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 - XI

(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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DECISION AND FINDINGS BY THE TRIBUNAL ON IMPORTANT QUESTIONS CONTD……

ECOLOGY:

924. The Tribunal notices that the issues mentioned below relate to effect of diversion of Mahadayi River by the State of Karnataka and State of Maharashtra on ecology. They are closely interlinked with each other. Therefore, the Tribunal proposes to deal with them together and give answer to the same.

925. Issues Nos. 5, 11, 16, 18, 19, 21, 22, 23, 30 and 32 are interlinked with each other and they are reproduced as under:

> "5. Whether the State of Goa establishes that after assessing and deducting from the available waters of river Mahadayi required for ecological sustenance of the River valley eternally, specifically giving due consideration of the scientifically predicted global warming, sea level increase, increased salinity ingress in coastal areas, etc., the share of all the riparian States should be determined on the basis of remainder water available from river Mahadayi?"
>
> "11. Whether the State of Goa establishes that the equitable share of three co-basin States in the quantity

of water available from river Mahadayi should be adjudicated after taking into consideration the long term in-basin needs of the three States for the purpose of domestic water supplies, irrigation, hydro-power generation, navigation, pisciculture and environmental project?"

"16. Whether the State of Goa establishes that with the impact of global warming, 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 and also impact process of sedimentation if the proposed diversion is effected?"

"18. Whether the State of Goa establishes that the proposed diversion schemes of the States of Karnataka and Maharashtra will cause severe and irreparable damage and loss to the forests, wildlife, other organic life and bio-diversity stratosphere of the area in the Mhadei basin particularly in the upstream areas and overall ecology of the Mhadei river basin?"

"19. Whether the State of Goa establishes that the proposed diversion schemes of the States of Karnataka and Maharashtra 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 etc.?"

"21. Does the State of Goa prove that diversion of any kind by the State of Karnataka and the State of

Maharashtra of interstate waters of river Mahadayi by going against the natural flow of water will degrade and adversely impact the ground water flow Pattern, the tributaries and will affect the ecology of the Riparian as well as upper Stream areas?"

"22. Does the State of Goa prove that the biological hotspot of Western Ghat sustain and help to maintain global equilibrium of temperature and other ecological balance and that such a unique hot spot cannot be lost by permitting diversion of the interstate Mahadayi River water?"

"23. Whether the State of Goa proves that responsibility of maintaining the flow of water for aquatic and terrestrial ecology and environment in the Western Ghats in the State of Goa is not the sole the responsibility of the State of Goa and that the other co-riparian State of Karnataka and Maharashtra have an equal responsibility in that regard?"

"30. Whether the State of Goa proves that the States of Karnataka and Maharashtra cannot undertake the works of the nature proposed, in an inter-state river, without undertaking any study, analysis, whatsoever in order to estimate the adverse effect of such projects on environment, flora, fauna, wildlife, fishing, agricultural activities, aquatic eco-system, within and outside the States of Karnataka and Maharashtra as well as have negative impact on the lower riparian State of Goa, and the flow of water into the inter-State river?"

> "32. Whether the State of Goa proves that Article 21 of the Constitution of India which is an Injunction against the State clearly specifies the duty on the part of the State of Karnataka and State of Maharashtra to undertake such Environment Studies to ensure protection of Ecological Environment, healthy living of the people likely to be effected within the basins of Mahadayi, inside and outside Karnataka including the riparian States of Goa?"

926. The Tribunal finds that the effects of diversion of water by State of Karnataka and State of Maharashtra from Mahadayi River, on wild life, are mentioned, by the State of Goa in several paragraphs of its Amended Statement of Claims (Volume 131) i.e., paras 21, 21A, 21B, 21G, 27, 29, 33, 45, 56C, 58K, 154C, 160, 167, 169, 177C, 185, 190A, 190B, 190C(iv), 190C(v), 190C(vi), 190C(vii), 190C(xii), 190(xiii), 190C(xvi), 190C(xvii), 190C(xviii), 190C(xxi), 190C(xxii), 190C(xxiii), 190C(xxiv), 190C(xxv), 190C(xxviii), 190C(xxxiii), 207, 213, 224, 224D, 224E, 224I, 224K, 224M.

927. As far as ecology is concerned, the relevant paragraphs to be found from Volume No. 131, are 55, 56J, 56Y, 56ZE, 56ZQ, 58A, 58L, 58N, and 154C.

928. So far as effect on environment is concerned, the Tribunal notices that necessary averments have been made in paragraphs 57, 190C(vii), 204 and 206 of the Amended Statement of Claims (Volume 131).

929. As far as effect of salinity ingress is concerned, relevant averments are to be found in paragraphs 178C(iii), 56, 56ZC, 56ZD, 56ZK, 56ZL and 203 of the Amended Statement of Claims (Volume 131).

930. So far as adverse effects on fisheries are concerned, they are detailed in paragraphs 58, 58C, 58D, 58F, 58H of the Amended Statement of Claims (Volume 131).

931. As far as Flora and Fauna are concerned, the Tribunal notices that the relevant averments are made in paragraphs 21C, 21E, 21F, 56ZQ, 154C(xii), 154C(xvi), 190C(xiv), 224 and 224A of the Amended Statement of Claims of the State of Goa (Volume 131).

932. The measures taken by the State of Karnataka to conduct Environmental Impact assessment Study for Goa region

in consultation with Government of Goa are mentioned in paragraphs 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.8, 2.9, 2.11, 2.12, 2.16, 2.17, 3.7 and 3.8 of Volume No. 129.

933. The Tribunal notices that all the averments made in the above mentioned paragraphs, either by the State of Goa or by the State of Karnataka, have been dealt with, in great detail, while referring to their respective pleadings and, therefore, the Tribunal is of the opinion that it is not necessary to incorporate all the above mentioned paragraphs at this stage to avoid repetition.

934. The Tribunal notices that regarding adverse effects or otherwise on the wild life, ecology, fisheries, flora and fauna, salinity ingress etc., the State of Goa has examined Shri Chetan Pandit as AW1, Shri Paresh Porob AW2, Dr. Shamila Monteiro AW3, Shri Rajendra P. Kerkar AW4 and Shri Subrai T. Nadkarni AW5, whereas the State of Karnataka has examined Prof. A.K. Gosain RW1 and Shri A.K. Bajaj RW2, in support of their respective cases.

935. Shri Atmaram N.S. Nadkarni, the learned Senior Counsel, representing the State of Goa, has pointed out and relied upon evidence of AW2, AW3 and AW4, apart from drawing the attention of the Tribunal to the oral submissions made by him, which are to be found out on pages 56 to 68 of the Notes of Arguments of the State of Goa (Volume 237), to stress that there would be adverse effect on wild life, ecology, environment, fisheries, salinity ingress and flora and fauna, if the State of Karnataka and the State of Maharashtra are permitted to divert water from Mahadayi river. The learned Counsel has pointed out and relied upon the publication of Shri Paresh Porob AW2, a book on 'Biodiversity in Goa' in support of his arguments. According to Shri Nadkarni, the learned counsel for the State of Goa, the narration made in publication of Shri Paresh Porob identifies the water bodies, that the wild life is dependent on the water needs. It is pointed out that, Shri Paresh Porob has relied on study of International Union for Servicers of Nature, titled 'Key Biodiversity Areas'.

