaid attempts will seriously affect the very sustenance of Mahadayi River and its basin and will also adversely affect the very sustenance of the State of Goa and its peoples. It is averred that the projections, insofar as

Kalasa reservoir put forth by the State of Karnataka, are grossly defective, unilateral and exaggerated. It is pleaded that in fact, the proposal if given effect to will result in submergence of 302 Ha of land, out of which 183 Ha., will be forest and Part of Goa – Belgaum road via Chorla Ghat will be submerged. It is stated that the road connecting Surla Village of Goa to the main road will also get submerged and all this is proposed by the State of Karnataka without even considering the disastrous effect on the State of Goa or without obtaining any consent from the State of Goa. It is pointed out that the objective is to divert waters into the Malaprabha reservoir through an open cut channel by undertaking rash engineering feats of changing alignment of the topography. The details are being deliberately withheld and the entire attempt is to create a situation fait accompli.

(lxxix) It is mentioned that to study the Karnataka proposals about diversion of water from Madei Basin to Malaprabha River, a Panel of Experts (PoE) was appointed by Govt. of Goa on 14th February 2000 and the PoE has reported that total 75% yield from the whole of Goa Region of the Mandovi/Madei Basin is 86.80 tmcft. (2460 Mcum), whereas the Water

Resources Yield from the western and the central regions will not be available for full scale developmental use, because of the present land Use and non-availability of suitable storage sites and other civic and industrial developments, which have already taken place in the region, and on account of existence of salinity zone. It is pointed out that even presuming that the full water resources from Karnataka and Maharashtra and the foothill regions of Goa becomes available to Goa state for use, the total availability of water resources for developmental purpose could be only 54 tmcft. (1531 Mcum), as against need of water in the Mandovi river basin for Goa alone would be to the tune of 92-95 tmcft. (2600-2700 Mcum), thus the Mandovi Basin is a water deficient basin, and as such there is absolutely no scope for any diversion of water outside the basin to Malaprabha river. It is informed that the same was communicated to Hon. Chief Minister, Government of Karnataka vide D.O Letter dated 21.03.2000 from Hon. Chief Minister, Government of Goa.

(lxxx) According to State of Goa during the months of May/June 2000, it came to the notice of the Goa Govt., through news

items in the newspapers, that the Govt. of Karnataka had approved the proposal of the Kalasa project on the Kalasa Nalla near Kanakumbi and the Bhandura Nalla project near Nerse on the Bhandura Nalla (both in Khanapur taluka of Belgaum district in Karnataka State) for Rs.93.27 Crores and these projects were stated to be planned to divert 3.34 tmc of water from Kalasa project and 3.2 tmc of water from the Bhandura Nalla project to Malaprabha project in Krishna basin.

(lxxxi) It is averred that the scheme envisaged construction of 86.5 mts. high storage dam across river Mahadayi downstream of confluence of Kotni Nalla, a 62 mts. High dam across Bailnadi, a 44 mts. high pickup dam across river Mahadayi downstream of confluence of Irti Nalla, a 25 mts. high-tailrace dam across Mahadayi river near State border and other ancillary works and power house. Under this scheme it has been proposed to divert about 4 tmcft (113 Mcum) of water from Madei River through a link tunnel to the Malaprabha River to meet the irrigation deficit of Malaprabha project. It is pleaded that this project report was examined in CWC and it was suggested that, Mahadayi

being an interstate river any diversion of water to the Malaprabha river basin in Karnataka, concurrence of Govt. of Goa was necessary as downstream flow in Goa may be affected by such diversion.

It is pleaded that the above letter of 03.11.2000 from the CWC also enclosed a copy of the note from the Director (HAD), Central Electricity Authority forwarded to the CWC by the CEA and the note states as under:

(1) In context with this, it is stated that DPRs of the above referred Kalsa project and Bhanduri Nalla projects have not been received by the CEA.

(2)(i) KPCL, however submitted two schemes viz. Katla and Palna diversion scheme and Mahadayi HE projects (345MW) located in Mahadayi basin to CEA for approval.

(ii) The Katla and Palna scheme was submitted by the KPCL to CEA in Nov 1985. The scheme was returned to KPCL by CEA during October 1987 since the project involved inter-state aspects with Goa.

(iii) The DPR of the project was received in August. 1991. However, due to interstate aspects with Goa, the report was returned to KPCL in March, 1992, with the request that the report could be resubmitted after the resolution of the interstate aspects.

(lxxxii) It is informed that in the meantime, eyewitness accounts and reports received from the local inhabitants of the project areas indicated that the Karnataka Govt. was making systematic efforts to start the schemes causing concern and, therefore, the Chief Minister of Goa took up the matter with Chief Minister, Govt. of Karnataka, vide D.O. letter dated 14.12.2000[26], reiterating that the Govt. of Goa strongly objects to the taking up of any projects for outside-basin-diversion of water from Madei basin. He requested the Govt. of Karnataka to stop the project construction immediately.

(lxxxiii) It is pointed out that the State Govt. of Goa also took up the matter with Govt. of India stating that Govt. of Goa strongly objects to taking up of these projects, since these projects are located in Madei basin, vide DO letter dated

14.12.2000, Goa being a lower riparian State of which a large part falls in the Madei basin, its water resources are vital for the survival and sustenance of the people of Goa, and hence, the Govt. of Goa has serious reservations and objections for these Karnataka projects involving diversion of water outside Basin of Madei River. It is mentioned that further, the Govt. of Goa requested the Ministry of Environment & Forests, Govt. of India, not to clear any project for use of water from Madei river basin by the State of Karnataka without obtaining concurrence from the State of Goa.

(lxxxiv) It is pointed out that on receipt of the intimation from the Govt. of Goa, Advisor, Water Resources, Planning Commission, Govt. of India wrote a 1etter dated.9.3.200140 to the Chief Secretary, Govt. of Karnataka, with copy to Commissioner (PR), MOWR, Govt. of India and Secretary (Water Resources), Govt. of Goa, wherein he pointed out:

> "As per the Planning Commission's letter No.16(12) 99-WR dated 30th November, 200041 (copy enclosed) before any major and/or multipurpose and medium irrigation project as

well as flood control including drainage project that has "interstate ramifications" is taken up for execution, such project/scheme is required to have the investment clearance from the Planning Commission after its techno-economic appraisal in the CWC/Technical Advisory Committee of Ministry of Water Resources. It is learnt that the matter of sharing waters of the above river remains yet to be resolved amongst the basin States."

Further, it has also been stated that "both these projects, located in the head reaches of Madei/Mandovi River in Karnataka, would divert water into Malaprabha sub-basin (a part of Krishna River basin)".

Further it was requested to send "the present status of the above two projects, particularly with regard to investment clearance/approval.

The "in principle" hasty clearance accorded by the CWC/MOWR on 30.04.2002 [42] is therefore glaringly in contrast to the principled stand they had themselves taken earlier in 2001."

(lxxxv) According to State of Goa, in response to a D.O. letter written to the Prime Minister of India by the Chief Minister of Goa, dated 19.2.20014 and another letter to Union Minister for Water Resources, by the Chief Minister of Goa,

the Central Water Commission (CWC) convened the first Interstate Meeting on 18.4.2001 under the Chairmanship of Member (WP&P), CWC, to discuss the projects proposed to be taken up by the Govt. of Karnataka in the Inter-State Madei/Mondovi river basin and the Secretaries (W.R./Irrigation) of Govt. of Goa, Govt. of Karnataka and Govt. of Maharashtra were invited for the meeting.

(lxxxvi) It is informed that the first Inter-State Meeting was fixed for 18.4.2001 but was postponed at the instance of Karnataka and the Goa team, which had already reached Delhi to attend the meeting, expressed their concern and protest and the Govt. of Goa earnestly requested the Govt. of India to prevail upon the Govt. of Karnataka not to unilaterally proceed ahead with the projects and hold an interstate meeting immediately.

It is stated that the Secretary, Ministry of Environment and Forests, Govt. of India was also informed that as per the ground realities gathered at Bhandura Nalla project site at Nerse and Kalsa – Haltar Project, Kankumbi, it was apprehended by Goa that the Govt. of Karnataka was

making massive preparations for starting the projects, without obtaining the necessary statutory clearances from MoE&F and was proceeding ahead with the work. It is averred that, therefore, the MoE&F was requested to take necessary steps to restrain Govt. of Karnataka from going ahead with these projects without obtaining the concurrence from Govt. of Goa and Statutory clearances as required from the environment and forest angle so that the interest of the State of Goa was protected.

(lxxxvii) It is informed that the first Inter-State meeting was held on 29.5.2001, and the minutes of the aforesaid first Inter-State meeting were received from CWC, vide letter dated 1.6.2001. As the said minutes were not correctly representing the full details of the discussions, the Govt. of Goa sent a letter, dated 21.6.2001, giving correct details of Discussions, and further a letter was sent by Govt. of Goa to the Director, Hydrology (South) Directorate, CWC vide letter dated 9.7.200152 to expedite and call for a meeting of the Study Group constituted in the first meeting to proceed ahead with correct yield studies of the Mandovi river basin.

(lxxxviii) It is mentioned that during the interstate meeting on 29.05.2001 the Chairman requested Govt. of Karnataka not to take up the work pending completion of studies/clearance from Central agencies and it was decided that a Hydrological Study Group under the Chairmanship of Chief Engineer (Hydrological Studies), CWC, New Delhi, with representatives of NWDA, and the three co-basin State Govts. will carry out hydrological studies for assessment of yield of Madei/Mandovi River. The Hydrological Study Group was to submit its report within 3 months.

It is pleaded that the first meeting of the Study Group under the chairmanship of Chief Engineer (Hydrology), CWC, New Delhi was held on 13.10.2001 at the Office of the Chief Engineer, WRD, Government of Goa, Panaji, Goa and in terms of the decision at the first Inter-State meeting of 29.05.2001, it was agreed that the Interstate Study Group had to submit a Report. The Chief Engineer (Hydrology), CWC, who was the Chairman of the Study Group did not even convene any meeting of the Interstate Study Group, much less call for any Report. Rather, at this meeting, the Chief Engineer, CWC, produced a Yield Study Report,

unilaterally prepared by its Hydrology Directorate, ignoring entirely the previous decision of involving Interstate Study Group.

What is informed is that the minutes of the first meeting of the Studies Group held on 13.10.2001 were circulated, vide letter dated 22.10.2001. In this meeting the CWC presented yield studies carried out by CWC with only the assistance of NWDA and Director (Hydrology) (South), CWC, New Delhi and after the presentation, detailed deliberations were held on the various aspects of the CWC study. It is mentioned that in this meeting the representative of Govt. of Goa circulated their reservations and comments on the CWC study, detailing the errors and inadequacies of the CWC study.

It is pleaded that after the receipt of the minutes of the first meeting of the Study Group, the Govt. of Goa had sent detailed comments on the aforesaid unilateral study carried out by CWC.

It is pointed out that the Study Group for the yield of Madei river basin, held its second meeting on 11.01.2002 at Bangalore. Some clarifications had been received from the NWDA, vide their letter dated 4.1.2002[61] and the Govt. of Goa requested NWDA to supply the full and correct data, as requested earlier vide its letter dated 13.11.2001, and also letter dated 18.1.2002 and the notes were circulated by Goa in the said second meeting of the Study Group at Bangalore.

(lxxxix) It is pointed out that the minutes of the 2nd meeting of the study Group were circulated by CWC vide letter dated 22.01.2002.

Extracts of these minutes have been transcribed as:

> "Chief Engineer, HSO while welcoming the members and associated officers mentioned that now each member of the study group is fully aware of the issues of concern of all the co-basin states. After the first meeting at Goa the views of all members are clear and this must help in finalizing the study early. It is mentioned that the agenda items, which were circulated in advance, were taken up for discussion."

According to State of Goa, the following paragraphs gives the outcome of the discussions:

(a) Director, Hydrology (S) requested the members to identify the rain gauge stations, which the co-basin states propose to be considered in the study. During the discussions in the first meeting, Government of Goa was of the view to consider only IMD stations. Govt. of Goa now confirmed their view that all the stations for which data is available irrespective of the agency who is maintaining the station is to be used in the analysis. Other members also agreed for the same. While raising the issue of influencing area of each stations Director, Hydrology (S) wanted to know if certain station below some threshold influencing area could be neglected.

(b) While discussing about the authentication of hydro meteorological data to be used in the study, Chief Engineer, Govt. of Goa, expressed the following concerns.

The rainfall data for some years and some stations, which they have got directly from IMD, do not match with what has been used in the preliminary study by CWC.

The discharge data at Ganjem is not consistent. The discharge varies significantly for the same gauge level.

(c) After discussing the approach to the Study, it was decided that rainfall – runoff model at Ganjem can be developed once the rainfall data and discharge data are reconciled, and corrected considering all the stations up to Ganjem.

(d) While discussing about the period for which the rainfall data is to be used for extending the rainfall-runoff model, CWC in its preliminary studies has proposed to consider the period from 1931 onwards as most of the rainfall stations were operative in this period, which give a more rational catchment rainfall value. Seventy years is sufficiently good length of series to finalize the yield studies. Government of

Karnataka agreed to this proposition. However, Government of Goa insisted to consider the data for the entire period i.e., 1901 onwards irrespective of the number of stations and their period.

After detailed discussion, no consensus among the participating States could be reached on the period of data to be used for developing the series. It was therefore decided that this would be discussed in the next meeting.

(xc) Chief Engineer, WR, Govt. of Goa, wrote a letter dated 7.02.2002, to Director, Hydrology (South), CWC, New-Delhi, by pointing out various discrepancies. A letter was also sent to Chief Engineer (HQ), NWDA, New Delhi, on the same date, pointing out those discrepancies.

(xci) Before the Study Group could even complete the yield study the CWC summoned the 2nd Interstate meeting for 27.03.2002.

The minutes of the second inter-state Meeting, as pleaded by Goa, are reproduced below:

"Item No.1: To discuss the details and status of projects proposed by Govt. of Karnataka on Madei/Mandovi River particularly two projects (i) Kalsa project near Kankumbi (ii) Bandura Nalla near Nerse.

Chief Engineer (IMO) CWC recalled that in the first inter-state meeting held on 29.5.2001 the representative from Govt. of Karnataka had stated that the present proposals being contemplated by the Government of Karnataka were truncated versions of those planned earlier and also the power component has now been dropped. He, however, mentioned that there was correspondence between the Department of Energy, Govt. of Karnataka and Central Electricity Authority, regarding clearance of Mahadayi Hydro-electric Project and desired to know the current status of the various project proposals. The representative from Govt. of Karnataka informed that the Kalsa and Bhandura Nalla projects as planned now do not envisage any power component. The Mahadayi Hydroelectric project for which DPR has already been prepared apart from power generation also involves diversion of water to the Malaprabha basin. He further clarified that the total diversion of water to Malaprabha sub-basin from Mandovi basin is about 9 tmc.

The representative from Govt. of Goa stated that they are not aware of the project proposals, now being contemplated by the Govt.

of Karnataka in Mandovi basin, and requested that the details of these proposals may be supplied to Govt. of Goa.

After discussions it was decided that Govt. of Karnataka may furnish the details of various projects proposed to be taken up in the Mandovi basin clearly bringing out power benefits as well as proposed outside basin diversion etc. under each project.

Item No.2: Hydrological studies for assessment of yield of the Madei/Mandovi River.

Chief Engineer (HSO), CWC briefly narrated the present status of yield studies carried out for Mahadayi basin and informed that in spite of convening two meetings of the study group on 13/10/2001 and 11/1/2002, the yield studies could not be finalized. He particularly stated that Govt. of Goa is insisting on analysis of rainfall data including the period 1901-1931. Also, they have reservations about the accuracy of discharge data at CWC G & D site at Ganjem. Goa had also expressed the view that all the studies had to be carried out in the presence of their representatives.

Secretary, Govt. of Goa explaining the view point of Goa stated that the rainfall data for the years 1901 to 1931 have to be included because the above period consists of large consecutive number of distress years. He also stated that

Govt. of Goa should be informed about the period of data, the method of analysis etc. well in advance so that they can convey their views. Director (Hydrology), CWC explained that out of the three stations considered during the year 1901-1931, only one station i.e. Panaji comes within the Mandovi basin and therefore considering all the three stations for purpose of runoff of Mandovi basin may not reflect the correct picture. Chief Engineer, Govt. of Goa stated that CWC discharge data at Ganjem is not correct. Chief Engineer (IMO) CWC refuting this stated that it is wrong on part of the representative of Govt. of Goa to make such a statement and explained in detail the standard procedure adopted by CWC in collection, analysis and processing of hydro meteorological data. He further stated that in case of observational and other errors, necessary corrections are always carried out at the time of data processing.