936. The learned Senior Counsel for the State of Goa has also relied upon portions of the evidence from the testimony of AW3 and AW4 as well as the Official Gazette of the Goa Forest

Policy and maintained that the State of Karnataka is not entitled to any of the reliefs, since it has failed to discharge its burden on these issues, cast upon it and on the contrary, the State of Goa, through its witnesses, has been able to establish that, it would seriously suffer, if the State of Karnataka is permitted to proceed with the proposed obstruction of natural flow of waters in Mahadayi Basin.

937. Shri Shyam Divan, the learned Senior Counsel representing the State of Karnataka, has argued that India is a complex environment regulatory regime comprising several Statutes and subordinate legislations in the form of Rules, Regulations and Statutory notifications, and the statutory regime is supplemented by large number of judgments rendered by the Hon'ble Supreme Court of India as well as the High Courts, in their respective public interest litigation jurisdictions. As a result, every new project in India is subject to a rigorous process of evaluation from the environment standpoint, before the project is commissioned. The learned Senior Counsel Shri Divan has pointed out the relevant legislations and also the EIA Regulations and has contended that the EIA Regulations, envisage the process for obtaining environmental clearances in the following four

stages, broadly depending upon the categorization of project – (a) screening (b) scoping, (c) public consultation and (d) Appraisal. While elaborating his submissions, the learned Senior Counsel Shri Divan has maintained that the appropriate stage for assessing the environmental impact is not at the time of allocation of waters of an Inter-State River between the riparian States, but before the project is initiated. According to him, from environment perspective, India has a set of uniform laws and at the stage of evaluating environmental impacts, the State boundaries are not relevant and the impact assessment agencies will assess all impacts, both, within Karnataka and beyond that too, where a project is located within the State, which has a potential of affecting the environment of a neighboring State. Further, it is emphasized by him that on a proper appreciation of the Environment Regulatory Regime in India, the jurisdictional authorities who study the impacts on wild life, forests, fisheries, salinity etc., try to find out adverse impacts, if any, at the stage of granting clearances. What is emphasized by the learned Counsel Shri Divan is that having regard to these specialist functions and duties, subject to appellate review, which will be carried out at a subsequent stage, it would not be appropriate for this Tribunal to

turn down the State of Karnataka's entitlement for a suitable allocation of waters of River Mahadayi for its beneficial uses.

938. Shri Divan has further contended that first considering the involvement of an Inter-State River, there is need for clarity regarding the water allocation, amongst the Riparian States and once a Riparian State has secured an allocation of water, in the second stage, that State, say Karnataka, will approach the Regulatory Authorities charged with an environment protection, with a project proposal that mitigates environmental impacts. The learned Senior Counsel Shri Divan has explained that the third stage involved is scrutiny of the environment management plan, environment impact assessment studies etc., by the expert Appraisal Committee and clearances by the EIA Authority, whereas, the fourth stage, after appellate review, if any, will involve the execution of that project, incorporating all the statutory safeguards, to protect the environment, that are prescribed, as conditions in the environmental clearances. In support of his submissions, Shri Divan has relied upon number of decisions rendered by competent Courts.

939. Shri D.M. Nargolkar, the learned counsel representing the State of Maharashtra, on environmental flow and other needs of the State of Goa, has especially pointed out that to the relevant issues and also relevant questions and answers given by AW2, AW3 and AW4, to maintain that the evidence of these witnesses establish that the of the State of Goa – (a) has not estimated the impact of global warming on water availability in Mahadayi Basin; (b) has not estimated quantity of losses in each project, due to increase in evapo-transpiration, direct evaporation from water bodies, reservoirs, canal surfaces, farms etc. (c) has not done any scientific study relating to sea level increase and increased salinity ingress; (d) has not undertaken in-depth scientific evaluation of prioritization; (e) has not undertaken any study in respect of sediment flow; (f) has not conducted studies in respect of effect of diversion of water by State of Karnataka and State of Maharashtra on the agriculture of Mahadayi River Basin and the ground water flow pattern; (g) has not scientifically worked out the environmental needs; and has projected the needs for the State of Goa, without discounting for needs met with, from import of 261 Mcum from Maharashtra thereby accepting the augmentation of water in Mandovi Basin.

940. The learned Counsel Shri Nargolkar has placed reliance on what is stated at pages 49 to 65 of ARGUMENT NOTES BY THE STATE OF MAHARASHTRA (Volume 221), and has pointed out deficiencies in the evidence tendered by AW2, AW3 and AW4.

941. The Tribunal is of the firm opinion that, in the light of the settled principles in relation to the environmental jurisprudence, there cannot be any dispute or controversy that the environment, ecology, forest, wildlife, etc. are to be protected. It is, no doubt, an established fact that, ecological disaster has to be avoided, prevented and the ecosystem, as such does not recognize any political boundaries. This Tribunal, need not overemphasize, the importance of the life, the health and the ecology and equally the importance of the water being essential to protect all facets of nature.

942. In this regard the Tribunal finds that salutary principles have been laid down in Articles 48, 48A and 51A(g) of the Constitution of India. These Articles are reproduced herein below:

> "48. Organisation of agriculture and animal husbandry- The State shall endeavor to organize agriculture and animal husbandry on modern and scientific lines and shall, in particular, take steps for preserving and improving the breeds, and prohibiting the slaughter of cows and calves and other milch and draught cattle."

Whereas Article 48A reads as:

> "48A. Protection and improvement of environment and safeguarding of forests and wild life - The State shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country."

And Article 51A(g) reads as under:

> "51A. Fundamental duties – It shall be the duty of every citizen of India –
>
> > (g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;"

943. In Subhash Kumar Vs. State of Bihar AIR 1991 SC 420, (1991) 1 SCC 598, the Hon'ble Supreme Court of India has firmly ruled that Articles 14-21 and 51A(g) must be read together. What is relevant to notice is that in M.C. Mehta Vs. Union of India (1992) Supp. (2) SCC 85 (633, 637), a law is laid down by the

Hon'ble Supreme Court of India that duty under Article 48A can be enforced through a letter based on Article 21.

944. Article 48 consists of two parts – the first part enjoins the State to "endeavor to organize agricultural and animal husbandry" and that too on modern and scientific lines. The emphasis is not only on 'organization' but also on 'modern and scientific lines'.

945. Article 48A deals with "environment, forests and wild life". These three subjects have been dealt with in one Article for the simple reason that, the three are interrelated. Protection and improvement of environment is necessary for safeguarding forests and wild life, which in turn protect and improve the environment. Thus, forests and wild life are not only clearly interrelated and interdependent, but they protect each other. Article 48A mandates that the State shall endeavor to protect and improve the environment to safeguard the forests and wild life.