Chairman expressed his regret that Govt. of Goa has so many reservations on the yield studies and even on the data collected and utilized by an independent expert agency viz. CWC. He indicated that if such doubts exist even in the work carried out by agencies like CWC perhaps the studies cannot progress. Chairman felt that under such circumstances, Govt. of Goa might themselves carry out these yield studies. It was therefore decided that CWC and NWDA would supply all the hydrological and hydro-meteorological data collected and analyzed by

them to Govt. of Goa for carrying out the yield studies. However, he emphasized that Govt. of Goa will have to stick to a reasonable time schedule. Secretary, Water Resources, Govt. of Goa stated that three months period is necessary for completing the yield studies.

Secretary (WR), Government of Karnataka highlighted the drinking water problems in Hubli-Dharwar towns where water supply situation had become precarious due to falling grounds water levels and supply had become possible only once in 10 days or so. He requested that clearance be given for diversion of 7.5 tmc from Madei to Malaprabha reservoir through Kalsa and Bhandura Nalla diversion schemes for supplying drinking water to the twin towns.

Secretary (WR), Government of Goa stated that requirements of the Madei Basin should be first met before considering outside basin diversion. He referred to the Krishna Water Tribunal Award in this context, where certain restrictions had been placed by the Tribunal on Maharashtra for diversion of Krishna Waters outside the basin. He was of the view that Karnataka should examine other options like diversions from Kali River to meet the shortage in Malaprabha. Since drinking water was the first charge, Government of Karnataka should curtail irrigation supplies at Malaprabha.

In response, Advisor, Government of Karnataka stated that they had examined all options and the only technically and economically feasible solution was diversion by gravity from Madei.

Secretary (I), Government of Maharashtra referred to the KWDT Award as per which Government of Maharashtra has a right to stake a claim on any augmentation of Krishna Waters, by any of the party States. He also expressed apprehension that Government of Karnataka might develop the capacity for higher diversion from Bhandura nala and Kalsa once a storage scheme comes up. Government of Maharashtra also reserved the right for diverting its share of Madei waters. Secretary, Government of Goa also expressed similar apprehensions about the Government of Karnataka developing a capacity for higher quantum of diversions. Commissioner (Projects) stated that placing restrictions on quantum of diversion was one thing but totally prohibiting any diversion was another. Both Krishna and Narmada tribunals had placed no fetters on Andhra and MP/Gujarat/Maharashtra respectively on using their shares in any manner they liked including use in other basins. The grave situation in Hubli-Dharwad merited immediate attention. The diversion of 7.5 tmc proposed by government of Karnataka could easily be adjusted in the share of the State whenever decided. As regards apprehension of Government of Maharashtra and Government of Goa about

government of Karnataka developing capability for a higher diversion, he stated that the CWC could always check the technical parameters of the proposed diversion to remove such an apprehension. The three states could also consider setting up of River Basin Organisation for Madei, which could inspect works of any of the States and also serve as a vehicle for free exchange of data among the States. According to him, drinking water issues should not be delayed or deferred till the water sharing is decided.

On the request of Chairman, Secretary (WR), Government of Goa promised to take up the request of Government of Karnataka with his State Government at appropriate level.

Chairman requested Govt. of Goa to finalize the yield studies for Mandovi basin at the earliest so that the development in the basin is not hampered and water does not flow waste to the sea and impressed upon the basin states to frequently meet and exchange requisite information regarding the demands of the states so that water resources of the region could be used optimally by the basin states."

(xcii) It is stated that the Secretary, Water Resources, Government of Goa, sent Goa Government's comments on the Minutes of the Second Inter-State Meeting, to the Chairman, CWC. Vide letter- dated 16.05.2002, and it was

also brought to the notice of the Chairman, CWC, that even before the minutes sent by him could be examined and accepted by Govt. of Goa, CWC (ISM Directorate), and MoWR, vide their letter dated 30.04.2002, had unilaterally gone ahead and given the so-called 'in-principle' inter-state clearance of water availability to Karnataka to divert 7.56 tmc of Mandovi waters through Kalsa and Bhandura Nalla projects to Malaprabha sub-basin, without bothering about the resolution of any of the existing Inter-State disputes in the matter. It is averred that this one sided and unwarranted unilateral action of CWC and MoWR, in contrast to their stand so far, had turned the whole Inter-State meeting into a futile exercise and a farce and it was also brought to the notice of the Chairman of CWC that the government of Goa had lost all trust in a fair and equitable resolution of the Inter-State issue with the help and guidance of CWC and MoWR. It is stated that it was further pointed out that in view of the inexplicable one-sided favour and partiality shown to Karnataka's interests, the in-principle clearance given in an un-holy haste on 30.4.2002 by the CWC/MOWR, even before assessing correctly the quantity of water available in the Madei basin compared to

basin needs would make the diversion by Karnataka a 'fait accompli' and shut the door permanently on any possibility of a negotiated settlement and force Goa to seek judicial intervention as available under the Constitution.

(xciii) According to State of Goa, the Chief Minister of Goa, vide his letter D.O.No.1-2-2002/CM/2461 dated 7/5/2002 to the Union Minister for Water Resources and Minister for Environment and Forests, requested them to take immediate steps to withdraw the "in principle" permission or to keep it in suspension till a concluded agreement between the basin states is reached, or in the alternative the matter be referred to a Tribunal constituted under the ISWD Act, 1956, and that the outside basin diversion proposed by Karnataka affects the availability of water for specific projects in the downstream projects in Goa state, and that one of the projects (Kalsa) would also involve submergence of lands in the Goa State.

It is avered that the Chief Minister of Goa, with a view to reinforce the efforts already made, sent another letter dated 02/07/2002 to the Prime Minister soliciting his

intervention to direct the MoWR to withdraw the illegal clearance granted to Karnataka.

(xciv) It is pleaded that repeated efforts were made by Goa, and it persistently demanded through its various communications addressed to the Secretary, MoWR of the Union of India, requesting to withdraw the unjustified and illegal so-called 'in–principle' clearance accorded to Karnataka's project, and to restrain it from proceeding with construction of the project.

(xcv) According to State of Goa, Secretary (WR) Goa gave notice dated 09.07.2002 to Secretary, Union Ministry of Water Resources, New Delhi requesting appointment of a River Water Dispute Judicial Tribunal under Section-3 of the Interstate Water Disputes Act, 1956 (as amended), setting out there in the entire sequence of events leading up to the illegal sanction and strongly urging the Union of India to constitute a Tribunal under Section 3 of the ISWD Act of 1956, and pending the constitution of the Tribunal, the "in principle" clearance for diversion of water of 7.56 tmc

outside the basin be withdrawn. The matters referred for adjudication and decision in the notice were as under:

(I) To adjudicate and decide correctly the available utilizable water resources of the Mandovi Basin at 75% dependability at various points in the basin and at Karnataka's disputed project sites.

(II) To adjudicate and decide the equitable shares of the three co-basin States in the above quantity of water taking into consideration the long term in basin needs of the three States for the beneficial use of water (water supply, irrigation, hydro power generation, navigation, pisciculture and environmental protection etc.).

(III) To adjudicate and decide whether in basin needs to be given priority over any contemplated extra basin diversions and whether there is any surplus left for extra basin diversions after adequately providing for long term in basin needs.

(IV) To adjudicate and decide whether Karnataka cannot meet Hubli/Dharwad water supply requirements from locally available water resources.

(V) To Adjudicate and decide whether there are no other alternative sources available to Karnataka, such as the Kali, the Bedti, the Ghataprabha etc. from which water supply needs of Hubli/Dharwad towns could be met as a higher priority than irrigation and hydropower needs in those Basins.

(VI) To adjudicate and decide specific restrains or restrictions to be placed on the upstream States with regard to construction and regulation of their projects, during each water year for beneficially using their allocated equitable share of the Mandovi river basin waters.

(VII) To adjudicate and decide the machinery to implement the decision of the Tribunal.

(xcvi) It is mentioned that the Chief Minister of Goa vide a communication dated 09.07.2002, addressed to the Chief Minister of Karnataka reiterated Goa's opposition to Karnataka's projects for outside-the-basin diversions from the Mandovi basin and a similar letter was sent to the Chief Minister of Maharashtra apprising him of Goa's opposition to the diversion proposed by Karnataka.

(xcvii) It is informed that as a result of these various efforts mounted at different levels, Senior Joint Commissioner (BM), MoWR, vide a communication dated 19.09.2002, ultimately, placed the "in-principle" clearance accorded to Karnataka in abeyance.

(xcviii) It is mentioned that an Inter-State Meeting on Mahadayi Water Dispute was convened by Minister for Water Resources, Government of India, on 20.12.2002 at New Delhi, and the meeting was attended by the Chief Minister of Goa, Ministers for WR, Goa & Karnataka, respectively, along with senior officials of the Union Govt. and the concerned States. It is pointed out that during the meeting, Goa brought out that there were considerable variations in

the yield assessments carried out by different agencies like NWDA, CWC etc. of the Madei, and this was due to various factors such as different methodology, different rainfall figures, & observation errors etc. It is stated that fragile ecology of the river in Goa was elaborated and it was stressed that due attention needed to be given to the ecological considerations, while deciding on the shares of the basin states.

(xcix) According to State of Goa, Secretary MoWR reiterated Goa's stand on the interstate disputes relating to Karnataka's projects in the Mandovi river basin and requested for appointment of a judicial tribunal and the aforesaid request was repeatedly reiterated, through various communications.

It is informed that the Chief Secretary of Goa vide his letter dated 07.02.2005 to the Secretary MoWR, Govt. of India, made it clear that it was not ready for discussion in the proposed Inter-State Chief Secretaries' level meeting on 15.2.2005 on any issues regarding Karnataka's demands and projects for diversion of any quantity of Mandovi River

water outside the basin. It was also made clear that it had not withdrawn its request for appointment of a Tribunal.

(c) What is claimed is that the Chief Secretary of Goa, vide a communication dated 14.03.2005 addressed to the Secretary, MoWR, Govt. of India, informed that Goa was ready for a negotiated settlement without, however, withdrawing its request for appointment of a Tribunal made in July 2002. The readiness for negotiations was on the understanding that MoWR should not accord any sanctions or clearances to any project proposals of Karnataka, including those involving outside the basin diversion of Mandovi River Valley waters till all the outstanding River Water Disputes are finally resolved. It is stated that the Chief Secretary of Goa vide his letter dated 08.08.2005 to the MoWR, Govt. of India, stated that Goa was firmly opposed to any consideration of Karnataka's Kalsa, Haltar & Bhandura Nala projects and refused to participate in the proposed meeting on 9.8.2005 and he reiterated that Goa Government had sent its complaint requesting for appointment of Tribunal in July 2002, under the ISWD Act of 1956 and that this complaint was pending with the Union of

India for over three years for no justifiable reason. The only course left to resolve this Inter-State dispute was to refer the matter for adjudication.

(ci) Various communications are stated to have been addressed by Goa to Govt. India, Prime Minister in this regard. The mention has been made of a number of meetings at various levels.

It is pleaded that in the inter-State meeting called by the Union Minister for Water Resources on 4.4.2006, the Chief Minister of Goa stated that Goa had tried negotiated settlement in the past on the clear understanding that in the meantime, Ministry of Water Resources, Planning Commission or Central Water Commission will not give any clearance to projects of Karnataka in Mandovi basin, whether or not involving outside the basin transfer and that Mandovi basin is a deficit basin and Malaprabha basin is a surplus basin and, therefore, it would not be appropriate to transfer water from deficit basin to surplus basin. It is mentioned that he reiterated the request for constitution of the Tribunal under the ISWD Act, 1956, at the earliest. It is

claimed that in the above meeting the Union Minister suggested that the Chairman, CWC will convene a meeting of administrative and technical officers of the States of Karnataka and Goa, within 15 days, to sort out the issues in this regard, and report the outcome of the meeting to MoWR, but the Chief Minister of Goa did not agree to this and it was then decided that if the two states did not discuss and come forward with a negotiated settlement within 15 days (i.e. by 19.4.2006), the union Minister would initiate steps for appointment of a Tribunal.

It is claimed that thereafter, repeated requests appear to have been made by the Chief Minister of Goa and its various Officers, for that purpose, in the year 2006.

(cii) It is averred that after October, 2006 several Newspaper reports appeared that Karnataka intends to proceed ahead with the construction of the disputed projects from October 2006, even if the same are not cleared by concerned agencies of the Union of India. It is averred that Goa genuinely apprehended that if Karnataka's disputed projects are executed, and a part of the waters of Mandovi

River and its tributaries are diverted outside the basin, it would have disastrous consequences, thereby affecting the drinking water needs, the navigation and fishing activities, harbour, irrigation needs, domestic and industrial water supply facilities, salinity control in coastal region and irreversible environmental damages to Goa State. It is mentioned that Goa apprehended that Karnataka may even complete the disputed projects within a year and the announcements which appeared in newspapers, indicated that Karnataka would commence in October 2006 the construction of these disputed projects.

(ciii) It is asserted that the Goa State had been pressing for an immediate constitution of the Mandovi River Water Disputes Tribunal, under the ISWD Act of 1956 and to refer its complaint dated 09.07.2002 without any further delay because Goa was apprehensive that MoWR or its Agencies or other concerned Ministries of Govt. of India and Agencies or the Planning Commission, may withdraw the order of "withholding in abeyance" of the clearances granted earlier to State of Karnataka.

It is asserted that Karnataka's attempt was to make such outside diversion a "fait accompli" before a fair, adequate and through investigation was made and a just and final decision was rendered by a duly constituted Tribunal.

(civ) It is mentioned that similar to construction of diversion channels on Kalsa-Haltar nallahs, started by the Karnataka State, the State of Maharashtra has also started work of construction of an earthen dam on Virdi nallah which is sub-tributary of Valvanti nadi, the latter being a tributary of the interstate Mahadayi river and this work is being undertaken, by the Maharashtra State, without securing clearance of competent authorities and despite objections from the State of Goa, voiced in the D.O. Letter dated 10-1-2008, addressed by the Chief Secretary Goa, to his counterpart in Maharashtra, to give instructions to stop forthwith the work, until the disputes regarding allocation of waters are resolved by the Tribunal, setup by the Government of India, however, the work remains in full swing.

(cv) It is mentioned that the Chief Engineer (WR), Goa addressed a communication 28.12.2007, to his counterpart in Maharashtra, requesting Maharashtra not to go ahead with construction and regulation of projects upstream in Madei Basin, as it may affect Goa's equitable share but no communication has been received from CE, WRD, Mumbai, to the queries raised by State of Goa.

(cvi) It is pleaded that on 22.4.2008 a meeting, between Secretary (WR), Goa and Secretary (WR), Maharashtra, took place at Goa wherein the concern of State of Goa with regards to Virdi Project was the main agenda and in the said meeting it was decided to conduct a site visit by Chief Engineers of both the States during the first week of May, 2008.

What is averred is that on 08.05.08 Chief Engineers of both the States, Goa and Maharashtra, visited Virdi Dam site and the catchment area of Haltar Nallah in Maharashtra and in the discussions during the site visit Chief Engineer (WR), Maharashtra, disclosed that they were working out a flood storage dam at R.L 97.41 mts., from which about 15Mcum water could be diverted to Anjunem dam by

constructing a tunnel. It is mentioned that Maharashtra agreed to make available the details to Goa, once the project report was ready, but different alignments in consideration for the proposed flood storage dam were seen during the visit.

(cvii) According to State of Goa, Konkan Irrigation Development Corporation, Government of Maharashtra, on 25.03.2011 made available brief salient features of the proposed flood storage Dam for Govt. of Goa on Haltar Nallah and the said proposal was carefully studied by WRD Goa for its implications and feasibility of the proposal and it was felt that the proposed Dam proposal may not be feasible to be implemented as the dam axis is located in protected reserve forest, and clearance for the same may not be forthcoming from Ministry of Environment and Forests.

It is stated that in the month of May, 2012, a Section of the local press reported that State of Maharashtra was planning to increase the height of the Virdi dam which was under construction in Katika Nallah by 10mtrs with a plan to supply water from the storage thereof, to some areas

outside the Mahadayi River Basin and, therefore, the officers of WRD, Goa visited Virdi on the same day, but could not contact any project officials. It is averred that Goa addressed some communications to the concerned Maharashtra officers but failed to get any response. It is stated that the Chief Minister of Goa also sent a communication to the Chief Minister of Maharashtra to issue necessary instructions to the concerned department in this regard.