946. Article 51A(g) of the Constitution enjoins that it shall be the duty of every citizen of India, inter alia, to protect and

improve the national environment including forests, lakes, rivers, wild life and to have compassion for living creatures. These two Articles, are not only fundamental in the governance of the country, but also, it is the duty of the State to apply these principles in making laws and further these two Articles are to be kept in mind in understanding the scope and purport of the fundamental rights guaranteed by the Constitution, including articles 14, 19 and 21 and also the various laws enacted by the Parliament and the State Legislatures. The provisions of article 48A of the Constitution are required to be construed as a part of the principle contained in Article 21 of the Constitution. A statute may not be ultra vires to Article 48A itself, if it is not otherwise offensive to Articles 14 and 21 of the Constitution. In Subhash Kumar (supra), read with Article 51A(g), 14 & 21, the Hon'ble Supreme Court has drawn the following conclusions:-

> "(a) It is a constitutional duty not only of the State but also of every citizen to protect and improve the environment and natural resources of the country;
>
> (b) Though neither Article 48A nor Article 51A is judicially enforceable by itself, it becomes enforceable through the expanding interpretation of article 21, so that in case of a failure of the foregoing duties, the Supreme Court or a High Court, would entertain a

> petition under Article 32 or 226, as a Public Interest Litigation brought by any individual or Institution in the locality or any social action group, even by letter."

947. The natural resources of air, water and soil cannot be utilized, if the utilization results in irreversible damage to environment. There has been accelerated degradation of the environment primarily on account of lack of effective enforcement of environmental laws and non-compliance with the statutory norms. Constructing of dams or diversion projects are hazardous in nature. They impair the ecology and people's right to natural resources. The entire process of setting up and functioning of dams, reservoirs, water basin transfer projects, require utmost good faith and honesty on the part of those who propose those constructions. Such constructions have a tendency to degrade environment and is likely to affect air, water and soil and impair the quality of life of inhabitants of the area. Therefore, fullest disclosures including the potential for increased burdens on the environment, consequent upon possible increase in the quantum and degree of pollution, has to be made out, at the outset so that the public and those concerned including the authorities, may decide, whether the permission can at all be granted for carrying on such big constructions. When questioned,

the regulating authorities have to show that, they acted in the manner enjoined upon them. Where they, either connive or act negligently by not taking prompt action to prevent, avoid or control the damage to environment, natural resources and people's life, health and property, the principles of accountability for restoration and compensation have to be applied.

948. Having noticed the salutary objects of Articles 48, 48A and 51A(g) of the Constitution, this tribunal proposes to consider the issues which have been referred to earlier.

949. Shri Chetan Pandit, AW1, in reply to question No. 117 has stated as under:

> "… there are certain major differences between the Cauvery and Krishna on one hand and the Mahadayi on the other. The two most important differences are, in Mahadayi basin there are four wild life sanctuaries and one bird sanctuary within a very small area of about 2032 Sq. Kms. Second, the Cauvery and Krishna basins already have a lot of human interventions and river valley projects. In contrast the Mahadayi basin is what hydrologists call a virgin basin. It is in Western Ghats which are identified as a hot spot of bio-diversity of global importance. The panel appointed by the Ministry of Environment and Forests under the

Chairmanship of Prof. Madhav Gadgil went to the extent of recommending a blanket ban on all water resources projects in Western Ghats and particularly and specifically recommended against any diversion of water from one basin to another. Thus, it would be seen that Mahadayi basin is in no way comparable to Krishna or Cauvery."

950. On the aspects of ecology, question No. 178 was put to Shri Pandit i.e. AW1. The question and the reply are as under:

"Q.No.178. At Para 66, page 27 of your Affidavit, you have suggested that a "detailed study needs to be carried out of the ecology of the Mandovi river valley and its dependence on the river flow for its sustenance". You have not mentioned as to who should carry out the study suggested by you. Please tell us how the suggested study would help in better assessment of the water availability of the basin.

Ans. The water availability in the basin means the total water available on 75% or 50% dependability basis in a scenario of no human intervention. This is to be determined by a hydrologic study and that study has been made and submitted. A certain quantity of water from the total water available will have to be reserved for ecology and environment. This quantity will have to be determined by conducting an ecological study. Several different methods have been proposed by different researchers and I have briefly outlined some of them in my affidavit. However, all these methods

> can only indicate how much water will be required to achieve certain environmental objectives; or conversely indicate what might be the environmental impact for a given quantity of water reserved for the environment. Eventually a decision will have to be taken by an appropriate authority as to the environmental objectives to be achieved and accordingly, that authority will have to decide the quantity of water to be allocated for achieving these objectives, at various places in the river. In my affidavit my objective was to lay the foundation for establishing the importance of environmental flow. However, suggesting any particular agency for carrying out the environmental study was beyond my scope."

951. It is also noticed by the Tribunal that AW2 Shri Paresh Porob, has deposed on the aspects of wild life forests and flora and fauna. This witness has reiterated the contents of his affidavit dated 11.11.2017, which was signed on 14.11.2017 (Volume No. 209), including Annexure A (Colly). This witness has also filed Additional Affidavit with additional material on 17.11.2017 (Volume No. 214).

952. AW2, in his elaborate affidavit and additional affidavit has stated that he had been Associated with the forests of Mahadayi since 1989, i.e. even before its declaration as a Wild Life Sanctuary in 1999 and that during his quest for wildlife

observation, he had been exploring the Mahadayi Forest area and had carried out various graphic media documentation of the rich biodiversity in the area. After referring to para 13 of the National Forest Policy 1988, the witness has stated that International Union for Conservation of Nature has identified Bhagwan Mahaveer National Park and Madei Wild Life Sanctuary as Bio diverse areas in India. According to him, the criteria adopted for this identification are – (i) Threatened Biodiversity, (ii) Geographically restricted, (iii) Ecological integrity, (iv) Biological processes and (v) Irreplaceability, which show that both the wildlife sanctuaries situated in Goa, are internationally recognized and are heritage sites of our country. In para 21 of his additional Affidavit-in-Evidence (Volume 214) the witness has, in terms stated that the proposed diversion, will reduce the flow in River Madei and as a result of this, there will be complete drastic adverse effect on the ecology, wild life and flora and fauna. The Tribunal notices that, on these aspects, this witness has not been cross-examined by the State of Karnataka and therefore, the evidence tendered by the witness relating to adverse effect on wild life etc. will have to be accepted by the Tribunal.