(cviii) According to Goa, State of Maharashtra has deviated from their original proposal of constructing the Virdi Minor Irrigation Project at the original location in Haltar Nallah, for which the State of Goa had initially agreed to consider to consent with some conditions and the changed proposal was not consented by State of Goa for obvious reasons of likelihood of the project affecting the post monsoon flow in River Valvanti in Goa, where State of Goa has two major water supply schemes, and many lift irrigation schemes. It is pleaded that moreover, the State of Maharashtra has till date ignored and failed to communicate the details of their latest proposal, or to deny existence of the same and State

of Goa is in total disagreement to the State of Maharashtra taking up the Virdi Project, without consent of Goa, and without proper Ecological Impact Assessment, in as much as the project is planned on a tributary of the interstate River Mahadayi, and is totally against the diversion of water outside the basin by raising the height of the dam.

(cix) The State of Goa maintains that as all its efforts on its part in containing the State of Karnataka in the matter of altering the profile of Mahadayi River/River basin, and attempting to divert the waters from out of the basin failed, it was constrained to file Original Suit No. 4/2006 before the Hon'ble Supreme Court of India, invoking Article 131 of the Constitution of India, seeking, inter alia, for a mandatory direction against the Union of India to immediately constitute a Mandovi River Water Disputes Tribunal under the Inter-state River Water Disputes Act, 1956, and direct State of Karnataka not to proceed with any planning, construction and water regulation of any projects in the Mandovi River basin, until all the interstate disputes were adjudicated and decided by the Tribunal to be constituted

by the Central Government. This Suit was instituted on 15.09.2006.

(cx) It is mentioned that in that Suit before the Supreme Court the State of Karnataka on 27/9/2006[94] filed an Interlocutory Application before the Hon'ble Supreme Court of India stating that it (The State of Karnataka) proposes to divert waters to the extent of 7.56 tmc annually and supplementary Affidavit was also filed.

(cxi) It is pleaded that the Ministry of Environment & Forests, Union of India addressed a communication dated 16.10.2006, to the Chief Minister, State of Karnataka, stating that the Project on Kalsa – Bhandura Nallah Project required environmental, as well as forest clearances, and therefore, such Project may not be taken without obtaining necessary statutory clearances. It is informed that Shri K. Vora, Senior Joint Commissioner, Ministry of Water Resources, Union of India also addressed communication to the State of Karnataka, stating that the request from the State of Goa for constituting Water Disputes Tribunal was under consideration, and that any executive action on the

part of the State of Karnataka, in relation to Mahadayi should not come in the way of settlement of the disputes which had arisen.

(cxii) It is averred that in the Suit proceedings before the Supreme Court, the State of Goa filed Rejoinder dated 10.11.2006 and additional Affidavit dated 15.11.2006, opposing the reliefs prayed for in the Interlocutory Application made by and on behalf of the State of Karnataka and the Union of India, Ministry of Water Resources also filed a Counter Affidavit dated 20.11.2006, clarifying that the Union of India has not withdrawn the abeyance letter dated 19.9.2002, nor does it have any intention to do so, till the water disputes relating to Mahadayi are either amicably settled amongst the party States, or adjudicated by the Competent Tribunal.

It is pleaded that the State of Maharashtra filed its affidavit dated 14.2.2007, stating that it does not take any contentious attitude in disputes between Goa and Karnataka in respect of relief, but, Maharashtra disputed contention of Goa that project within a State cannot be

considered or proceeded without approval of Central Government and it stated that in the event of disputes about utilization of waters between States of an Inter-State river, appropriate machinery is defined under Article 262 of Constitution, read with Section 4 of Inter-State Water Disputes Act, 1956.

(cxiii) According to the State of Goa, the Deputy Commissioner(BM), MoWR, Govt. of India, filed an affidavit dated 13.2.2008, in compliance to the directions of the Supreme Court, making the following statements:

- The Ministry of Environment & Forests, Govt. of India, takes the stand that prior approval must be obtained from it before carrying out any non –forestry activity on Forest Land. Prior approval of Supreme Court and the National Board for Wild Life is essential before taking up any activities in National Park/Sanctuary. If a project involves forest as well as non-forest land, work should not be started on the non-forest land till approval of Govt. of India, has been obtained for release of forest land.

- The stand that a State Government can take up a project in an interstate river basin with its own funds without waiting for clearance from the Planning Commission is against the spirit of the Planning Commission's Guidelines dated 30.11.2000 for according investment clearance.
- The affidavit further states that the spirit of the guidelines is that interstate water use cannot be changed without approval irrespective of whether Plan or non-Plan resources are used.

(cxiv) It is averred that on 21.04.2008, State of Karnataka filed Reply Affidavit in response to Union of India's Affidavit of 13.02.2008, and contested the views of the Union of India in respect of the Forest Conservation Act, 1980, and Para 4.4 of the Guidelines and Clarifications and also stated that the Kalsa-Bhandura projects do not fall under any of the National Parks of Sanctuaries and therefore no permission is required to be taken.

(cxv) It is mentioned that on 30.04.2008, the Hon'ble Supreme Court passed orders restraining Karnataka from utilizing, or

diverting, the waters under the Kalsa-Bhandura projects till the next date of hearing and the order further directed Union of India and Maharashtra to file their written statements and also, Goa to submit its reply statements.

It is pleaded that the State of Goa has given the details of proceedings before the Supreme Court and matter was taken up for various proceedings on different dates, but on 27.08.2008, Supreme Court while adjourning the matter till 14.10.2008 directed that the interim order dated 30.04.2008, restraining Karnataka from utilizing waters under the Kalsa Bhandura projects would continue.

(cxvi) According to State of Goa, on 09.01.2009, The Government of Goa filed Interlocutory Application, with a prayer to (a) Direct Government of Karnataka to stop the construction activities at the project site, (b) Not to proceed with any planning & construction and water regulation of any project in the Mandovi river basins until the Union of India constitutes the tribunal, (c) Direct the Union of India to immediately constitute the Mandovi River water dispute tribunal.

(cxvii) It is informed that on 10.12.2009, Union Cabinet approved the Constitution of Mahadayi Water Dispute Tribunal(MWDT) consisting of a Chairman, two members and two Assessors for adjudication, to adjudicate the River Water Dispute between the States of Goa, Karnataka & Maharashtra in respect of sharing waters of Mahadayi (Mandovi) River, and accordingly, when on 18.01.2010 the Original Suit was re-listed for arguments before Supreme Court, the Government advocate representing Union of India made a statement that Union cabinet had decided to constitute the Madei River Water Disputes Tribunal.

It is mentioned that on 22.11.2010, the Government advocate representing the Union of India placed a copy of the Notification dated 16-11-2010 issued by the Central Government, constituting a Tribunal to decide the water disputes relating to the Mahadayi River and River Valley and he also stated that a separate Notification was also being issued referring the entire disputes to the same Tribunal.

It is informed that on 20-1-2011, the Additional Solicitor General representing the Union of India placed a copy of the Reference Notification dated 11th January 2011

before the Apex Court and on this date, the Original Suit No. 4/2006 came to be disposed of.

(cxviii) The State of Goa has pleaded that both the States of Karnataka and Maharashtra, have not divulged information about their planning of projects in the Mahadayi Basin Area, although it is clear that the plans are afoot to alter the profile of Mahadayi River, and to divert its water from its basin, the precise extent and methodology were relatively unclear and, therefore, in the circumstances, it would be just, fit and proper that appropriate directions be issued by this Tribunal to the State of Karnataka and State of Maharashtra, to place on record the details with regard to the proposed Projects and thereafter liberty be granted to the State of Goa to make additional submissions in that regard.

It is further submitted that with regard to some of the Projects, the State of Karnataka has illegally proceeded with the works and the entire attempt appears to create a 'fait accompli', and an attempt is being made to justify diversions, citing alleged need of Hubli – Dharwad drinking

water requirements. It is vehemently pleaded that this action of Karnataka is totally incorrect, inasmuch as the entire attempt is to divert waters for irrigation purposes. It is asserted that the water available in the Malaprabha basin is being mismanaged and mis-utilized and in fact, the entire attempt is to put into jeopardy the very sustenance of Mahadayi River and the Mahadayi river basin, the large part of which is located in the State of Goa.

(cxix) According to the State of Goa, the Malaprabha Reservoir Project at Naviluteertha in Belgaum district of Karnataka was completed in 1974 to irrigate an area of 2,18,000 hectare in Dharwad, Belgaum and Bijapur Districts and what was envisaged during the planning of the project as the "cropping pattern" and what exists today are in complete contrast. It is mentioned that crops like paddy, sugarcane and horticulture, which are water guzzlers seem to have replaced the traditional cropping pattern and in the last thirty years several sugar mills have come up in the Malaprabha basin, apart from many others in neighbouring areas. It is stated that the traditional four-month cultivation cycle has found it difficult to resist the profit-driven

approach of growing of the 11 month water intensive crops and the farmers at the head and mid reaches of the irrigated belt are using water of the east-flowing Malaprabha by employing electric pumps.

(cxx) It is submitted by Goa that the Malaprabha Reservoir Project at Naviluteertha in Belgaum District of Karnataka was completed in the year 1973 to irrigate an area of around 2,18,000 hectors in Dharwad, Belgaum and Bijapur Districts and as per the statistics made available by the State of Karnataka, at the time of planning of the reservoir, the 75% dependable yield was computed as 44 tmc and accordingly the reservoir was constructed with a live storage capacity of 34.346 tmc, but as per the State of Karnataka, the 75% dependable yield has come down from 44 tmc to 26.649 tmc, and after its construction in 1973, the reservoir has filled only on 6 occasions. It is informed that a few years immediately after the construction of reservoir, say about 10 years, should have been sufficient for the State of Karnataka to realize that the actual yield is less than their expected yield and the State of Karnataka should have enforced demand side management and ought to

have controlled water utilization, giving highest priority to drinking water requirements of Hubli-Dharwad cities, but instead, crops such as sugarcane and paddy have been promoted and allowed to replace the traditional crops along the Malaprabha basin. It is vehemently asserted that the water distribution infrastructure in Hubli-Dharwad is old resulting in wastage of water.

(cxxi) It is pleaded that the Kalsa Bandura project is being executed by the State of Karnataka in the most illegal, brazen and unauthorized manner without required permissions, licenses etc., and also without adequate design, structure and hydrological planning. It is submitted that the observed stream flow data are not available at the Haltara and Kalsa Dam sites and the yield at the said two sites have been assessed by using Inglis Formula, which is an empirical, outdated and unrealistic formula.

(cxxii) It is stated that the State of Karnataka is going with the Kalsa Bandura Project without assessing the likely impact of the reduction in flows caused by the construction of Haltara Dam, Kalsa Dam, Inter-connecting canal connecting Haltara

Reservoir with Kalsa Reservoir and Interconnecting canal connecting Kalsa Reservoir to Malaprabha River on the River Mhadei, on its Flora, Fauna, wildlife and other environmental factors, like salinity, navigation, agriculture, industries, fisheries etc. It is pleaded that the proposed diversion of 7.56 tmc of water from Mhadei to Malaprabha basin would considerably reduce the flow of water of the River Mhadei and its Tributaries/Nalas. It is stated that the proposed site of Bandura dam is located very close to the Bhimgad Wildlife Sanctuary, and in any case, it is within the buffer zone. It is submitted that any construction activity would definitely affect the flora and fauna in that area.

(cxxiii) The State of Goa states that Bhimgad Wildlife Sanctuary in Belgaum District, Khanapur Taluka, Sharavathy-Khanapur Corridor is declared as a Wildlife Sanctuary vide an Order dated 28.11.2011 and this Wildlife Sanctuary is adjacent to Mahadayi Wildlife Sanctuary and Bhagwan Mahavir Wildlife Sanctuary. According to State of Goa, Bhimgad Wildlife Sanctuary is contiguous to the Mahavir Wildlife Sanctuary, Netravali Wildlife Sanctuary and Khotigao Wildlife Sanctuary and it is an important corridor for Tigers.

(cxxiv) It is further stated that the Eastern boundary of the Bhimgad Wildlife Sanctuary runs through the left Bank of Mahadayi River, and the boundaries of Jamgao and Abnali Villages, whereas the Southern boundary of the Bhimgad Wildlife Sanctuary runs through Mendir forest through the South-East side of Goa and the Western boundary runs through Bhagwan Mahavir and Mahadei Wildlife Sanctuaries in Goa ending at Village Chikale. It is mentioned that the Northern boundary runs along the Bail Nadi in the Northern side joining the Mahadei River as the boundary ends at Kongla-Kabals footpath.

(cxxv) The State of Goa states that the region is home to Tigers, Leopards, Gaur, Chital, Sloth Bear, critically endangered bats and scores of other species and that the Bhimgad Wild Life Sanctuary and its reserve forests are spread across 191 Square Kilometers in Khanapur Taluka, in Belgaum District of Northern Karnataka. According to the State of Goa, it is perhaps the only forested Taluka of Belgaum District which is connected to its South with Uttar Kannada, Karnataka's District with the densest of maximum forest cover. It is informed that this habitat is contiguous with the Anshi

National Park, Dandeli Wildlife Sanctuary, Bhagwan Mahavir National Wildlife Sanctuary, Mhadei Wildlife Sanctuary and Netravali Wildlife Sanctuary and the Tiger corridor of Sindhudurg District, Maharashtra, and is part of a crucial biodiversity vault of the threatened Western Ghats. It is stated that this entire region is sustained and supported by the Haltar nallah, the Kalsa Bhandura nallah and their tributaries, along with the Mahadei River and its tributaries.

(cxxvi) According to State of Goa, Dandeli Wildlife Sanctuary and Anshi NP to the South of Bhimgad Wildlife Sanctuary are Tiger reserves since 2006. The State of Goa states that that there is evidence to show that Tigers in Goa are not merely transient animals, but are a resident population and the forests around Chorla, Mann and Kankumbi comprise a contiguous Tiger Landscape corridor to Bhimgad Wildlife Sanctuary in Karnataka to its South-East and to Anshi Dandeli Tiger Reserve to its South which has around 35 Tigers.

(cxxvii) It is pleaded that in a study carried out in 2008, the Wildlife Institute of India (WII), had pointed out that the Protected

Areas (PAs) of Goa and their contiguous forests in Karnataka and Maharashtra are possibly some of the best potential tiger habitats in the Western Ghats region and they are in need of protection.

(cxxviii) What is averred is that the forests that will be affected due to diversion of waters by the Haltara Nallah diversion and the Kalasa Bhandura Nallah diversion are a confirmed King Cobra habitat, with densities comparable to other Western Ghats habitats. The State of Goa States that the water network of these forests support densities of this snake which is the world's largest venomous snake. It is mentioned that the King Cobra is also considered as one of the flagship species of rainforests in the world, and any scarcity of water will impact these fragile eco systems and their denizens.

(cxxix) The State of Goa states that it is a niche habitat to lesser-known endemic mammals of the Western Ghats of India including the brown civet and the small Indian Travancore flying squirrel and these waters of the Haltara nallah and the Surla River sustain multi canopy forests that are crucial

to the survival of these charismatic and yet hitherto lesser-known mammals of the Western Ghats.

(cxxx) According to State of Goa, researchers from the Mahadei Research Center have recently discovered the Mhadei caecilian, a new species of amphibian to the world of science in this habitat, and amphibian researchers strongly believe that many more species await discovery in these wet evergreen and mixed moist deciduous forests and efforts to conserve these areas will be a boon to science.

(cxxxi) It is informed that the cave formations and intrinsic forest cover of ecosystems forests support two of the rarest and endemic aspects of Bats in the world, namely the Wroughton's free tailed Bats (*Otomops wroughtoni*) which is classified under 'Schedule 1' under the Wildlife Protection Act and is classified as 'data deficient' with population trends unknown. It is pleaded that the other species, Theobald's Tomb Bats (*'Taphozus theobaldi')* is 'data deficient' and very little is known about its breeding biology and conservation status and researchers with the Mhadei Research Center believe that these forests are the hunting

grounds of these Bats and studies are ongoing in this regard.

(cxxxii) The State of Goa maintains that the flora of the region is highly diverse and includes riverine and plateau vegetation besides high tree canopy forests and myristica swamps and other unique flora in Mhadei and in Bhimgad forests depend on water. It is averred that being part of the Western Ghats landscape, these areas are among the 200 Top Priority Global Eco regions of the World, as identified by WWF International whereas remnants of primeval natural forests that have remained relatively undisturbed and big enough to maintain their biological diversity and composition exists in the region that will be affected by the diversion.

(cxxxiii) According to State of Goa, the Region is extremely rich in avian fauna and is supported by the presence of fruiting trees and an array of insect diversity, and various ornithologists have catalogued an estimated 220 plus species in the Bhimgad region. It is mentioned that the Great Pied Hornbill, the Imperial Pigeon and the Ceylon Frogmouth are some of them. The State of Goa states that

any attempts at abstraction of water will mean irreversible alteration and eventual destruction of habitat which will destroy crucial habitat of these Avian diversity. It is emphasized that continuous efforts along with local birdwatchers and the researchers of Mhadei Research Centre have helped in declaring a part of this region (Mhadei Wildlife Sanctuary in Goa and Bhimgad Wildlife Sanctuary) as an Important Bird Area by Birdlife International and the Indian Bird Conservation Network.

(cxxxiv) What is stressed is that the fresh water fish diversity of the Region is yet to be catalogued completely and the intrinsic crisscross network of streams, rivulets and nallahs are considered home to many endangered and endemic species of fresh water fishes of the Western Ghats of India. Being part of the Western Ghats of India, the region has been recognized by the World Conservation Monitoring Centre as one of the most important areas for fresh water biodiversity.

(cxxxv) It is pointed out that the presence of dense and healthy forests with Mhadei Wildlife Sanctuary, Netravali Wildlife

Sanctuary, Bhagwan Mahavir Wildlife Sanctuary and Cotigao Wildlife Sanctuary of Goa, the reserved forests of Sindhudurg District and the Anshi and Dandeli Tiger Reserves make this area as one of the largest contiguous areas after the Nagarahole and Bandipur areas for large cats as well as for elephant movement and breeding.

(cxxxvi) It is mentioned that the conservation of this area will also ensure protection to the catchment areas of important Rivers like the Mhadei, Malaprabha, Pandhari, Bailnadi, Tillari, etc. and will address the water security issues for the States of Goa, Karnataka and Maharashtra for the future, which areas are now already water deficit areas.

(cxxxvii) It is stated that along with the Tiger reserve, the area will also secure an established corridor for elephants and will ensure safe passage to migratory herds, from of forests of Dandeli and Anshi and help address the issue of human elephant conflicts in Goa.

(cxxxviii) With regard to the availability and need of water of the State of Karnataka, the State of Goa has submitted as under:

- even if the 75% dependable yield is 26.649 tmc, that is much more than the drinking water needs of the cities of Hubli–Dharwad, and as per the National Water Policy, the drinking water supply gets priority over all other needs;
- In the few years immediately following the completion of reservoir in 1973, the State of Karnataka would have observed that the reservoir is not filling and that the actual yield is less than the computed yield, and therefore they should have controlled the further use of water by controlling the cropping pattern; promotion of water saving techniques such a drip and sprinkler irrigation; conjunctive use of surface and ground waters; Instead crops such as sugarcane and paddy, which are water guzzlers, have been promoted and allowed to replace the traditional cropping pattern. If they had done proper planning then the alleged water shortage would have been overcome.

- Since the reservoir has been constructed with a much larger capacity, than the actual 75% dependable yield, it places the State of Karnataka in a position to use the 50% dependable yield, and therefore the figure of 26.649 tmc as the yield ceases to have significance;
- The State of Goa has reiterated that such alleged drinking water shortage can very well be met by diverting the water from rivers Kali and Bedti (which are intra State rivers), rather than resorting to inter basin diversion from River Mhadei.

The State of Goa emphatically denies the contention raised by the State of Karnataka that further augmentation of supplies from Malaprabha basin from irrigation to drinking water would not be possible, as the farmers from the Malaprabha region are threatening to 'blow up pipes'.

It is emphasized that State of Karnataka has 12 rivers whose potential has not been fully tapped. It is further submitted that the National Water Development Agency (NWDA), an organization under the Union Ministry of Water Resources has been entrusted with the task of investigating

possibilities of inter-basin water diversion and the NWDA has identified 16 possible links in peninsular India. What is asserted is that it is pertinent to note that for the Western Ghats in Goa-Karnataka region, the NWDA has not identified Mandovi – Malaprabha as a feasible link, and on the contrary the NWDA has identified Bedti–Varda as a feasible link, however, for reasons unknown, the State of Karnataka is insisting on diverting Mandovi water in to Malaprabha.

The State of Goa maintains that the stand of the State of Karnataka that Kali and Bedti rivers are water deficit basins or that the diversion from Kali and Bedti rivers is economically not feasible are incorrect and denied. According to the State of Goa, the NWDA has rather proposed diversion of water from Bedti to Varda, and this fact clearly establishes the fact that Bedti is in fact a water surplus basin.

37. As noticed in the opening paragraphs of this Award, an Order dated 03.09.2014 was passed by this Tribunal, with regard to a “Brief Note on Inconsistencies in Data/Information

related to Water Availability and Water Requirements projected by the States of Goa, Karnataka and Maharashtra through the Statements of Case/Statement of Claims and Related Documents", which had been brought to the notice of the learned counsels representing the three States and in view of the consensus about some data/information in various documents being inconsistent and/or incomplete, the Tribunal had exercised its powers conferred on it by Sections 9(1) (ba), 9(2) and 9A of the Act, and had given directions to the three party States, as well as the Central Government, with a view to secure required material, data as well as carry out surveys and investigations and to produce relevant data before it to enable the Tribunal to decide the two basic inputs essentially required during the course of decision making process of judicious allocation of share of waters among the various stake holders, which have been highlighted in the "Brief Note".

Accordingly, all the Party States carried out those directions of the Tribunal, and filed their respective further amended pleadings, within the time originally granted, or later extended, by the Tribunal.

The said amended pleadings, besides taking new pleas, also reiterated the original pleadings. At this stage it would also be relevant to notice, in extenso, the aforesaid amended pleadings of Goa.

While noticing the pleadings of Goa, in detail, as above, the Tribunal had made it clear that the pleadings of Goa were being noticed, as given in the Statement of Claim, original or amended, without offering any comments of this Tribunal, in any manner. Similarly, the Tribunal is also not offering any comments itself, while noticing the amended pleas of Goa, as below:

(i) The State of Goa has referred to the response in para 5.108 of the Reply dated 27.03.2014, submitted by the State of Karnataka that the State of Karnataka has considered five alternatives for the purpose of meeting the alleged drinking water needs of Hubli Dharwad region, and that both Kali and Bedti diversions were highly uneconomical, because the capital cost involved in the case of Mhadei – Malaprabha link was Rs.372 Crores, whereas the capital cost for Kali lift and Bedti lift were Rs. 464 Crores and Rs. 660 Crores, respectively. It was alleged therein by the State of Karnataka that the aforesaid lift schemes would also

involve huge power consumption and, therefore, in the circumstances, the State of Karnataka had sought to contend that diversion from Mhadei basin was the only alternative in order to meet the alleged water needs of the Malaprabha basin.

With reference to the above stated case of State of Karnataka, State of Goa states that the State of Karnataka does not possess any Pre-Feasibility Report (PFR), Feasibility Report (FR) or the Detailed Project Report (DPR), for diversion of water from Kali to east flowing rivers in the State of Karnataka, such as Malaprabha River.

According to the State of Goa the stand taken by the State of Karnataka is apparently false. It is submitted that without even preparing a PFR or FR (much less a DPR), for examining other alternatives for meeting the alleged water needs of Malaprabha basin, through the intra-state rivers in the State of Karnataka, such as Kali and Bedti, the State of Karnataka has wrongly stated that the Kali and Bedti diversions are not feasible, financially or otherwise. It is asserted that it is inconceivable as to how the State of Karnataka could arrive at such conclusions, without even

preparing a PFR or FR pertaining to Kali or Bedti diversion proposals.

(ii) Goa has maintained that the proposed Mahadayi River Valley scheme involves building six dams on the Mahadayi and its tributaries near Kankumbi-Chorla to divert water into the Malaprabha, while the Mahadayi hydroelectric project will have five more dams on the tributaries to produce Hydro-Electric power and the main diversion dam on the Mahadayi known as Kotni dam, is also designed to produce power, apart from diverting water into the Malaprabha above Khanapur.

(iii) It is asserted that these dams will be: one on Kalsa (above its confluence with Surla), one on Haltar Nalla, diverting its water into Kalsa reservoir near Chorla and three small dams on Potni Nalla above Kankumbi (it meets Tillari river in Maharashtra), interconnected and led into Kalsa reservoir. Kalsa reservoir, cumulatively then, is diverted to the Malaprabha through a tunnel near Kankumbi whereas the water from the main Kotni dam is to be led through a 5.5 km tunnel into the Malaprabha at Asoga near Khanapur.

It is emphasized that these six diversion dams involve 1.6 km of dam length, 6.4 km of tunnels, through forested ridges, and 3.5 km of open channels as excavations, and areas of submersion amount to 4,300 acres of prime forests and 1000 acre of dry and wet agricultural land. It is stressed that the second project-Mahadayi Hydroelectric project with twin purpose Kotni dam and dams on the tributaries of Irti, Bail and Andhari will submerge another 400 acres of pristine forests bringing the total area of submergence to 5,700 acres including the few villages. It is emphasized that the diversion dam on Kalasa (above its confluence with Surla River) will be depleting the waters of Surla River, which makes a beautiful waterfall in the Chorla Ghat and this will turn into a mere trickle like the Jog falls. It is stated that besides, the reduction in waters of Surla River, it will also alter the ecology of Sattari Taluka of Goa State, affecting its agriculture, fishery and its economy.

(iv) It is submitted that Opa water works is the first water treatment plant of Goa and its operation started during Portuguese regime in 1957, and is situated at Opa, Khandepar of Ponda taluka in North Goa District, and is

about 37 Kms from Capital city Panaji. It is pleaded that major treatment plants along with the clear water reservoirs of Opa water works are located at hillock of Curti, which is at 160 RL ("Reduced Level") and the drinking water needs of the Talukas of Ponda and Tiswadi, which include major city of Panjim and Ponda, are supplied from the Khandepar River, through a water treatment plant at Opa on the banks of Khandepar River, which is a tributary of Mandovi River. It is pleaded that as at present, demand of potable water is more than 140 MLD ("Million Liters per Day"), more than 4.50 lakhs of population have been covered under Opa water system. It is emphasized that the demand is increasing day by day with the rise in urban population, increase in industrialization, tourism etc., and it has been observed that the dry weather base flow in the Khandepar River especially during the lean months of February to May is not sufficient to meet the above said drinking water requirements.

It is stressed that the Khandepar sub-basin of the Mandovi Basin is critically dependent on the availability of water in the Mhadei River. It is, therefore, maintained that

the diversion of water outside the basin by the State of Karnataka would further aggravate the drinking water shortage at Opa water works. It is stated that the treatment process slows down in the monsoon due to high turbidity, and the depletion of raw water due to the proposed diversion of monsoon waters and impoundage of inflow throughout the year by State of Karnataka, at upstream through their various contemplated projects, will further aggravate the situation and may render loss of efficiency of pumps especially when during dry season at present, the State of Goa is compelled to curtail the water for irrigation requirements to meet the drinking water needs as the summer approaches.

It is stated that even to meet the minimum drinking water needs of areas served from Opa, the Water Resources Department has had to undertake measures to augment the River Khandepar which include besides several other measures for transfer of water by pumping from the main Mhadei River at Ganjim to Opa.

(v) Goa maintains that as at present, Opa water works consists of four water treatment plants which are having a cumulative water treatment capacity of 115 MLD, but as on today Opa water works treats almost 140 MLD (average) of raw water to cater the increasing demand of growing population in the service area, and keeping in mind the ever-rising demand of potable water, it is planned to set up additional 27 MLD water treatment plant at Opa, and construction of another 25 MLD Water Treatment Plant on Mhadei river at Ganjem to supply potable water to villages Pali, Cottombi, Surla, Velgaum of Bicholim Taluka, Vantem and Guleli of Sattari taluka Pillem and Dharbandora of Dharbandaro taluka, Usgao, Ganjem, Vagurme, Savoi-Verem, Volvoi and Kerim in Ponda taluka. It is stated that these projects are designed to cover the need of projected population of 2031 AD with per capita coverage of 135 LPCD ("Liters per Capita per Day") and for all these projects, the proposed and only available raw water source being Mhadei River, any diversion or impoundage of waters at the U/s region by Karnataka will jeopardize these projects' prospects and there is no alternative water source available for Goa to compensate the same.

(vi) It is asserted that the Kalasa-Bhandura water diversion scheme on which the work has already commenced is going to submerge about 723 Ha (Kalasa 320 Ha & Bhandura 403 Ha). Should Karnataka go ahead with the Kotni Hydroelectric & diversion project on the scale that it has been planned, the total area to be submerged will be 2145 Ha forests plus another 330 Ha of forest land for roads, dams power houses, township, field offices, etc., and the villages that will be submerged, some them completely and some partially are: Kankumbi, Parwad, Chorla, Kongla, Kirwale and Kabnail, Gavali, Pastoli, Nerse, Jamgaon, Mugwede, Chapoli, Jamgaon and Kavale.

(vii) Goa has pleaded that as at present the salt water ingress and the tidal influence is felt 36 km upstream beyond Ganjem or nearly 70% of the river's length in Goa and reduction in the fresh water flow from Karnataka would completely alter the river profile by moving the estuarine front deeper even beyond Valpoi.

(viii) It is stated that out of the total drainage area of 1,580 sq.km. 509 sq.Km. is affected by salinity, and in another

540 sq.km. local conditions do not permit any water resource conservation schemes, and that leaves only 531 sq km drainage in Goa which could be utilized. It is mentioned that the increase in the salinity level will have a detrimental effect on Goa's entire coastal ecosystem, not only jeopardizing Goa's Khazan lands, mangroves, avifauna, agriculture, fisheries and river navigation, but also its drinking water storages, and treatment plants at Sanquelim, Opa and other places, sharply reducing the drinking water availability in the river basin.

(ix) It is pleaded that the Mandovi estuary is navigable round the year up to about 35 km from the mouth upstream and is one of the two main waterways of Goa mainly used for transporting iron ore barges of capacity 1,000-1,500 tons and transported to the Marmugao Port for export. It is stated that the depth of estuary varies from 8-10 m at the mouth to less than 2 m.

(x) According to State of Goa, it has objected that the attempt of Karnataka to use the pretext of Hubli-Dharwad towns' pressing drinking water needs as the alleged justification for

outside basin diversion from the water short Mandovi river basin, is without basis, and the disputed Kalsa Bhandari Nalla projects are commenced without waiting for sanctions from the Central Government, and the resolution of the disputes from Inter-State river aspects. It is stated that Karnataka having given up for now the proposed transfer of diverting Mandovi river water into the Kalinadi basin for hydropower generation, and then to Malaprabha sub basin for increasing irrigation, is now giving a new scheme for diversion outside the basin, and has conveniently changed the project into drinking water project to meet the so called alleged needs of Hubli-Dharwad, and Karnataka has never come up with any particulars of the population of Hubli–Dharwad with full materials, and evidence and the gross genuine drinking needs for this population on national standards of per capita supply per day for urban population. It is averred that the existing sources of water supply and the extent of the real shortage if any have not been disclosed, and Karnataka has not mentioned as to how the domestic water supply needs of Hubli–Dharwad cannot be met locally from waters available in the surplus Malaprabha

Sub basin, in which these two towns are located or from Kalinadi basin just adjoining these cities.

(xi) The State of Goa maintains that according to 2001 census, the population of the twin city Hubli–Dharwad is only 7,86,195, and considering a liberal daily supply rate of 200 liters per capita per day which is higher than prescribed quantum, the aggregate annual domestic water supply needs of this town city would be only 2 tmc (57.40 Mcum) and not 7.56 tmc as alleged by it. It is emphasized that a major part of the need is already met from the existing supply, and NWDA (National Water Development Authority) has already assessed Malaprabha as a water surplus sub basin even after taking into account and allowing for the long-term development of increased irrigation and increases in population (up to 2025 AD) and domestic water supply which includes Hubli – Dharwad. It is pointed out that the plea of Karnataka as to the alleged shortages and the proposed diversion that too trans basin would affect the lower riparian state of Goa, when the river is the only natural resource for all its irrigation, drinking, environmental and ecological needs, flora and fauna for the

State of Goa and in contrast Karnataka has the benefit of several rivers. It is pointed out that the entire attempt is to somehow to proceed with its unilateral action to commence and complete the diversion project and thereby make a fait accompli situation.

It is further submitted that the persistent and repeated attempts by Karnataka to divert the Mandovi river waters to outside the basin are being made to deplete and evacuate a part of this scarce resource from its natural course, to Malaprabha sub basin only to increase the sugar cane cultivation area in Malaprabha sub basin in Karnataka.

(xii) The State of Goa has pleaded that the neighbouring State of Karnataka is having 7 river systems, having a total drainage area of 190.5 thousand Sq Km. Out of these seven river systems, the main river systems viz. Godavari, Krishna. Kaveri are forming nearly 80% of the area of Karnataka, whereas the west flowing rivers (which includes Mahadayi, one of the Inter-State rivers) are covering 24000 Sq.Km., which forms nearly 13% of the total geographical area, and the Mahadayi River which is having a total drainage area of

2032 Sq. Kms, covers 375 Sq.Km., in Karnataka, which is only 0.2% of their total geographical area of Karnataka State, which shows that unlike Goa, Karnataka is rich in Water Resources not withstanding any diversions from Mahadayi River. It is asserted that State of Goa has only two main rivers Mandovi (Mahadayi) and Zuari, which are covering nearly 70% of the total geographical area of the State of Goa.