953. Relevant questions put to the witness Shri Paresh Porob, in his cross-examination, are 2, 4, 13 and 23. Therefore, the said questions with answers are quoted herein below:-

> "Q.No.2. You have also deposed in your affidavit on the subjects of tidal back-water flow and salinity in para 48 and Mangroves in para 25. These matters relate to river ecology or aquatic environment. Is that right?
>
> Ans. Yes, it is correct."
>
> "Q.No.4. The availability of water in a stream varies from season to season and also from year to year and species. Therefore, the Flora and Fauna have inherent biological character of adaptability to the changing water regime. What do you say?
>
> Ans. Yes, I agree."
>
> "Q.No.13. The wildlife habitat in the Madei Wildlife Sanctuary depends upon the water not only from Mahadayi river but also from several streams and nallahs which flow in Madei Wildlife Sanctuary. Is that right?
>
> Ans. Though Madei Wildlife Sanctuary has several monsoon fed streams apart from Surla and Mahadayi, but most of the other streams go dry after the monsoon and wildlife habitats of Madei Wildlife

Sanctuary entirely depends on Surla and Mahadayi rivers."

"Q.No.23. I show to you a copy of the Berlin Rules on Water Resources, framed by International Law Association, Berlin Conference (2004). In Article 22, it is stated that "States shall take all appropriate measures to protect the ecological integrity necessary to sustain ecosystems dependent on particular waters". In Article 7, it is stated that "States shall take all appropriate measures to manage waters sustainably". Further, in the commentary, it is specifically mentioned that – "The recognition of sustainability as a basic principle of international water law thus is essential to assure the effective balancing of development against important social, environmental, and ecological values". However, in your affidavit concluding in Para 58, you have stated that "any sort of diversion, obstruction or aberration will result in adverse impact on six wild life sanctuaries and will disturb ecological balance. …" I, therefore, put it to you that the conclusions are wholly contrary to the concept of sustainable development, because instead of balancing between the development and protection of aquatic environment, you have been advocating an extreme argument in favour of maintenance of natural flows in the river (para 57 of the affidavit). What do you say?

(PER TRIBUNAL: The learned counsel for the State of Karnataka has handed over a copy of the FOURTH REPORT prepared by International Law Association BERLIN CONFERENCE, (2004), WATER RESOURCES

LAW. The aforesaid document is taken on record and marked as MARK/KA-16).

Ans. I have not gone through these Rules and, therefore, I will stand by my affidavits as environmental stability is most important for having eco-centric approach towards conservation and not anthropo-centric. The eco-centric approach includes eco-systems, flora, fauna and humans, whereas in anthropo-centric approach humans are given priority above flora and fauna, which can have devastating effect on environment.

However, I may add that although I am not aware of these Berlin Rules, referred to in the question, as stated by me above, but for my affidavits I have relied upon National Forest Policy of 1988, annexed as Annex. C and National Bio-diversity Action Plan, 2008, annexed as Annex. E. These two policies have been framed by Government of India."

954. A specific question No. 6 was put by the learned Counsel for the State of Maharashtra to this witness which is as under:

"Do you agree that any sort of diversion or utilisation by any of the States, including the State of Goa, in future, in Mahadayi basin would result in adverse impact and would disturb the ecological balance, resulting in total disaster in Mahadayi basin?"

The answer given by the witness was as under:

"Yes, I agree."

955. The question No. 3 put to this witness by this Tribunal was and answer given by him are reproduced as under:

> "Q.No.3. At Para 13, page 10 of your Affidavit dated 11.11.2017 (Volume 209), you have stated as under.
>
> > "I state that as forest officer we were made aware of National Forest Policy 1988 which clearly states "that the principle aim is to maintain environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms including Humans". The National Forest Policy also states that derivation of direct economic benefit should be in sub ordinated to this principal aim. I state that if proposed project for diversion of Madei River waters is allowed, it will be harmful to the ecology. Further, it will also adversely affect the Wildlife Sanctuaries and in general, it will also definitely defeat the principle aim of the National Forest Policy 1988."
>
> We find that the principal aim (and not the principle aim as stated by you in your affidavit) of the National Forest Policy 1988 (already on record as MARK-

GOA/16(Colly)) has not been correctly quoted by you. The Para 2.2, which is part of the Para 2. BASIC OBJECTIVES, states as under:

> "2.2 The principal aim of the Forest Policy must be to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms including human, animal and plant. The derivation of direct economic benefit must be subordinated to this principal aim."

It must be appreciated that the statements and provisions of any policy are to be seen in totality after due consideration of all aspects. We find that Para 4.4.1 of the National Forest Policy 1988, inter-alia, states as under:

> "… Diversion of Forest land for any non-forest purpose should be subject to the most careful examinations by specialists from the stand point of social and environmental costs and benefits. Constructions of dams and reservoirs, mining and industrial development and expansion of agriculture should be consistent with the needs for conservation of trees and forests. Projects which involve such diversion should at least provide, in their investment budget, funds for regeneration/ compensatory afforestation."

Obviously, the National Forest Policy 1988 lay due emphasis on careful examination of various projects of social needs from the stand point of social and environmental costs and benefits. Such projects, inter-alia, include dams and reservoirs.

Please tell us whether you examined the social and environmental costs and benefits before arriving at the conclusion that 'if proposed project for diversion of Madei River waters is allowed, it will be harmful to the ecology' and that 'it will also adversely affect the Wildlife Sanctuaries and in general, it will also definitely defeat the principal aim of the National Forest Policy 1988'. If yes, please tell us the details and the Para of your Affidavit, where such details are furnished. If not, why such issues were not examined in accordance with the provisions of Para 4.4.1 of the National Forest Policy 1988?

Ans. The Government of Goa has notified various wildlife sanctuaries along the stretch of Western Ghats of Goa, for water security and maintaining ecological balance. The socio-economic conditions of the inhabitants of these areas are dependent on Western Ghats in Goa. In my earlier Affidavit, dated 11.11.2017(Volume 209), para 46, page No.27, I have stated about man-animal conflict and its implications on the socio-economic condition of the people. The water flowing out from the wildlife sanctuary is being utilized by people for cultivating in a traditional practice which is mentioned at para 55 at page 31 of my Affidavit, dated, 11.11.2017.

> While preparing my two Affidavits I was conscious of the National Forest Policy, 1988."

956. AW3, Dr. Shamila Monteiro, on behalf of the State of Goa has deposed on the aspects of fisheries. She has specifically stated that the rivers/estuaries act as natural nursery grounds and any adverse impact can have far reaching consequences on the pelagic and demersal fisheries. According to her, Mahadayi River System is divided into two major ecosystems i.e. (a) complete fresh water ecosystem from the source up to Ganjim and (b) estuarine ecosystem from Ganjim up to the mouth of the river. She has further mentioned that during the non-monsoon period, the lower estuaries of both Mandovi and Zuari become an extension of the sea due to tidal sea water intrusion. According to her, after the withdrawal of monsoon, runoff decreases rapidly and by November it reaches negligible levels, which results in a large horizontal salinity gradient from Mandovi-end to the Zuari-end. She has pointed out that fresh water diversion will adversely affect the nutrient rich mangrove area, which in turn will affect the survival of juvenile fish, bivalves and decapod crustaceans which will have a negative impact on the marine fish catch, shrimp industries and shell fish breading.

957. The witness has also pointed out that diversion of fresh water inflow is likely to alter the velocity of the flow of the river, thereby causing a change in the transportation pattern of sediments into an estuary and coast, leading to either erosion of banks/shoals or promote deposition of sediment along the banks and in the river. She has claimed that in order to maintain the fisheries biodiversity, in the present condition, the quantum of water required is 104.928 tmc during the wet season and 1.752 tmc during the dry season and that an amount of 52.464 tmc is required during the wet season whereas 0.876 tmc during the dry season is required to maintain the fisheries biodiversity in a moderate condition.

958. After giving all the relevant particulars and facts, Dr. Monteiro has concluded, in para 76 of her Affidavit-In-Evidence dated 11.11.2017 (Volume 210) that, the abstraction and diversion of water from basin will cause a change in the environmental factors, which will result in genetic fragmentation, habitat loss, loss in endemic species, recruitment failure. Change in trophic interaction thereby impacting fisheries production and in turn negativity influencing the livelihood of the fishers. This

aspect of her testimony, could hardly be challenged effectively, by the State of Karnataka.

959. This witness was cross-examined by the learned counsel for the State of Karnataka. Question Nos. 1, 10 and 15 put to the witness are relevant for this purpose and, therefore, the said questions with answers, are reproduced as under:

> "Q.No.1. According to you, as stated in your Affidavit dated 11.11.2017 (Vol. 210), at para 76, page 27, "The survival of western Ghats and the continuity of fresh water flow are essential to sustain the rich aquatic biodiversity,...". Are you referring to aquatic biodiversity in the context of Mandovi Estuary?
>
> Ans. No, not only the Mandovi Estuary, but I mean the entire Madei River System."
>
> "Q.No.10. Have you made any scientific study with regard to the contribution of each of these estuaries in Goa on the fish production, and if so, what is the percentage of contribution of Mandovi estuary in the total fish production in Goa?
>
> Ans. We do collect the fish catch data of all the estuaries in a scientific manner as per the method of Central Marine Fisheries Research Institute (CMFRI). I have given the data of the fish catch in my Affidavit dated, 11.11.2017, at para 73 at page 25. Since this

matter pertains to the Madei river and not to the other rivers, I have not produced the data of other estuaries."

"Q.No.15. Would you please refer to Volume-1 of the Master Plan of Goa (Annexure-120 of Vol.31) and turn to page No.55, para 5.6.4. The water requirement for salinity control in the estuary is mentioned as 158 Mcum (5.58 TMC). Therefore, the estimation made in the Master Plan is on the liberal side compared to what is calculated by the State of Karnataka in its Worksheet, MARK-KA/17. Therefore, you should at least accept, what is stated in the Master Plan. What do you say?

Ans. The Master Plan, Volume-I, GOA, was made in the year 1999 and therefore the figure mentioned therein does not relate to the salinity required by the aquatic bio-diversity, because perhaps at that point of time, the aquatic bio-diversity may not have been considered."

960. AW4, Shri Rajendra P. Kerkar, is examined on behalf of the State of Goa to depose as an expert witness on environment, ecology and forests. His Affidavit and Additional Affidavit are Volume 211 and Volume 216 respectively.

961. AW4, Shri Rajendra P. Kerkar, is examined on behalf of the State of Goa to depose as an expert witness on environment,

ecology and forest. He has filed Affidavit-in-Evidence dated 14.11.2017 (Volume 211) and has produced documents along with said Affidavit. Those documents form part of Volume 212. The witness has further filed Additional Affidavit-in-Evidence on 20.11.2017 (Volume 216). According to this witness, he had visited the site where construction work pertaining to the interconnecting channel at Kankumbi was done, by the Karnataka Neervari Nigam Ltd., which is designed for diverting the flow of Mahadayi River from Kalasa Nala and its tributaries to Malaprabha reservoir. According to him, he was monitoring the said work, right from the Project's Foundation Stone Laying Ceremony, which was held on 02.10.2006, till the date of his filing of Affidavit. According to him, it has come to his knowledge, through information obtained through several RTI applications, filed by him that the State of Karnataka has not obtained necessary statutory permissions and necessary clearances under Environment Protection Act, forest clearance and clearance under Wild Life Protection Act, but, has brazenly continued with, environmental degrading construction of the interconnecting channel at Kankumbi till mid June, 2017. This witness has asserted that the construction mentioned above has resulted in large scale destruction to the environment and that the State of

Karnataka had not undertaken proper environmental impact assessment study, before embarking upon the construction of such a large scale project. What is stated by the witness is that on account of the work already carried out, an extremely large forest cover area is destroyed on account of felling of trees. After asserting that he himself has gone through the pleadings, studies, submissions, applications, replies and various reports, submitted by the experts before this Tribunal, including the issues framed by the Tribunal, the witness has stressed that in case any portion of Mahadayi River flow is diverted, as planned by the State of Karnataka, by constructing a dam at Kalasa and/or reducing the inflow into Surla River, the swamps will dry. According to him, the place, where Karnataka Government has undertaken the work of Kalasa Canals in Kankumbhi, has been identified as ecological sensitive area by Western Ghats Ecology Expert Panel and that Karnataka Government violating the norms of environmental laws has undertaken the work of Kalasa Project since 2006. The witness has mentioned that out of nine rivers and their several tributaries, river Mandovi is the only one that fulfills the needs of maximum requirement of water for the State of Goa, whereas the rest of the rivers, have high level of salt water intrusion. The witness has emphasized that fresh water disputes, in the State of

Karnataka, have been caused due to fall in water level, on account of loss of forest cover, ecological degradation and faulty management of water resources. The witness has informed that if the plans of upstream diversion during Monsoon, by upper riparian States of Karnataka and Maharashtra are implemented, the total flushing time will drastically increase and the situation explained in a research paper, published by one reputed scientist of National Institute of Oceanography on the subject of Estimation of Flushing Time in Monsoonal Estuary, will really come true, which, in turn, will deteriorate the health of estuary with irreversible consequences. According to him, it is painful to notice that mankind has taken control of the water in the river and environment has been reduced to begging for some water. The witness has maintained that the term 'minimum flows' is used which is worse because it reveals a mindset of allowing 'maximum abstraction'. Ultimately, the witness has made few recommendations to maintain ecology, forests, flora and fauna etc.

962. This witness was also put question Nos. 7 and 14 on behalf of the State of Karnataka and, therefore, those questions as well as their answers are reproduced as under:

"Q.No.7. If you are given a choice between providing water to human beings and providing water to animals, how will you determine your preference?

Ans. My first priority will be for environment and I will make my best attempt to look the interest of animals first, and then if water is available, I will make attempt to provide water for human beings. If the environment is protected, then the same shall take care of human needs also."

"Q.No.14. You have specifically admitted in para 12 (page 18) of your Affidavit dated 11.11.2017 (Vol. 211) that "I have no enough expertise for verifying the intricate mathematical calculations". Therefore, I put it to you that you have neither an expertise nor competence to choose and operate a software for calculating the e-flow, and in any case the e-flow calculated by you, which comes to 36.8% of the Mean Annual Flow as stated at page 41 of your said Affidavit, is highly excessive and unreliable. What do you say?"