It is pleaded that similarly, State of Maharashtra has 5 river systems out of which 4 river systems namely Godavari, Tapi, Narmada and Krishna which are east flowing rivers, which cover nearly 89% of the total geographical drainage area of the State, whereas the west flowing rivers are covering nearly 11% of the geographical drainage area out of which interstate Mahadayi river covers 77 sq.km basin area in the State of Maharashtra and is hardly 0.025% of the total state geographical area.

It is thus maintained by Goa that the water resources available of the interstate rivers draining out to State of Goa, as a lower riparian State, is very negligible, whereas

for State of Goa the said rivers are the lifeline covering nearly 70% of the total State's geographical area. The Goa pleads that any plans to divert the said waters will not be practicable, as the same will cause irreparable damages to the water security of the State of Goa.

(xiii) The State of Goa has pleaded that issues nos. 12, 13, 14, 15, 18, 19, 22, 24, 25, 26, 27, 28, 29, 30, 34 and 42, as framed by the Tribunal, pertain to true assessment of water availability and budgeting in River Basins adjoining the Mhadei River Basin, for the purpose of arriving at just and correct adjudication of the present dispute.

Goa has stated that since the Krishna Water Dispute Tribunal has already examined and adjudicated upon the water availability, protected usage and water sharing formula of the Krishna River Basin, the State of Goa has inspected the documents and pleadings pertaining to the Krishna Water Disputes Tribunal at New Delhi and Bengaluru, and accordingly, the State of Goa proposes to rely upon those pleadings/documents in support of its case;

but for the limited purpose of confronting the case put up by the State of Karnataka.

(xiv) However, the State of Goa maintains that it, in any manner, does not admit the correctness of contents of the said documents, in so far as they are inconsistent with or contrary to the case set-up by it, but reliance shall be placed on those documents/pleadings only for the limited purpose of pointing out the contradictions in the case of the State of Karnataka, as pleaded before this Tribunal, and to confront/cross examine, wherever necessary, any such evidence produced by the state of Karnataka. The State of Goa has given the details of some documents which it would produce, for the limited purpose of confronting the case of the state of Karnataka, and that too without in any manner, whatsoever, admitting the said documents. Besides that, Goa, also has reserved its right, to produce other documents and the pleadings of Karnataka from Krishna Water Disputes Tribunal.

(xv) It is submitted that the Government of Karnataka is merely using the pretext of drinking water needs to Hubli and

Dharwad as a bogey for diversion of waters from the Mahadayi basin and alteration of profile of Mahadayi River, because in reality, the purpose is to utilize the waters from the Malaprabha basin entirely and excessively for irrigation purposes, particularly for catch rich crops like sugar cane.

It is stated that further, the Government of Karnataka is mismanaging their existing water resources and thereafter lay claims of water resources upon which other States are heavily dependent.

(xvi) The state of Goa submits that the area under sugarcane cultivation, and the sugar production in the Malaprabha basin from the years 1972 – 2013 has drastically increased, and for instance, it is emphasized that the area under sugarcane cultivation in the said basin for the year 1979-80 was 224 hectares, but it has risen to 2756 hectares in the year 2012-13, which is an increase by more than 12 times.

Also, it is stated that the State of Karnataka has not stopped issuing permissions even for the setting up of new sugar factories in the said region, thereby promoting cultivation of water guzzling crops, such as sugarcane, in the

said region, despite the alleged water scarcity in the Malaprabha basin and particularly in the Hubli-Dharwad region. It is mentioned that the State of Karnataka has not taken any steps to further control the use of water for irrigation and particularly for water-guzzling crops such as paddy and sugarcane.

(xvii) The State of Goa has pleaded that the ground water levels in the Hubli Dharwad region have been supplied by the State of Karnataka, in reply to interrogatories raised by the State of Goa vide their Annexures 8(A) to 8(F), which indicates that there is an abundance of ground water resources available in the region.

State of Goa submits that in the month of May when the ground water levels hit the lowest, the ground water table in Hubli in the year 2013 was 38.55 meters, which is much better than the ground water level post monsoon in many parts of the country. State of Goa has further submitted that the ground water table during the month of May in the year 2001 was 9.92 mts. indicating an abundant supply of ground water level waiting to be exploited.

Thus, it is stated that the ground water level in the Malaprabha basin is quite good and there is lots of potential to exploit the said ground water resources available in the said region.

(xviii) According to the state of Goa, the state of Karnataka has not carried out any study relating to water distribution system for assessing the loss of water in the water distribution system of Hubli Dharwad cities, nor the State of Karnataka has assessed, if the alleged drinking water shortage can be met by reducing such losses.

(xix) On the basis of the aforesaid pleas, according to Goa, it is apparent that there is abundant supply of ground water resources for meeting the alleged water shortage of the Hubli Dharwad region, whether for drinking or irrigation, or any other purpose and there is scope for saving water by reducing the area under water guzzling crops like paddy and sugarcane; and there is also the scope for saving water by modernizing the water distribution system. Goa maintains that by not doing so, the State of Karnataka is grossly mismanaging its available water resources within the

Malaprabha basin, and it vehemently states that, there is no reason, whatsoever, for diverting the water from the Mhadei basin at the cost of causing irreparable prejudice, damage and harm to the State of Goa.

(xx) Goa maintains that, in reality, the excuse of drinking water supply to Hubli–Dharwad, to justify Kalsa–Bhandura project, was invented much later, because it matched the provisions of National Water Policy, 1987, which gives preference to projects, which aim at mitigating drinking water needs. Karnataka had considered all permutations and combinations–from a large Mahadayi multipurpose/ hydroelectric power project to a choice of smaller projects but all these centered around the main aim of diversion of Mahadayi water out of the basin under any circumstances.

(xxi) To support its contentions that 'shortage of drinking water in Hubli-Dharwad' was an afterthought, the State of Goa has relied upon the minutes of the meetings held on September 10, 1996 in Panaji between Minister for Major Irrigation of Karnataka, and his counterpart in Goa, which mentioned that – 'Karnataka State is facing a major problem of shortage of water for the Malaprabha irrigation

project which is designed for a command area of 2.15 lakh hectares, but is not able to irrigate more than 1.5 lakh hectares due to lack of water. It is asserted that it is in this context that Government of Karnataka has proposed to divert 4 tmc water from Kotani reservoir to Malaprabha dam and utilize 9 TMC of power generation besides diverting 3.8 tmc water from a second dam at Kalsa to Malaprabha' and nowhere in this proposal there was mention of water supply to Hubli – Dharwad.

(xxii) The State of Goa has detailed that the Planning Commission had constituted a Task Force to prepare the eco-development plan of Goa State in May 1981 under the Chairmanship of Dr. Swaminathan, Member, Planning Commission and this Task Force appointed a sub-group of top experts of CWC, and other water resource disciplines, to study and submit a report on Water Conservation and Utilization. It is pointed out that this expert's sub-group submitted its report in 1982, and assessed the average annual yield of the entire Mahadayi River Basin, (i.e. including water resources generated but neither conservable useable quantity from the estuarine lower

reaches) as 3580 Mcum (126 tmc) and the corresponding 75% dependable flow would be approximately about 60% of 3580 Mcum i.e. 2148 Mcum (76 tmc). Thus, according to State of Goa, the useful flow available for actual conservation, regulation and use from the Mahadayi river basin may be around 1350 to 1400 Mcum (47 to 50 tmc) only and this is the most reliable water resources estimate available so far, from an independent top expert committee of the Planning Commission.

Goa has stated that a Copy of the Report of the Task Force to prepare the economic development plan for the State of Goa under the Chairmanship of Dr. Swaminathan, constituted by the Planning Commission, in May 1981, has already been annexed as Exhibit D by the State of Goa, to its amended pleadings.

(xxiii) The State of Goa has stated that the Report of the Dr. Swaminathan Committee is of the year 1981, and has statistics and figures, as available prior to the year 1980. It has been submitted that some of the latest techniques in the field of hydrology, which had become now available,

were not available at the time when the said Dr. Swaminathan Report was prepared.

It is stated that further, as compared to present day scenario, the length/span of the data, estimated population figures at that relevant time, as well as the other physiographical, hydro-meteorological and other environmental features, were less developed at that time, and at the time of the aforesaid study, various related enactments such as the Environment (Protection) Act, 1986; Forest Conservation Act, 1980 and declaration of Mhadei as Wildlife Sanctuary had not taken place and thus, the said Dr. Swaminathan Report was also limited by the various aforesaid and other factors.

(xxiv) Goa has pleaded that in 1989, NWDA (National Water Development Agency) made another estimate of the total water resources of the Mahadayi river basin – i.e. from areas including the lower estuarine reach as 5332 Mcum (188 tmc) at average dependability and the yield at 75% dependability (the Planning Commission prescribed minimum dependability criteria for water resources

development projects) as 3164 Mcum (112tmc) and these NWDA's water resources assessments are now revealed to be based on erroneous assumptions of basic hydrological data such as rainfall, river discharge data. It is stressed that the estimate also blatantly ignored that water resources in the lower saline and estuarine reaches of the Mahadayi river basin which cannot be practically conserved and regulated for beneficial uses such as domestic and industrial water supply, irrigation and salinity control of the coastal stretch of lands.

(xxv) It is pointed out that considering the Report of the Task Force set up by the Planning Commission and the NWDA assessment of basin yield, the Government of Goa appointed a "Panel of Experts" for preparation of Master Plan for the long term needs of water potential of the Mahadayi river basin in Goa, and the Panel submitted its Report to Goa Government on 31.01.1999. It is stated that a copy of this Master Plan was supplied to Karnataka Government on 10.01.2000, and to the NWDA on 08.02.2000, and based on the studies carried out by the NWDA, this Panel assessed maximum yield available to Goa

as 827 Mcum. The State of Goa has produced extracts of their Report indicating how this figure is arrived at, as follows:

> "4.6.0. The yield estimates of the Mandovi river basin available to the POE are therefore only what is available in the earlier NWDA studies of July 1989 for the entire basin area. The break-up of yield of the three States corresponding to the estimated 75% dependable annual yield of 3164 Mm3 for the entire basin is not available. Working it out approximately on Pro rata drainage areas basis in the three States, the break-up of 75% dependable flows would be: -
>
> | | | | | |
> |---|---|---|---|---|
> | 1. | Karnataka | 375 sq.km. | 584 Mcum |
> | 2. | Maharashtra | 77 sq.km. | 120 Mcum |
> | 3. | Goa | 1580 sq.km. | 2460 Mcum |
> | | TOTAL | 2032 sq.km. | 3164 Mcum |
>
> The overall runoff rate per sq. km. of drainage area is about 1.56 Mcum/sq.km.
>
> This general yield rate adjusted suitably for the variations in the rainfall at individual projects sites have not been made use of an arriving at an approximate idea of the Water Resources available at the projects identified and recommended for use in the Mandovi river basin Master Plan. The executive summary of their

Report is submitted in Volume IV of the Master Plan for Madei River Basin.

4.7.0 It is not possible or practicable to conserve and use the entire Water Resources of any river basin. In the case of Mandovi river it is seen that about 509 sq.km. of the basin area in its final reach is in salinity and very fragile river zone. The river and some of its tributaries are also used for navigation by boats, launches and barges to transport people, materials and minerals. The limited area that can benefit by irrigation in Goa is located in the middle reaches of the basin and any attempt at Water Conservation in this reach would submerge even these limited areas available. These Water Resources conservation limitations have also to be taken into account in planning optimum long-term Water Resources management in this basin in Goa State. In this region there is also the existing inland water transport system of men and material by barges and boats. Upstream of this last reach of 509 sq.km. drainage area of the Mandovi river basin, there is about 541 sq.km. area at low altitudes above sea level. This is the only area available in Goa State that can be profitably cultivated and irrigated. Most of the village population is also concentrated in this reach. Any conservation attempt in this reach will submerge the only area available for cultivation and displace people without any alternative area for rehabilitation.

Thus, in Goa State virtually no conservation of the Mandovi river water resources of 509 + 541 = 1050 sq.km. area in the two lower reaches of the river appears practicable.

There are also the fragile ecological limitations of this estuarine river and sufficient quantity of fresh water must keep flowing in the river even after full conservations and diversion of water and development of projects for other beneficial uses so that the existing delicate balance of the fresh water and saline water in the estuary and lower portions of the basin are not jeopardized. Bearing all these aspects in mind Water Resources drained from about 1050 sq.km. in Goa State in the lowermost reaches of the basin have to be left well alone from any plan of conservation and diversion for irrigation, water supply and other beneficial consumptive uses.

In substance, out of a total drainage area of 1580 sq.km. of this basin in Goa State, as on outer limit, it may be possible or practicable to conserve and use the water resources generated from a drainage area of only about 530 sq.km. in the uppermost region of the river basin located in Goa. At the overall rate of 1.56 Mcum/sq.km. this would mean maximum availability of not more than 530 x 1.56 = 827 Mcum from drainage area of the river in Goa. For its balance long term water needs of the basin and surrounding areas, Goa State has to depend upon Water Resources

generated upstream in the 452 sq.km. basin areas located in Karnataka and Maharashtra.

In substance, out of a total drainage area of 1580 sq.km. of this basin in Goa State, as on outer limit, it may be possible or practicable to conserve and use, the water resources generated from a drainage area of only about 530 sq.km. in the uppermost region of the river basin located in Goa. At the overall rate of 1.56 Mcum/sq.km. this would mean maximum availability of not more than 530 x 1.56 = 827 Mcum from drainage area of the river in Goa. For its balance long term water needs of the basin, and surrounding areas, Goa State has to depend upon Water Resources generated upstream in the 452 sq.km. basin areas, located in Karnataka and Maharashtra."

(xxvi) Goa asserts that the contention raised by the State of Karnataka, inter alia in para 9.4 of its Claim Statement dated 2.01.2013, to the effect that the State of Goa has raised unsubstantiated and unfounded objections to the yield studies conducted by CWC, is emphatically denied.

According to the State of Goa, it repeats and reiterates all the objections hitherto raised by it in its Claim Statement and other pleadings filed before this Tribunal, and that the data used by CWC in arriving at the said yield

studies are completely unreliable, and the methodology is unreasonable. It is submitted that the CWC yield study suffers from certain glaring and patent defects.

In its pleadings Goa has raised the following objections to the CWC Report:

(xxvii) Objection 1:

The CWC in its report has excluded the rainfall data available at the Panaji Station from the years 1901-1927, although the data for the said years was readily available and though the State of Goa had emphatically made a request for including such data in the computation of yield of Mhadei Basin. The ostensible reason given by CWC in excluding the rainfall data from Panaji Station for the years 1901-1927 is that although the Panaji Station lies in Mhadei basin, it is located near the confluence of the river with the sea. It is submitted that there is no basis or reason whatsoever, which has been stated in the CWC report in support of its contention that rainfall data of stations near the confluence, points should be excluded. The fallacy and absence of reason in the said contention of CWC is manifest

from the fact that the CWC itself has included the rainfall data from the Panaji Station for the years 1928 to 2000 in computation of yield of Mhadei basin in the said yield studies. In any event of the matter, having excluded the said data for the years 1901-1927 on the said basis, the CWC could not have included data from the said Panaji Station for the subsequent years for computation of yield of Mhadei basin.

(xxviii) Objection 2:

It is submitted that the CWC yield study of March 2003 records that the discharge measurement at Ganjem site prior to the year 2001 was based on 'float observation' method. It is pertinent to note that the said CWC yield study report itself admits [page 38 of the study] that due to the use of float observation method, 'the discharge figures up to year 2000 may have large error as compared to current meter observation'.

It is stated in the said report itself that data for the period 1979-80 to 1997-98, which was continuously available and has been used, was observed by the 'float

observation' method. From the aforesaid, it is clear that the CWC report itself admits to large errors in the measurement of discharge data at Ganjem site prior to the year 2000. Having admitted to such large errors creeping into the discharge measurement by 'float observation' method, the CWC report makes a feeble attempt to justify the same by comparing the aforesaid data with data obtained by 'current meter' method for just one or two years after the year 2000. It is submitted by Goa that relying upon such data of a short period of time as one or two years to justify that there are no errors in the data by 'float observation' method, is completely incorrect and untenable. It is further submitted that the CWC had carried out the aforesaid yield study based on own data and methodology without having any consultation with the State of Goa and particularly at the stage of data augmentation and finalization of yield. This was objectionable, more particularly since there were no established protocol for such assessments or studies in place.

(xxix) Objection 3:

The CWC in their yield study of 2003 has taken the entire catchment area of the Mahadayi/ Mandovi basin for the purpose of determination of 75% and 50% dependable yield. It is submitted by the State of Goa that in a river basin for the state that is most downstream and adjoining the sea/ocean, the yield from the entire catchment area, right up to the land-sea boundary, is not usable. As the river enters its estuary phase, the lands become very flat and there are no well-defined drainage paths that bring the water from the rain falling on this land area to the river. The water from the rain falling on this area does not accumulate in the river, and drains out to sea/ocean directly across the land-sea boundary.

The final reach of the river before it meets the sea/ocean is called tidal reach, in which the flow is bi-directional. At certain times, particularly during high tides, the sea water flows in to the river and renders the water in the river saline and of no use for consumption whether by human beings or animals. For all these reasons, it is standard practice to exclude these areas from the yield

studies. The yield of the basin for the purpose of allocation is taken up to a certain point on the river some distance before the river actually debauches in to the sea/ocean. This is elaborated from following precedents and examples.

- The Krishna Water Disputes Tribunal has allocated the yield of the Krishna basin only up to Prakasam Barrage.
- The Narmada Water Disputes Tribunal has allocated the yield of the Narmada basin only up to the Sardar Sarovar dam site.
- The Cauvery Water Disputes Tribunal has allocated the yield of the Cauvery basin only up to an anicut known as the Lower Anicut.
- The Godavari Water Disputes Tribunal has allocated the yield of the Godavari basin only up to the Dowlaishwaram Anicut.

The area to be thus excluded depends mainly on the topography of the estuarine region and hydraulic characteristics of the river as it nears the land-sea boundary. In the case of Godavari, the area thus excluded is 3545 sq.km. where as in Krishna basin the area thus

excluded is 1868 sq.km. In comparison to this the estuary area to be excluded in Mandovi River is only 1050 sq.km, which in fact was not excluded by CWC.

(xxx) Objection 4:

The CWC in their yield study of 2003 has derived the regression equation as below:

R=0.8789 *P-49.6451.

The State of Goa has pleaded that it made an attempt to verify this equation, using the same data as has been used by CWC in deriving this equation, but the State of Goa was unable to get the same equation as has been derived by CWC. It is therefore maintained that the regression equation, as derived by CWC is erroneous, which can be seen in table 4.1 of the IIT Bombay Water Yield Study Report.

(xxxi) The State of Goa has pleaded that the basin area of the interstate Mandovi River in the State of Goa is 1580 sq km., but in coastal rivers, the water resources from the entire basin area can seldom be used gainfully, and as the river

approaches the land-sea boundary, the sea water intrudes into the river and renders a part of the river reach saline; the lands are flat and the rain falling on these lands does not accumulate in to the river and drains out directly in to the sea; and in these low-lying lands it is not possible to construct any water storage and abstraction structure. It is thus estimated by the State of Goa, that in the case of River Mandovi the area, thus unusable, is 1050 sq.km.

It is stated that due to the flat topography, and coastal estuarine conditions, the water conservation and regulation projects are possible only in the upper catchment, near the Karnataka-Goa border or Maharashtra-Goa border, and therefore, Goa is heavily dependent for its sustenance on the water resources generated in the basin areas of Karnataka and Maharashtra.

(xxxii) It is submitted that the State of Goa had approached the Indian Institute of Technology (Bombay) through its civil engineering department, which is considered a renowned and expert body, for undertaking hydrological study in respect of Mhadei River basin, and Indian Institute of

Technology (Bombay), in turn had deputed two of its eminent faculty, namely Prof. V. Jothiparkash and Prof. M. C. Deo, Professors in the Department of Civil Engineering g, I.I.T. (Bombay), to carry out the said work.

It is mentioned that upon examining the available rainfall, gauge and discharge data of the Mhadei basin, the said IIT (Bombay) team, comprising Prof. V. Jothiparkash and Prof. M.C. Deo, have submitted their detailed Report dated 16.12.2014.

(xxxiii) Goa, thus, states that from the analysis of the said Report, it is apparent that there are serious discrepancies in the data compiled by CWC and/or IMD, as explained herein below:

(a) The CWC was making discharge observations by a method known as the “float method” up to the year 2000. From the year 2000 onwards, the CWC changed to a method known as “current meter method”. The latter method is technically known to be more accurate than the former. Therefore, it was expected that since the analysis was being presently undertaken

taking into account 13 years of current meter data, the same would lead to more reliable yield studies.

(b) It has been however observed in the said Report that when various scientific checks were applied to this data, it was found that the data from the year 2006 onwards does not pass the said checks. The checks applied and the outcome thereof is explained in detail with the help of graphs etc. in paras 3.2.3 to 3.2.4 of the said Report. It is submitted that is for the CWC to explain the reasons for this discrepancy and explain as to whether it is possible to correct the errors reported, because otherwise the study would be reduced to use of data only up to 2005;

(c) In the said Report, it is thus observed that the discrepancy in the discharge data, after 2005, indicates a serious deficiency in the observation procedures by the CWC. It is therefore submitted that a serious doubt arises as to whether the Report of CWC contains similar procedural deficiencies in the earlier years also. Incidentally, the State of Karnataka

is seeking to place reliance on the same data, which has been used by CWC, for the purpose of carrying out the yield study (2003) of the Mhadei basin.

(xxxiv) The Central Water Commission (2003) Report, has been challenged by the State of Goa, also, on the following grounds:

(a) Besides the above, the Report also reveals that the runoff expressed as a percentage of rainfall, known as the "runoff co-efficient, also known as the "runoff factor" has worked-out to, as high as, 90%. In some years, it is more than even 100%. The hydrologic experience suggests that the runoff co-efficient is typically between 35 to 50%. In the present case however; the runoff co-efficient being 90% or even more suggests that for the years prior to 2005, there is a discrepancy in either the runoff data or the rainfall data or both.

(b) The said report has also reviewed the earlier studies conducted by NWDA, CWC and IISc. It has also been observed that the CWC Study (2003) and the IISc

Study had used the same data set. However, the both the said studies have come out with different regression equations.

(c) In the said Report, it has also been observed that in said earlier studies, the run-off over the entire catchment area had been taken as the 'yield' of the basin.

(d) It has been observed in the said Report that run-off and yield are two different concepts. A reach of the river before it finally meets the sea/ocean is affected by intrusion of saline water. The flow in the river in this reach is unfit for any productive use for human beings, animals or agriculture. Also, a strip of the catchment close to the coast drains directly into the sea / ocean and does not contribute to the river flow. Therefore, it is necessary to exclude the rainfall falling in this part of the catchment and also to exclude the flow in the saline reach from consideration of utilizable water resource. This run-off which includes only the utilizable flow / water resources is called the "yield".

(e) The said Report has assessed the catchment area to be thus excluded as 501 sq.km and has computed the yield only on the remaining catchment area.

(f) Despite the run-off and/or rainfall data observed to be unreliable, the said experts have made an attempt to analyze the yield of River Mhadei using the said available data, in compliance with the directions issued by this Tribunal vide its Order dated 03.09.2014.

(g) It is however maintained by the State of Goa that the States of Karnataka, Goa and Maharashtra, as well as CWC, have all conducted their respective hydrological studies, which have come out with mutually inconsistent conclusions regarding the yield etc.

It is further submitted that the details of the inconsistency in data is already brought out in the Report prepared by Prof. V. Jothiparkash, which is already brought on record of the case.

A copy of the hydrological data in possession of Goa has been annexed as Exhibit B to its Submissions

in compliance with paragraph 4 of the order dated 03.09.2014 passed the Tribunal.

A chart showing comparison of the physiographical features of the basin and the hydro-meteorological characteristics of the region has been annexed as Exhibit C in support of its aforesaid submissions.

(xxxv) It is asserted that both Karnataka's & Maharashtra's portion of the Mahadayi river basin areas are in the initial and head reaches of the river in the rugged area of Western Ghats, and comparatively the rainfall in these head reaches of the Mahadayi River and its tributaries are much higher than in the middle and coastal reaches of the basin in Goa State. It is mentioned that the rugged areas in head reaches of the Mahadayi basin in Karnataka and Maharashtra States have thick forests and scant area for irrigation and sparse population and, therefore, a substantial portion of the dependable and available fresh water resources of the Mahadayi River on which Goa's social, economic and environmental sustenance depends, is generated in the

drainage areas in upper reaches of the basin in Karnataka and Maharashtra.

(xxxvi) According to Goa one of the major issues for adjudication in the present dispute is the reliable quantity of water at 75% dependability flow of the basin, which is only available for beneficial use by conservation and regulation, after excluding water resources generated in the lowest estuarine, saline, tidal and coastal reaches of the Mahadayi river and its tributaries in Goa, which the State of Goa has been asserting over the years.

(xxxvii) It is emphasized that the action of commencement of constructing the interconnecting channel, by Karnataka, between Kalasa Nallah and Mahadayi River, which is already in the final stages of construction, tantamount to annexation of a part of watersheds of water deficient Mahadayi Basin to the water surplus Krishna Basin, rather than a normal diversion of the rivulet which is a totally uncommon, unilateral and unacceptable kind of diversion inasmuch as it is changing the course of the western direction flowing river to eastern direction flowing and the

process that is being adopted by State of Karnataka, in case of Kalasa diversion, would tantamount to killing of the river as well as this pristine region of India.

(xxxviii) The State of Goa points out that the Kalasa-Bandura diversion project was initially granted an 'In-Principle' clearance by CWC, evidently only on water availability angle, and the aforesaid 'in- principle clearance' was also kept in abeyance by CWC later on, however, Karnataka went ahead with construction of Kalasa diversion works stating that they were taking up the works in their area, with State funds, alone, and limited to non-forest areas where MoE&F clearance is not necessary.

Goa states that the main condition to the said 'in principle clearance' was that State of Karnataka should not raise any infrastructure and make provisions for conveying quantum of water, that was allowed in the said clearance, but the ongoing works of Karnataka totally breaches this condition inasmuch as once the interconnecting channel is completed; even Karnataka, if at all they intend to do so, cannot control the quantum of water flowing into

Malaprabha River from Mahadayi Basin. It is further stated that Karnataka had never shared any technical information regarding the construction, including the project details, even to the Central Water Commission, and not at all to the States of Goa and Maharashtra and all this is being done in complete violation of the Law.

(xxxix) Goa points out that the Mandovi River, called Mhadei in upper reaches, originates in Karnataka, and taking advantage of being situated at a higher altitude, Karnataka had persistently pursued the plan of diverting waters of Mhadei River eastwards, to Malaprabha River in Krishna basin. It is stated that firstly, it proposed to divert 5 tmc of water to another west flowing River Kali Nadi, for hydro power generation, and when this was resisted by the Goa government, the plan was changed to diversion of 9 tmc of water, from various locations, to east flowing River Malaprabha, to augment the supplies in Malaprabha basin for all uses. It is pointed out that when this was also resisted, Karnataka, somehow obtained an “in principle” permission for diversion of 7.56 tmc of water to Malaprabha reservoir, purportedly to meet drinking water

shortage in Hubli-Dharwad cities, and Karnataka has reported that the yield at Malaprabha reservoir site has been only 26 tmc, much less than the design yield. However, according to Goa, even 26 tmc is sufficient to meet not only the present, but also future water needs of Hubli-Dharwad cities, and yet have sufficient water for irrigation also.

(xl) It is submitted that the In-Principle Clearance dated 30.04.2002, issued by the Ministry of Water Resources, Government of India, to the State of Karnataka, was for diversion of 7.56 tmc of water from Mhadei basin to Malaprabha through the implementation of Kalsa and Bhanduri Nalla Scheme from 'Water availability angle' only.

It is submitted that whenever any State proposes to construct any major medium irrigation, such State has to obtain an Investment Clearance from the Planning Commission, which is granted on the basis of the recommendations of the Technical Advisory Committee (TAC) of the Ministry of Water Resources.

The said "In-Principle Clearance dated 30.04.2002" was given to Karnataka, subject to fulfilment of the conditions as stated therein. One of the conditions stipulated in the said clearance was that the Government of Karnataka will furnish all required design details to enable the CWC to satisfy itself that Karnataka does not develop technical capability for diversion of more water than that mentioned in the said clearance at later stage.

The State of Goa has asserted that to the best of its knowledge, the State of Karnataka had never submitted the said required design details to CWC, and on the contrary, had commenced work without taking any other, and further, permissions, as required by law.

(xli) According to the State of Goa, the construction work which was being carried out on the said Kalsa and Bhanduri project by the State of Karnataka, despite the said in principle clearance having been kept in abeyance; despite not having obtained the investment clearance, as stipulated in the Clause (d) of the said in principle clearance; despite not having obtained the environmental & the forest

clearance; is in complete violation of the terms and conditions of the said clearance itself, as well as the other provisions of law and that on this ground itself, the said project would be liable to be stopped.

(xlii) It is stated by Goa that the State of Karnataka and State of Maharashtra cannot, and do not have the right to, divert water from Mahadayi Basin into Malaprabha Sub-Basin and Tillari Basin, respectively and such work on the part of the State of Karnataka and State of Maharashtra is not only illegal and without authority of law, but would have serious and devastating effect on the environment, life, nature, economy and survival of the people of Goa.

It is asserted that if the proposed actions of the State of Karnataka and State of Maharashtra are allowed, whereby the water from the Mhadei River is allowed to be diverted to other Basins, the same would have devastating effect on the State of Goa.

(xliii) Goa maintains that Mhadei River originates and flows through the entire Western Ghats, and the Western Ghats

and Mhadei River are environmentally and naturally inextricably interlinked, and any interference in that nature could be disastrous. It is stated that the Western Ghats is a mega biodiversity hottest hot spot, the major portion of which is declared as a Protected Area and the entire Western Ghat has been providing contiguous corridor for safe movement of wildlife in the State of Goa.

It is mentioned that the Western Ghat acts as a catchment area for all rivers, including Mhadei and the Western Ghat comprises in it a corridor for safe movement of wildlife, such as tigers. It is averred tht the areas of Western Ghats on both sides of the Mhadei River have been declared as Mhadei Wildlife Sanctuary consisting of an area of 208.48 sq. km. which spreads across Sattari Taluka, vide Notification dated 03.06.1999.

It is averred that the entire Mhadei Wildlife Sanctuary is getting nourished from the waters of Mhadei and Mhadei Wildlife Sanctuary is also nourished by Surla River which is its tributary which leads Mhadei River to Uste. It is maintained that the flow of Mhadei River brings huge

amount of macro nutrients, which gives rise to diverse flora and fauna in the low-lying areas of Mhadei Wildlife Sanctuary and River Mhadei passes through the sanctuary and is the source of water for the sanctuary.

(xliv) It is stated that if any water from Mhadei River is diverted by the State of Karnataka, this flow of macro nutrients would stop, which would directly result into affecting the diverse flora and fauna in the low-lying area of Mhadei Wildlife Sanctuary and thus, the diversion of water from Mhadei River is going to have a direct impact on the vegetation, agriculture and ecology and consequently, the wildlife in the Sanctuary.

(xlv) The State of Goa states that Mhadei Wildlife Sanctuary has been divided into seven different types of habitat, namely Rocky cliffs, vegetation above 800 meters MSL, River bed vegetation, Riparian forest, Natural grasslands, Lateritic Plateaus and Myristica Swamps but the level of moisture plays an important role in the vegetation in the aforesaid areas. It is mentioned that pertinently, one of the tributaries of Mhadei River, i.e. Kalsa River after entering

the Goa has a deep fall called “Ladkecho Vozar” and the moisture generated from the fall is very vital for the vegetation around this area. It is stated that some vegetation and habitats which specifically rely on such moisture would be eliminated, if the water from the Kalsa River is diverted, as is sought to be done by the State of Karnataka and this is going to have multiple disastrous effect on the vegetation and consequently, the wild forest inhabitants.

(xlvi) The State of Goa states that in the said Mhadei Wildlife Sanctuary, there is bio-diversity consisting of 67 species of trees, including 35 endemic and 12 rare whereas there are 42 species of shrubs, out of which 10 are endemic and 4 rare. It is informed that further, 18 species of climbers consisting of 4 endemic and 2 rare and there are 14 species of herbs, of which 5 are endemic and 2 rare species.

It is mentioned that the entire Surla River is covered with Tropical Semi Evergreen Forests with thick growth of cane (Calamus spp), and if the water of Kalsa River is diverted by the State of Karnataka, the same would

adversely affect fresh flow of water in Surla River Valley, which would adversely affect the change in environment as well as micro-climatic condition of the area.