Ans. I deny the suggestion. Actually the Mean Annual Flow calculated by me pains me a lot. I want priority to be given for nature and environment. I have already dealt with this aspect of the matter in paras 36 and 37 of my aforesaid Affidavit, as well as earlier portion of para 12."

963. During the course of cross-examination of Shri Rajendra P. Kerkar, AW4, the expert witness on behalf of the

State of Goa on environmental issues on 23.11.2017, when confronted with the questions on minimum flows required for environment and river ecology, he replied on the basis of a publication of IWMI but conveyed his complete ignorance about the MoEF & CC guidelines. The relevant questions put to AW4, the expert witness for the State of Goa, by the Tribunal and his answers are as hereunder:

> "Q. No. 3. At Para 37, page 37 of your Affidavit dated 11.11.2017 (Vol. 211), you have mentioned about a research work done by V Smakhtin and M Anputhas, working in the International Water Management Institute (IWMI), and published as Research Report 107 'An Assessment of Environmental Flow Requirements of Indian River Basins'. It appears that findings of the above mentioned Research Report 107 are the basis for your Recommendations 2, 3, and 5 on pages 39 to 41 of your Affidavit dated 11.11.2017 (Vol. 211). Have the findings of the Research Report 107 of IWMI been critically examined and accepted by the Ministry of Environment and Forests & Climate Change?
>
> Ans. As per my knowledge and information, the findings of the Research Report 107 of IWMI has not been examined and accepted by the Ministry of Environment and Forests & Climate Change.
>
> Q. No. 4. The Section on 'Conclusions and the Way Forward' of the Research Paper 107 of IWMI, inter-alia

states as under. [Ref: Page 255 of your Affidavit dated 11.11.2017 (Vol. 212), "The study has effectively not been supplied with observed flow data of reasonable amounts and quality. The data which have been acquired and used were primarily from publicly available sources (Internet) where data are outdated and no conclusions on the accuracy or even origin of the data could be made. If the situation with access to data in India is not changed, any further EFA will be largely speculative. …"

How the results of such study can be considered as reliable and recommended to be adopted for application?

Ans. The results derived by using global flow data base and by using e-flow calculator helps to get reliable data as per my knowledge.

Q.No.5. We hand over to you the relevant pages of a document issued by the Ministry of Environment, Forest and Climate Change, in April 2015, titled as "Standard Terms of Reference (TOR) for EIA/EMP Report for Projects/Activities Requiring Environmental Clearance under EIA Notification 2006".

We find that on page 48 of "Standard Terms of Reference (TOR) for EIA/EMP Report for Projects/ Activities Requiring Environmental Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change published in April 2015, there is specific mention about environmental flow release as under:

> "- Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall be decided by the Committee based on the hydrology and available discharge.
>
> - A site specific study on minimum environmental flow should be carried out."

Why have you not considered the above mentioned guidelines included in the "Standard Terms of Reference (TOR) for EIA/EMP Report for Projects / Activities Requiring Environmental Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change?

Ans. I am not aware about the guidelines mentioned in the document, MARK-37 and, therefore, I have no comments to offer."

964. This witness was cross-examined by Shri D.M. Nargolkar, the learned counsel for the State of Maharashtra. In the said question the case of Maharashtra was put to him and, therefore, it would be interesting to reproduce Question No. 1 put to the said witness on behalf of the State of Maharashtra and answer given to the said question by the witness:

> "Q. No. 1. I put it to you that your claim, that the diversion of 2.83 TMC by the State of Maharashtra outside the Mahadayi basin, would result in irreversible damage to the environment and would destroy the rich habitat and further disrupt its ecological balance, is incorrect and without any basis. What do you say?
>
> Ans. I deny the suggestion."

965. Shri S.T. Nadkarni, AW5, in his Affidavit-in-Chief, refers to the Affidavit-in-Evidence of AW4 in relation to environmental concerns. This witness has provided the requirements of the claims of State of Goa in relation to the Wetlands. This witness was cross-examined by the Tribunal and question Nos. 8, 13, 14, 15, 16 and 17 put to him by the Tribunal are relevant for the purpose on hand. Therefore, those questions and their answers are reproduced herein below:

> "Q.No.8. At Para 23, pages 43-44 of Annexure II of your Affidavit dated 14.11.2017 (Vol. 208), you have stated as under.
>
> > "… The global warming and climate change are expected to impact the irrigation water requirement in several ways. Because of

> increased atmospheric temperature the eva transpiration will increase, and the losses by direct evaporation from water bodies, reservoirs, canal surfaces and farms will also increase. …"

We observe that you have indicated about the likely impact of global warming and climate change on irrigation water requirement. However, you have not at all mentioned about the impact of global warming and climate change on the overall water availability of Mahadayi basin.

In this regard, please answer the following.

a. What are the likely impacts of global warming and climate change on water availability of Mahadayi basin and the quantity of likely increase or decrease in the waters of Mahadayi basin, say by 2050AD?

b. What is the estimated quantity of the losses due to increase in evapo-transpiration, direct evaporation from water bodies, reservoirs, canal surfaces and farms, etc.?

Ans. I will answer this question in two parts.

a. Though there would be impact of global warming on the water availability in the Mahadayi basin, the State of Goa has not estimated the same.

b. The estimated quantity of losses in each project, due to increase in evapo-transpiration, direct evaporation

from water bodies, reservoirs, canal surfaces and farms, etc. has also not been estimated."

"Q.No.13. Has the Government of Goa carried out any scientific studies related to sea level increase and increased salinity ingress in coastal areas of Mahadayi river with due consideration of the scientifically predicted global warming? If so, what are the findings?

Ans. No such scientific study has been conducted by the Government of Goa."

"Q.No.14. Have you undertaken in-depth scientific evaluation of the issue of prioritization of various uses of water with due consideration to social, economic and environmental aspects, and particularly in the context of prioritization among in-basin uses and utilizations through extra basin diversions? If such in-depth scientific evaluation has been undertaken, what are the findings thereof?

Ans. The in-depth scientific evaluation of prioritization has not been undertaken by me but the prioritization will be followed as per the National Water Policy 2012 or any other policy in force at the relevant time."

"Q.No.15. Has the Government of Goa examined and conducted any scientific studies related to impact of reduction in flow in river Mahadayi, if any, on the process of sedimentation? If such studies have been conducted, what are the findings thereof?

Ans. The State of Goa had commissioned a Study through DHI. However, due to lack of data on sediment flow in the river, the study on sedimentation could not come to a logical conclusion."

"Q.No.16. Has the Government of Goa examined and/or undertaken scientific studies about the effect of diversion of water by States of Karnataka and Maharashtra on the agriculture of Mahadayi River Basin in the State of Goa? If such studies have been undertaken, what are the findings thereof?

Ans. No such study has been conducted by the State of Goa."