(xlvii) The State of Goa states that Mhadei Wildlife Sanctuary consists of different types of fauna, animals, including those contained in 'SCHEDULE 1' OF THE Wildlife Act. Tigers are again endangered species in the World and there are Sloth bears, Leopard, Mouse deer, Malabar giant squirrel and Indian Pangolin which are also endangered and vulnerable status as per IUCN categorization. It is stated that there are endangered, vulnerable and threatened species, and other fauna that are endemic and classified as Rare and there are also Mammals like Slender loris, Flying-squirrels and Giant squirrels are also reported to be raring in the Sanctuary.

The State of Goa states that it has been now well established that in the Mhadei Wildlife Sanctuary there exists Tigers as per the All India Tiger Estimation, 2014 and presence of five Tigers, have been found on the basis of results of the Census undertaken in April 2014.

(xlviii) According to Goa, if the flow of the water from Mhadei River is in any way affected or diverted, the same would directly have impact on the eco-system and prey base for tigers in the said Sanctuary which would be directly affected and jeopardized.

Goa mentions that there is unique practice of gene pool conservation in Mhadei Wildlife Sanctuary, wherein local community never kill large population of fresh water carps in the River as they are treated as sacred.

(xlix) Goa mentions that Mhadei Wildlife Sanctuary is the only habitat in the World for the “Wroughton’s Free Tailed Bat” and this species is highly endangered and rare for whom Mhadei Wildlife Sanctuary serves as the best foraging ground. It is stated that one of the reasons for establishing the Sanctuary is, because of this unique species and these species are very sensitive and slightest variation in microclimatic condition of the area would endanger these species.

The State of Goa states that Kalsa River (Surla in Goa) meanders through Mhadei Wildlife Sanctuary, and acts as a breeding ground for species of fresh water fishes and amphibians that, in turn serves the species and animals, such as Otters, Fishing Cats, Marshy Crocodiles, etc.

(l) Goa maintains that the proposed diversion of water by the State of Karnataka and State of Maharashtra would increase the salinity of water and there will be increase in the tidal base water flow due to which the residents living on the banks of Surla River, i.e. Villages of Surla, Derodem, Codal, Vainguinim within the villages of Nanoda and Uste, besides the Sanctuary, would suffer immensely on account of depletion of River water and in addition, the source of underground water would also be completely depleted.

(li) The State of Goa has stated that Mhadei Wildlife Sanctuary is an important place for nature loving people and has a potentiality of developing the area for Eco-Tourism. It is stated that there are perennial and seasonal waterfalls, such as Ladkecho Vazor, Ivrem or Choraoneum and there is lot of white water rafting, which is the only river aquatic

sport in the State of Goa which goes up in the Mhadei River. It is claimed that if there is any diversion of water from the said River, all these activities would greatly suffer.

(lii) What is stressed is that the action of Karnataka is not only in contravention of the Doctrine of Public Trust, but also in violation of Wildlife Protection Act because in terms of Section 29 of the Wildlife Protection Act, no person shall destroy any wildlife or destroy or damage the habitat of wildlife by any act or divert, stop or enhance the flow of water from the Sanctuary without the permission of the Chief Wildlife Warden, and such permission cannot be granted without the consultation of the State Government and the Board for better management of the wildlife. It is pleaded that the entire activity proposed and part of it being carried out by the State of Karnataka is therefore illegal and in breach of not only the Wildlife Protection Act but also the Environmental Protection Act.

(liii) The State of Goa maintains that the damage and some of the multiple problems, due to diversions, that would be

caused, apart from several other violations and problems, are as under:

- The microclimate of Mhadei river basin will undergo major changes that in turn will adversely affect vegetation of the area.
- Migration of Wildlife and even extinction of certain species.
- Depletion in groundwater and freshwater aquifers.
- Increased man - animal conflicts.
- Livelihood issues of the population residing along the river course including bio-diversity depending from time immemorial.

(liv) The state of Goa states that the loss in all this cannot be quantified as it is not ordinary article of commerce, but if at all the other incidental effects in-terms of money has to be quantified the same would be as under. It is pointed out that the loss that would be caused by the said diversion sought to be done by the State of Karnataka and State of Maharashtra, if permitted, would be around Rs. 14,091/- Crores. It is mentioned that the Ministry of Environment

and Forests in the year 2004 framed Guidelines for computing the environmental losses on account of four parameters of soil erosion, effect on hydrological cycle, wildlife habitat and microclimate upsetting of ecological balance. It is claimed that applying the aforesaid Guidelines and taking into account the area of the Mhadei Wildlife Sanctuary is 208.48 sq.km. The fact that 2/3rd of its area falls in Tropical evergreen, Semi evergreen and Moist deciduous forests. The same would be around 138.98 sq.km. with a canopy density of 0.8. The total loss which would be caused is as under:

Mhadei Wildlife Sanctuary : 138.98 sq.km.

(1 sq.km. : 100 Ha i.e. 13,898 Ha).

Environmental losses/Ha. : Rs.126,74 lakhs

(Over a 50-year period for a canopy density of 1.0)

Total quantum of environmental Losses : 13,898 Ha x 0.8 x Rs. 126.74 Lakhs = 14091,46,01,600

i.e. Rs. 14,091/-Crores.

(lv) According to Goa, it being a riparian State, is entitled to use all the waters that flows into its territory of all the

tributaries of Mhadei River including that coming from upstream.

Goa states that as per the Doctrine of Public trust and Precautionary Principle, by no standard of imaginations, the State of Karnataka and State of Maharashtra, can be permitted to carry on their construction, and divert the water from Mhadei River into any other basin or for that matter, to divert any water from Mhadei River. It is claimed that the same would have devastating effect on the ecology, sociology and the economy of the people and the State of Goa.

(lvi) It is pointed out that the Goa State Pollution Control Board, (hereinafter referred to as the 'GSPCB'), under the mandate of the National Water Quality Monitoring Programme, monitors water quality at eight locations along the Mhadei river and its tributaries in the State of Goa and the purpose of this monitoring as mandated by the Central Pollution Control Board is to monitor various physical and chemical parameters like the pH, Conductivity, DO, BOD, Coliform count, etc., which are analyzed on monthly basis. It is

mentioned that selective metal contents are analyzed twice a year.

(lvii) It is emphasized that the monitoring is carried out at the following locations as per the Central Pollution Control Board guidelines along with their classification:

a)	River/tributary Khandepar at Codli	Fresh water	Class C
b)	River/tributary Khandepar at Opa	Fresh water	Class C
c)	River/tributary Mhadei a Dabos	Fresh water	Class C
d)	River Mhadei at Tonca, Marcela	Saline/brackish water	Class-SW-II
e)	River Mhadei at Panaji (near Mhadei Bridge)	Saline/brackish water River	Class-SW-II
f)	Mhadei at IFFI Jetty, Campal	Saline/brackish water	Class-SW-II
g)	River Mhadei at Hotel Marriott, Campal	Saline/brackish water	Class-SW-II
h)	River Mhadei at Amona	Saline/brackish water	Class-SW-II

(lviii) It is stated that the GSPCB has been collecting these water quality analysis data for the last 10 years, i.e. from 2004 to 2014, and at present all the parameters are within the Central Pollution Control Board prescribed limits, and do not show any definite trend either seasonally or annually, except turbidity and faecal coliform.

(lix) The State of Goa states that the Central Pollution Control Board, New Delhi has classified the stretches of river Mhadei into various categories, which are as under:

(a) Class – C (fresh water) – from starting point where it is called Mahadayi and then Madri up to its confluence with Ragada and northern boundary of Nirancal;

(b) Class – SW-II (saline/brackish water) – from point of confluence with river Ragada up to Arabian Sea;

(c) Ragada tributary to Mhadei River – Class – C (fresh water) – from starting point of its confluence with Mhadei river;

(d) Khandepar tributary to Mhadei River

1. Class – C (fresh water) – from staring point including Dudhsagar river to Kali Nadi up to Opa Weir;
2. Class – SW-II (saline/brackish water) – From downstream of Opa Weir to its confluence with Mhadei river;

(e) Class – SW-II (saline/brackish water) – Cumbharjua Canal connecting River Zuari and Mahadei.

(lx) What is asserted is that, it is pertinent to note that the proposed construction of storage and/or abstraction of water by the State of Karnataka, and by the State of Maharashtra, on the upstream stretches of river Mhadei will reduce the quantum of water flowing in river Mhadei and its tributaries, and this will increase the concentration of pollutants increasing the stress on water treatment plants at Opa and other water treatment plants.

It is further stated that non-availability or reduced availability in the perennial water source due to abstraction

in upper catchment area will also have negative impact on effective groundwater recharging thereby affecting the ground water availability. The ground water also provides water for irrigation.

(lxi) Goa states that the Central Pollution Control Board has devised a scheme for classification based on existing traditional organized use being adopted for which the first step is to identify the uses. The following uses are identified for fresh waters:

Fresh Waters

A. Drinking water sources without conventional treatment but after disinfection; Outdoor bathing (organized);
B. Drinking water source with conventional treatment followed by disinfection;
C. Properties of wild life;
D. Fisheries;
E. Recreation and Aesthetics
F. Irrigation
G. Industrial Processing

H. Industrial Cooling

I. Navigation

J. Controlled Waste Disposal.

K. Fresh Waters including estuaries and coastal waters

L. Salt pans

M. Shell fishing

N. Contact water sport

O. Commercial fishing

P. Recreation (non-contact)

Q. Chemical Recovery

R. Industrial cooling

S. Harbour

T. Navigation

U. Controlled waste disposal.

Fresh Waters including estuaries and costal water

i. Salt pans

ii. Shell fishing

iii. Contact water sport

iv. Commercial fishing

v. Recreation (non-contact)

vi. Chemical Recovery

vii. Harbour

viii. Navigation

ix. Controlled waste disposal

(lxii) The State of Goa states and submits that the scheme of classification to deal with such multiple use situations, is evolved based on that use, which demands the highest degree of water quality and the use thus identified is referred to as the designated best use Industrial cooling and it can be emphatically stated that any change or reduction in the flow of fresh water in river Mhadei will not only cause irreparable and irreversible damage to the environment, but the same will also prevent the flushing out of the pollutants, which are caused due to the various factors in river system. It is further stated that in such an event, the waters of River Mhadei and its tributaries will become unusable and beyond any possibility of treatment for sustained use, and this will be disastrous for the entire system dependent on the river basin.

(lxiii) It is stated that trans-basin diversion of the Mandovi River and its tributaries by Karnataka would result not only in loss of valuable, limited water resources and its beneficial uses downstream in Goa State, but also a total loss of cheap and environmentally clean hydro power potential available within the State. It is stated that the water requirement for hydropower generation within the basin in Goa could thereafter be beneficially used for domestic, industrial, tourism, water supply needs and for irrigation and to sustain existing navigation and preservation of Goa harbor, but the proposed outside the basin diversion of Mahadayi river waters by Karnataka would deprive Goa of all the above benefits and would be clearly detrimental to the in basin beneficial uses of Goa State and its inhabitants.

(lxiv) It is emphasized that the state of Goa is virtually entirely dependent upon waters from Mahadayi/Mandovi River whereas Karnataka has within its state the benefit of several interstate rivers apart from intra-state rivers. It is pleaded that Malaprabha is a tributary of the Krishna River and the requirement of sub basin of Malaprabha could be adequately met by the water allocation made in favour of

the Karnataka in the award rendered by Krishna Water Disputes Tribunal. It is stated that even assuming, without admitting, that the small so called alleged need of Hubli/Dharwad water supply is not a pretext for trans-basin diversion, the alleged water supply requirement can easily be met by a marginal reduction in irrigation uses from adequate water resources available in Malaprabha sub-basin and it can also be met from other west flowing rivers flowing exclusively in Karnataka such as the Kali, the Bedti, etc.

It is pointed out that the Kali basin adjoins and is closer to Hubli/Dharwad towns and on the contrary Goa has no other alternative resources to meet its requirement for drinking water in addition to its other needs viz. ecological, environmental and irrigation needs. It is stated that as per the water balance study report (1989) prepared by National Water Development Agency (a society of Ministry of Water Resources) the Malaprabha basin is a water surplus basin and thus, there is no justification for the proposed transfer by Karnataka.

(lxv) It is submitted that in the present case, the question involved is not merely that for an “Inter-State basin transfer within the States of Karnataka and Maharashtra, but the question involved is whether such trans-basin diversion which is bound to very seriously affect the rights of lower riparian States, like the State of Goa should be permitted. It is stated that in fact, the proposal of trans-basin diversion, if proceeded with by the States of Karnataka and Maharashtra is bound to destroy the Mahadayi basin, the Mahadayi River and the people of State of Goa, who depend almost entirely upon such River basin of such River for their very sustenance and wellbeing. It is averred that the trade, occupation which have been carried on for centuries stand risk of being wiped out and the navigation and transportation through Mahadayi River, which is virtually the lifelines of the economy stand at serious peril. It is pleaded that highly eco-sensitive regions, including the Khazans, Puran Xeti, etc. shall be rendered extremely vulnerable.

What is maintained is that any tampering with the Mahadayi River basin or Mahadayi River in the manner

proposed by the States of Karnataka and Maharashtra or even otherwise, is bound to increase the salinity caution, thereby rendering practically the whole Mahadayi River in the State of Goa unfit for drinking water purposes and the increase in the salinity is bound to have several other disastrous effects upon the marine and human life as well. Several eco-sensitive spots are bound to be destroyed.

It is emphasized that the sea water intrusion will seriously affect and even destroy the forests and portions of Western Ghats not merely forming a part of the State of Goa, but also the States of Karnataka and Maharashtra and several heritage structures and traditional occupants, farming practices will run serious risk of destruction. In these circumstances, it is submitted that trans-basin or inter-basin diversion of waters from the Mahadayi basins or the Mahadayi River is not liable to be permitted.

38. However, at this stage, it may not be necessary to notice any further detailed pleas taken by the States of Karnataka and Goa, on account the interim order dated 27.07.2016 passed by this Tribunal, whereby an interim application, being I.A. No. 60

of 2015, filed by the State of Karnataka was rejected. In the aforesaid Interim application, very detailed facts had been given by the State of Karnataka, seeking permission to divert 7.56 tmc of water, outside the Mahadayi Basin, through Kalasa-Bhandura Channel to Malaprabha Sub-basin, and very detailed pleas had been taken by the State of Goa, raising a grievance against the construction of the aforesaid diversion channel and other connected works, by the state of Karnataka, for the said Kalsa Bandura Project, for taking water outside the Mahadayi Basin.

At this stage, it would be pertinent to notice certain minimal facts pertaining to I.A. 60 of 2015:

(i) By filing the said application, IA 60 of 2015, the State of Karnataka had prayed before this Tribunal, to permit it, at its own cost, to lift or pump 7 tmc of water annually from Mahadayi basin to Malaprabha basin, during the months of monsoon, for meeting the irrigation requirement, drinking water requirement etc., in the drought affected areas in the Malaprabha basin. According to the State of Karnataka, the application was filed because of the claimed un-anticipated

extreme drought conditions that had occurred in Malaprabha basin, which were capable of being taken care of, by the relief sought for in the application. Detailed and elaborate pleas were taken in the said interim application, which need not be noticed at this stage.

(ii) The applicant State of Karnataka had, inter alia, averred in the application that allocation of 7 tmc of surplus water in each year at 75% dependability available in the Mahadayi Basin at the proposed Kotni Dam site for utilisation in the Malaprabha basin under the three projects, as formulated in the amended statement of claim, would not cause any loss either to the State of Goa, or to the State of Maharashtra, since the water proposed to be lifted under the Interlocutory Application was, at present, unutilised by the State of Goa and it is running to Arabian Sea, as waste.

(iii) It was also stated in the Application that in the event the State of Karnataka succeeding in establishing its claim, inter alia for allocating 7 tmc of surplus water in Mahadayi basin, the relief prayed for will be duly accounted for, and adjusted against the overall claim of 24.15 tmc.

(iv) It was stated by the applicant State that the present stated utilisation by the State of Goa in Mahadayi basin is not more than 9.395 tmc, whereas the water available in Mahadayi basin, according to State of Goa, is 108.72 tmc, although the applicant State of Karnataka contended that the total water available is 199.6 tmc, as estimated by the Central Water Commission in its reports of October 2001 and March, 2003 and, therefore, there would be no injury or loss to the State of Goa, if the interim relief, as prayed for, were to be granted.

(v) It was pleaded by the applicant State that even with regard to future claims of the State of Goa, which is up to the year 2051, as stated in the Master Plan, the requirement is 94.4 tmc, and in the event of the State of Goa succeeding in establishing its claim before the Tribunal, and even if the total water available in Mahadayi basin is considered at 108.72 tmc, there would be no loss or injury if the State of Karnataka was permitted to lift 7 tmc of water, in view of the extreme drought situation, which were likely to persist in the future. The applicant State of Karnataka had mentioned that to the extent of 108.72 tmc there was no lis

or dispute between the party States before the Tribunal, and therefore, the Tribunal should pass an interim order in favour of the applicant State of Karnataka.