"Q.No.17. Has the State of Goa commissioned any scientific studies regarding the impact of diversion of water by States of Karnataka and Maharashtra on the ground water flow Pattern? If such studies have been commissioned, what are the findings thereof?

Ans. No such study has been conducted by the State of Goa, through any external agency. However, the Water Resources Department of the State of Goa had analyzed some of the effects at its own level."

966. Prof. A.K. Gosain, who is examined as RW1, on behalf of the State of Karnataka was put question No. 307 which is relevant for the present purpose. The said question and answer given by the witness to the same are reproduced herein below:

> "Q. No. 307. Did you while preparing 3 different Reports within a span of less than 20 months (namely your Reports dated 12th September, 2015, 15th November, 2016, and 11th May, 2017), consider or take into account, factors such as utilizable yield, dependency of the State of Goa on the water coming from the upstream of Mahadayi region, presence of thick and dense forestation, presence of 6 Wild Life Sanctuaries (the fact that the river passes through the Mahdei Wildlife Sanctuary, Bhagwan Mahavir Wildlife Sanctuary, Mollem National Park, Dr. Salim Ali Bird Sanctuary, Bondla Wildlife Sanctuary and Bhimgad Wildlife Sanctuary), requirement of maintaining the level of water in River Mandovi for navigational purposes, highly precious eco-sensitivity of the coastal estuarine system? If at all you have taken them into consideration, please show from these three Reports where, at which portion and at which page, the aforesaid factors have been reflected. Has your final yield been determined after calculating or neglecting all these factors?
>
> Ans. No. All the factors mentioned above are not required to be considered while finding out the yield of the basin."

967. As far as Shri A.K. Bajaj, RW2, examined on behalf of the State of Karnataka is concerned, this Tribunal finds following statements made by the said witness in answers to question Nos.

7 and 64 put by the learned counsel for the State of Goa as well as question No. 30 put to the said witness by the Tribunal. Those questions and answers are reproduced as under:

> "Q. No. 7. In answer to question number 2, you have agreed that any Trans boundary Impact is likely to be experienced by the States of Maharashtra and Goa, pursuant to the projects intended by the State of Karnataka. In view of this, please answer the following questions: -
>
> (a) What kind of impacts would be experienced or felt by the States neighboring, more particularly, the State of Goa, which is the lower riparian State?
>
> (b) What adverse impact will such massive eight projects proposed by the State of Karnataka have on the various projects of the State of Goa including the most essential and important drinking water projects at Ganjim and at Opa?
>
> (c) To what extent will these projects of the State of Goa stand affected?
>
> (d) Will making any kind of aberration by the State of Karnataka by virtue of their proposed eight projects, which includes trans-basin diversion, severely impact the flow and the volume of the water level in river Mahadayi flowing into Goa?

(e) Would such impact not affect the environmental flow (e flow) especially in view of the fact that the river Mahadayi passes through six wildlife sanctuaries, which include Mahadayi wildlife sanctuary right on the hottest hotspot of bio-diversity of the Western Ghats and the wildlife habitat, flora and fauna, and the densely populated pristine forest species?"

"Ans. Yes, I agree that there will be some impact on the downstream States due to the projects being taken up by the upstream State. However, the question is the quantum of such impact. I have also seen the location of the project which Government of Goa is proposing from their pleadings before this Hon'ble Tribunal. The Government of Karnataka has indicated, in their pleading before this Hon'ble Tribunal, that diversion from Mahadayi, more particularly, the Bhandura, Haltara/ Kalasa, and Kotni/ Bailnadi/ Irti Projects will be during the monsoon only. The diversion from the other projects to Kali basin are very small quantity of 0.604 tmc, 1.102 tmc and 2.613 tmc, respectively, which may or may not be taken during the monsoon only. Thus, as per the State Government of Karnataka, the withdrawal by the Government of Karnataka be only during the monsoon months, when there is plenty of water in the river, the small quantity being withdrawn will not have any major effect. The answers to the further questions are as follows:

(a) Yes, there will be limited impact of reduced flow immediately downstream of the point from where the water is proposed to be withdrawn in any stream, but there will be regeneration of water in the stream from within the stream itself and the tributaries joining the stream thereof.

(b) The eight projects of Karnataka referred in the question are by no stretch of imagination massive projects. As per the standard classification of projects of the Government of India, they would be categorized as minor projects. As I have clarified, the impact is only on the immediate downstream and that also during the non-monsoon period, when flows are low. The working of the Ganjim weir seen by me is that no water is detained at the weir in the monsoon period as the gates are kept open and there will be no impact on the Ganjim weir of the withdrawal by the Government of Karnataka. As I am not aware of the location of the Opa drinking water project, I will not be able to comment on the effect of the Karnataka projects on this project of Goa.

(c) As brought out in my Report, out of the 63 projects proposed by the State of Goa, only 8 projects, as indicated on page 17 of my Report, will be somewhat affected.

(d) As already replied, in my answer to question 7 and sub-question (a) of the present question, there will be a minor impact of the diversion by

Government of Karnataka and no severe impact can be envisaged.

(e) Many efforts have been made to define e-flows, but still there is no consensus and no values have been fixed for the same. I am not an environmental engineering expert and will not be able to say what impact there will be on the six wildlife sanctuaries in the Mahadayi basin. That can only be ascertained by carrying out an Environmental Impact Assessment study."

"Q. No. 64. In answer to the previous question, wherein you were asked about the EIA study and environmental clearance, which are a requirement mandatory in nature under a notification issued in exercise of the powers conferred by Environment Protection Act, 1986. The State Pollution Control Boards, referred to by you in your answer, based on what is mentioned in the DPR, deal with only consent to be issued under the Air Act and Water Act. The State Pollution Control Board does not deal with either the EIA or an environmental clearance. It may have been written in the DPR prepared by some officials, perhaps technically qualified, who may or may not have all the knowledge of requirements of law. But having been a CWC Chairman at some point of time, are you so naïve, and can you be so casual while answering a question that too upon oath administered to you, so as not to know the basic and elementary distinction between the role played by the Pollution Control Boards, and the grant of environmental clearance pursuant to an EIA by the Ministry of

Environment and Forests and Climate Control or its authorised bodies?

Ans. I had not been provided any EIA study about the current projects proposed to be taken up as part of diversion scheme from Mahadayi to the nearby basin. I made a reference to the clearance from Karnataka State Pollution Control Board in my answer to the previous question, as normally it is the first step taken by the State Government in the process of obtaining further clearances in this regard. I am well aware of all the legal requirements and deny the suggestion made in the question about my being unaware about the same."

Tribunal's question no. 30:

"Q. No. 30. In reply to question No. 64, put to you by the Learned Senior Counsel of the State of Goa on 13.9.2017, you have, inter-alia, stated as under.
"I had not been provided any EIA study about the current projects proposed to be taken up as part of diversion scheme from Mahadayi to the nearby basin. …"

In continuation to your reply to question No. 64, you also stated, "I am well aware of all the legal requirements and deny the suggestion made in the question about my being unaware about the same". Since you are fully aware of the requirements, it is expected from you that you should have insisted for EIA studies and in the event of possible delay in completion of EIA studies, you could have made

appropriate assumptions in respect of environmental impacts and needed measures for addressing such impacts, on the basis of secondary information before undertaking the hydrological studies and water balance studies.