(vi) It was further pleaded in the application that an aggregate quantity of 7 tmc of water annually for lifting from river Mahadayi basin at points X-Y (1.5 tmc); X1-Y1 (5.5 tmc which includes 4 tmc to be lifted at X2-Y2) to Malaprabha River, was proposed by the applicant State of Karnataka, as identified on the Map appended to the Preliminary Report titled "Temporary Lifting of 7 tmc of water from Mahadayi Basin to Malaprabha Basin"

(vii) Various other details were mentioned and pleas taken, by the State of Karnataka, in the said IA. By and large, the aforesaid pleas were having the tenor and were in the direction of the stand which has been taken by the State of Karnataka, in its Statement of Claim dated 02.01.2013, (Vol. 10) and also Karnataka's Reply, dated 18.03.2013, (Vol. 33), to the Statement of Case filed by Goa, and further pleadings filed by the State of Karnataka, at different stages of

proceedings, either by way of amendments or replies/rejoinders to the opposite States.

(viii) It was further pleaded by the applicant State that even as per weekly reservoir storage bulletin issued by the Central Water Commission, the yield storage at Malaprabha basin, as on 05.11.2015, was only 28% as against the live storage capacity of 34.346 tmc representing shortage of 72% and, therefore, the prayer made in the application should be granted as the shortage has adversely affected the irrigation, drinking water needs etc.

(ix) The said I.A. 60 of 2015, filed by Karnataka was vehemently contested by the State of Goa. It was maintained that the said IA had been filed belatedly and with gross delay and latches and, therefore, the same was liable to be dismissed. It was also stated that the application was thoroughly misconceived and based on inflated, concocted and artificially flavoured alleged demands. Having emphasised that a party coming to the Tribunal for interim relief is required to plead, aver and prove the three mandatory predicates of having a prima facie case, balance of

convenience and irreparable loss, it was stated in the reply that the State of Karnataka had neither pleaded nor averred, leave alone adduced any proof, whatsoever, of any of these three predicates, and as the entire application was based on the public agitation, which was said to be patronised by its functionaries and politicians, and on the alleged word 'drought', as if it was a word of magic to secure returns without even mentioning or making necessary averments, the application would be liable to be dismissed.

(x) The State of Goa in reply claimed that the State of Karnataka had failed to state as to what kind of drought, as alleged, was being experienced by the said State, because there are various types of droughts such as meteorological drought, on account of lack of precipitations, agricultural drought on account of lack of moisture in the soil where crops grow, hydrological drought on account of low level of waters in reservoirs and aquifers. According to the State of Goa droughts are normally declared by the meteorologists, based on precipitation patterns, stream flow and moisture of soil, only for a long period of time, but

the State of Karnataka had not even mentioned, nor any of the documents produced by it, to indicate even remotely as to what kind of drought was being faced by the said State.

(xi) According to Goa, the water scarcity i.e. hydrological drought, is most acute in the regions where there is a lot of sugarcane plantation, and the most prominent of these areas are in Maharashtra, and on Karnataka's own admission it appeared that the same are in the Hubli-Dharwad region also.

(xii) The State of Goa had pleaded that in the case of Hubli-Dharwad region, there is a complete mismanagement of available surface and ground water resources coupled with faulty planning, as well as misuse of water, which has resulted in creation of hydrological drought, which is something completely different and distinct from hydrological drought in other parts of the country, wherein drought is only on account of meteorological reasons.

(xiii) In the reply it was maintained that the general drought management concept is that if the ground water is

managed wisely, even then in a year when the rainfall is inadequate and there is considerable diminished availability of water from surplus sources, there still would be adequate amount of ground water available, and the people would not have to face severe water scarcity. It was asserted that the said application was silent on the ground water management, and by bringing large areas under sugarcane cultivation, the aquifer has been pumped dry.

(xiv) The State of Goa had made a reference to the report of the Directorate of Sugarcane Development, Government of India (Ministry of Agriculture and Farmers Welfare, Department of Agriculture Cooperation and Farmers Welfare) and maintained that the sugarcane plantation in the Districts of Belgaum and Dharwad for the year 2011-12 was reported to be 1,78,000 Ha and 3,470 Ha, respectively, which amounted to the total area of 1,81,470 Ha and, therefore, in order to cater to the water required for sugarcane plantation in the Belgaum and Dharwad area, the total water requirement for sugarcane cultivation for the said area would come to nearly 160 tmc,

and water in such large quantities is not likely to be available from surface sources.

(xv) The State of Goa had further referred to a study carried out by the Norweign Institute for Water Research, which is an Institute in the Environmental Research, titled as “Hydrology and Water Location in Malaprabha” and asserted that 50% of the severity of the drought could be reduced by reducing the area under sugarcane cultivation by 56%.

(xvi) The State of Goa had Specifically mentioned that the requirement of water, and the demand, of the State are much more than the mere requirement of 94.42 tmc, because there are navigational channels in the Cumbarjua Canal, connecting the Mahadayi river to Zuari river, and connecting Mormugoa Port and other ports, including the Panaji Port etc., wherein a particular draft is required for the vessels entering in Mahadayi river and in the event of any kind of aberration, whatsoever, by the upstream State of Karnataka, or State of Maharashtra, the level of water in the river would get depleted, and this would result into

lesser draft in the water level in Mahadayi river, thereby creating obstructions, to navigation within the Mandovi river, which activities are of utmost necessity and for the economic and socio-ecological reasons of the State and its people.

(xvii) According to the State of Goa, in the year 2015-16, and even later on, the water level continued to be below required level, whereas so far as Anjunem Dam is concerned, it was below the Full Reservoir Level, and at Ganjem the water level having gone down that year, the drinking water scheme project which pumps water from Mahadayi into Khandepar river had become dysfunctional, on account of low level, and the State of Goa had to resort to taking water from the surrounding areas, and put the water pumped from the mining pits in Khandepar river, so as to resolve the acute drinking water shortage in the State.

(xviii) The State of Goa had mentioned that the claim of the State of Karnataka that the Districts of Hubli-Dharwad were reeling under water severity was difficult to accept for the

simple reason that the PepsiCo unit in Dharwad is being supplied with four lakh litres of Malaprabha water per day, which would satisfy the house-hold domestic requirements of at least 16,000 people, but no steps had been taken to reduce the quantity of water being supplied to PepsiCo's Dharwad unit.

(xix) The State of Goa asserted that the State of Karnataka was planning/soliciting proposals to set up various industries in the industrial sector of Hubli-Dharwad region, and as reported in the web site of the Ministry of Micro, Small & Medium Enterprises, the State of Karnataka had 345 factories in the Dharwad District, as on 31.03.2009, whereas the proposed industrial area in Dharwad district is in 3306.19 Ha, out of which 2314.73 Ha of land had been developed for industrial sectors, and to set up huge industries, despite the alleged claims of water scarcity.

(xx) According to Goa, the extent of areas shown for sugar cane cultivation had multiplied several times than what it was earlier, using the entire water for the purpose of cultivating a water guzzling crop such as sugar cane. It was also

mentioned that the State of Karnataka had failed in its approach of conceiving, as well as planning, and thereby had created an artificial shortage of water by faulty planning and mismanagement of the available water resources.

(xxi) One of the important facts pointed out by the State of Goa in its Reply was that the State of Karnataka had proposed to carry out such a massive project by constructing ducts and canals, under-ground tunnels by changing the topography, landscaping and cutting down trees, that too through a sanctuary, without obtaining any permission, either under the provisions of the Environment Act, 1986, or the Wild Life Protection Act, 1972, or any other relevant law and, therefore, the application should not be entertained. After having pointed out the fact that the State of Karnataka was a party to the judgement and order of the Supreme Court of India, which required that prior to undertaking and carrying out of any project on an Inter-State river, a State is required to obtain prior permission of the Central Government and Planning Commission, it was stated that no such permissions had been obtained by Karnataka at all.

(xxii) It was further pointed out that the State of Karnataka had disregarded provisions of the Environment Protection Act, Bio-Diversity Act, Bio Diversity Convention, The Forest Conservation Act, The Wildlife Act, and several other laws and regulations, and had undertaken and carried out the massive construction and was now seeking to divert the river from a deficient basin to a surplus basin, which is not permissible at all.

(xxiii) Besides the defences, which have been noticed in the above paragraphs, the State of Goa, took many other pleas/objections, which were on the lines and tenor of the pleas which it had raised in its Statement of Case, (originally filed or amended later on). Therefore, it would not be necessary to notice the same at this stage.

(xxiv) A rejoinder was also filed by the State of Karnataka, in which the various pleas raised by the State of Goa were controverted and the pleas raised by Karnataka in the interim application were reiterated.

(xxv) The State of Goa chose to file a sur-rejoinder. A reference was made to the contention raised in original statement of

claim filed by the State of Karnataka on 2.1.2013, (Volume 10), and attention of the Tribunal was drawn to the contention raised at Page 85, to the effect that "therefore, the entire projected water requirement of Goa that includes the total planned uses of 94.40 tmc (which is totally unrealistic and unjustified) and the environmental needs of 6.50 tmc comes to about 100.90 tmc annually (not admitted)" to emphasise that on the admission of the State of Karnataka, it was apparent that the figure 94.40 tmc, does not include requirement of water for environmental needs.

Having asserted that the State of Goa had not admitted that the total requirement of the State of Goa was limited only to 94.42 tmc, or that there was an alleged surplus of 7.94 tmc, it was pleaded that the demand of State of Goa, particularly of environmental needs, were present day requirements and therefore, lifting of 7 tmc should not be permitted.

39. Vide a detailed Order dated 27.07.2016, the aforesaid I. A. No. 60 of 2015, along with the ancillary I.A. No. 66 of 2016, were dismissed. In these circumstances, the pleas, in support of

the diversion channel of Kalasa-Bhandura, and counter pleas opposing the said construction and other activities for execution of the aforesaid project, by the State of Karnataka and State of Goa, respectively, would not be necessary to be noticed here.

40. However, some more pleas raised by the State of Goa, which would also be relevant, have been culled out from pleadings, which require to be noticed are as under:-

(a) The State of Goa asserts that the Apex Court has ruled that though the waters of an interstate river pass through the territories of the riparian States such waters cannot be said to be located in any one State.

(b) It is stated that “Mahadayi” river is in a state of flow and under no circumstances can Karnataka claim exclusive ownership or right to divert any part of the water so as to deprive Goa of its equitable share to meet its reasonable uses. What is asserted is that any project undertaken or likely to be undertaken by an upper riparian State may/will prejudice the rights of the lower riparian states and affect the available water flow of Inter-State River and hence the

need for concurrence of other riparian States is to be obtained before taking River. It is stated and submitted that Small Rivulet at its Basin in the State of Karnataka is less than 0.20% of the total area of the State of Karnataka and in contrast, Madei River is virtually the lifeline in so far as the State of Goa is concerned. It is maintained that the Madei basin in so far as the State of Goa is concerned, constitutes 42.70% of the total area of the State of Goa and taking into consideration such perspective, it is submitted that urgent Interim Orders are imperative in order to prevent the State of Karnataka from presenting “fait accompli” and further, from heaping upon the State of Goa disastrous consequences.

(c) It is pleaded that Maharashtra’s project proposals in Mahadayi Basin are also causing similar prejudices and disastrous consequences to Goa as the said projects are also planned in a manner affecting the downstream flow in River Valvanti, a tributary of River Mahadayi. As stated elsewhere in this submission, Maharashtra’s original plan of constructing a dam across River Valvanti designed as water conservation structure to store monsoon flow with arrangement to release water to downstream Goa region

during lean season to keep the lean season flow to Goa's region of Mahadayi River was acceptable. It would have caused an additional prejudice to Karnataka's planning of damming Haltar Nallah at its origin and to annex the water shed at the upstream portion of the dam to Krishna basin as has been in progress in Kalsa Nalla.

It is pointed out that however, State of Maharashtra on its own volition and without discussion and consent of Goa had shifted the dam alignment to Katika Nalla, a sub – tributary of Haltar Nalla and even started speaking the language of defiant Karnataka that there is no consent of the lower riparian State or environmental impact assessment is required for constructing water retention structure in a tributary even if it is of an interstate river.

(d) State of Goa submits that the State of Karnataka has not carried out any Dam Break Study or Dam Break Analysis for any of the proposed Kalsa Dam, Haltara Dam, Bhandura Dam, Kotni Dam and Irti Dam and it is therefore apparent that the State of Karnataka is seeking to go ahead with the construction of the aforesaid Dams without paying any heed to the safety aspects of the people residing in the

downstream areas of the said Dams, including the human and wildlife population within the State of Goa.

(e) The State of Goa asserts that it has a very high dependency on water related economy based on tourism, fishing, agriculture, forest, flora and fauna, navigation, inland water ways, transportation through barges for the purposes of mineral ore, loading and unloading from various areas in Goa at jetty points to Mormugoa Harbour to Panaji Port, all of which is through the navigational channels in the Mhadei basin. Consequently, any change in the water resource/abstraction/diversion of any kind whatsoever will have disastrous impact not only on the economy, ecology but also on the entire river basin itself.

(f) The state of Goa submits that any use, utilization of water, construction of project, diversion in any river by any person, authority or state is subject to the provisions of the constitution of India and more particularly fundamental rights contained in the Constitution of India. It is pointed out that the state of Karnataka does not have any right, to breach the constitutional provisions in their attempt to divert the water flow from the Mhadei River. Any such

action is curtailed and subject to the constitutional provisions.

(g) The state of Goa submits that the state of Karnataka cannot breach or violate the fundamental rights guaranteed under article 14, article 19(1)(g) of the constitution of India upon the citizens residing in the state of Goa and more particularly Mhadei basin whereas the state of Goa is bound to respect and protect the rights of the citizens in the Mhadei basin and the state of Goa.

It is emphasized that the high-handed action on the part of the state of Karnataka to commence construction and attempt diversion of water from river Mhadei is in direct breach of the fundamental rights of the people of Goa and the inhabitants of Mhadei basin.

(h) It is stressed that there is complete breach of article 14 of the constitution of India and the manner in which the state of Karnataka has acted and conducted itself shows complete disregard to the rule of law which is a facet of Article 14 of the Constitution of India. It is mentioned that the entire project has been started by the state of Karnataka without any permission from any of the statutory authorities including authorities under the environment protection Act,

Wildlife Protection Act, Forest Act etc., and the untoward hurry and haste which the state of Karnataka has shown in commencing the work at the site without any study and impact on the environment, ecology and people in the Mhadei basin itself shows highhandedness, arbitrariness and unreasonableness which is in gross violation article 14 of the constitution of India.

(i) It is asserted that the proposed actions would subject the population to poverty and penury and the source of earning of the people would be completely destroyed as there would be disastrous effect on the agriculture, fishery, etc. Thus, it is demonstrated that there is direct infringement on the fundamental rights conferred under article 19(1)(g) of the constitution of India.

The state of Goa submits that the standard of living in terms of ecology, fresh air, fresh water, is a facet of Article 21 of the Constitution of India and the action of the state of Karnataka would destroy environment, ecology, by destruction of forest, wildlife, flora and fauna etc., which would therefore directly infringe the lives of people of Goa and the Mhadei basin. Such actions are therefore in

complete infringement of Article 21 of the constitution of India.

(j) The State of Goa submits that Article 48A enjoins the state to protect the environment, safeguard the forest and protect the wildlife, but the action of the state of Karnataka to divert/store, create dam, embankment or any abstraction of any kind whatsoever of the water from the Mhadei basin would certainly destroy the environment, forest and the wildlife as narrated herein above.

(k) The state of Goa submits that reliance placed by state of Karnataka on entry 17 of list II in the seventh schedule is completely misconceived and misplaced in facts and circumstances of the case. The state of Goa submits that "water" so referred to in Entry 17 in list II of the seventh schedule cannot be interpreted to such an extent that it would include an inter-state river within its ambit and in fact, the legislative field of the state Government is subject to the provision of Entry 56 of List I. It is submitted on behalf of State of Goa, that in terms, entry 56 relate to the regulation and development of inter-State rivers and river valleys to which such regulation and development under the control of the union which is declared by the Parliament to

be expedient in public interest. The State of Goa states that the Parliament of India in terms of Entry 56 of List I of Seventh Schedule has already enacted a law namely Inter-State Water Disputes Act, 1956, wherein any dispute which is raised by the central Government in terms of Section 3 of the said Act, may be referred to the water dispute tribunal for its adjudication.

41. In the light of the above pleas, noticed in detail in the above paragraphs, the State of Goa has sought reliefs, to which reference is made earlier.