In this regard, please answer the following:

a. What efforts were made by you to get the requisite information with regard to EIA from secondary sources?

b. If EIA study had been supplied, would it have impacted your conclusions relating to your hydrological and water balance studies? If yes, to what extent? If no, give reasons therefor.

Ans. My answers to paras (a) and (b) are as follows:-

a. As the site specific EIA studies for the project had not been got conducted by the project engineers, which would have given the required information for making provisions in my study, I was unable to get this information from any secondary sources. EIA studies normally are for the purpose of the project concerned and cannot be applied in general.

b. If the EIA study for the diversion project of Government of Karnataka had been carried out and indicated some quantum of minimum flows to be set aside, I would have taken this into consideration while carrying out my Study. Since

> the study has not been carried out it is not possible to give any figure regarding the extent of impact."
>
> [Emphasis supplied]

From above, it is apparent that the State of Karnataka has not undertaken the requisite EIA study in respect of diversion of water of Mahadayi river through Kalasa-Bhandura scheme. The witnesses appearing on behalf of the State of Karnataka have also not reported any study related to impact of such diversion. However, the Tribunal finds at para 5.24, page 51 of the "Reply on behalf of the State of Karnataka (as Amended Pursuant to the Order Dated 15.04.2015 Passed by the Hon'ble Tribunal) to the Amended Statement of Case of Goa Dated 23.04.2015" (Volume 138), the State of Karnataka has stated as under.

> "… Karnataka submits that after the construction of Kalasa dam as per Kalasa DPR 2010, about 0.15 tmc of water would be maintained as downstream flows during the non-monsoon months from December-May at the rate of 10 cusecs per day. At present there are no flows in the river (pre-construction flows) during the months of January to May as measured by Karnataka Kalasa, inter-connecting canal for the water years 1991-92 to 1997-98. The flow tables of the Gauge reading records and yield calculations for Kalasa Nala, Haltara Nala and Surla Nala are hereto marked and annexed as Annexure R4 at pages 85 to 89.

> Therefore, the proposal of Karnataka to maintain 10 cusecs per day which equals to 0.15 tmc at the border during the non-monsoon months would take care of and promote ecology."

968. The contention raised on behalf of the State of Karnataka to the effect that the proposal of Karnataka to maintain 10 cusecs per day which equals to 0.15 TMC, at the border, during the non-monsoon months would take care of and promote ecology, is not based on any scientific study and has no substance at all and cannot be accepted. This is more so in view of the Para 3.3 of the National water Policy 2012 which states as under.

> "3.3 Ecological needs of the river should be determined, through scientific study, recognizing that the natural river flows are characterized by low or no flows, small floods (freshets), large floods, etc., and should accommodate developmental needs. A portion of river flows should be kept aside to meet ecological needs ensuring that the low and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use."

In this regard it would be necessary for the Tribunal to emphasis certain other clauses of National Water Policy, 2012, which are as under:

Sub-clause (iv) of clause 1.2 says:

"(iv) Climate change may also increase the sea levels. This may lead to salinity intrusion in ground water aquifers / surface waters and increased coastal inundation in coastal regions, adversely impacting habitations, agriculture and industry in such regions."

Whereas, Sub-clause (vii) of the said clause reads as under:

"(vii) Water resources projects, though multi-disciplinary with multiple stakeholders, are being planned and implemented in a fragmented manner without giving due consideration to optimum utilization, environment sustainability and holistic benefit to the people."

Sub-clause 5.5 of the said Policy makes following mention:

"5.5 Inter-basin transfers are not merely for increasing production but also for meeting basic human need and achieving equity and social justice. Inter-basin transfers of water should be considered on the basis of merits of each case after evaluating the environmental, economic and social impacts of such transfers."

969. While explaining the concept of sustainable development, Shri Shyam Divan, the learned Senior Counsel on

behalf of the State of Karnataka has relied upon India's National Environment Policy, 2006, which reads as under:-

> "Economic growth, in its turn, bears a dichotomous relationship to environmental degradation. On the one hand, growth may result in "excessive" environmental degradation through use of natural resources and generation of pollution aggravated by institutional failures. If impacts on the environmental resource base are neglected, an incorrect picture is obtained from conventional monetary estimates of national income. On the other hand, economic growth permits improvement in environmental quality by making available the necessary resources for environmental investments, and generating societal pressures for improved environmental behaviour, and institutional and policy change.
>
> The following Principles, may accordingly, guide the activities of different actors in relation to this policy. Each of these Principles has an established genealogy in policy pronouncements, jurisprudence, international environmental law, or international State practice:
>
> > i. Human Beings are at the Centre of Sustainable Development concerns:
> > Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

ii. The Right to Development:
The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

iii. Environmental Protection is an Integral part of the Development Process:
In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it"

970. However, this Tribunal is of the opinion that the pertinent observations, made by the Krishna Water Disputes Tribunal in its Report, Volume IV, at page 729, must be borne in mind and they are:

"Even the National Water Policy of 2002 suggests priority to the maintenance of ecology recognizing the importance of the water allocation on ecology.

The examples of environmental flows requirement were indicated to be flows to maintain the physical habitat flows, to maintain suitable water quality flows, to allow passage for migratory fish, flows to maintaining soil moisture levels, flows to maintain soil/fresh water balance, flows to recharge the aquifers, flows that maintain biodiversity and ecosystem etc."

971. It is worth emphasizing that the environmental and ecological aspects which have to be addressed by the project authorities, in the project reports have been outlined by the Ministry of Environment and Forests (renamed now as Ministry of Environment and Forests & Climate Change). The said Ministry has also issued guidelines/checklist for submitting application for clearance of projects for environmental and forests angles. The record does not indicate that before digging and constructing deep cut canal, the State of Karnataka had followed guidelines issued by the abovementioned Ministry.

972. Further, as per then Planning Commission letter no. 16(2)99-WR dated 30.11.2000, the concerned State Government or the project authorities are required to obtain necessary clearance from the Ministry of Environment and Forests and the Ministry of Social Justice and Empowerment before investment clearance. Here also, the Tribunal finds that, no such forest clearance, has been obtained by the State of Karnataka, which would have ensured protection to ecology, forest etc.

973. The Tribunal finds that what is important to notice is that, it is required that the project authorities would undertake a Comprehensive Environmental Impact Assessment (CEIA) study as a part of the Detailed Project Reports, to find out if there is any adverse impact on flora, fauna, wildlife, fishing, agricultural activities, aquatic eco-system, etc. in the vicinity of the project. If so, adequate mitigation measures would be suggested to minimize such impacts. The cost of mitigation measures is then covered in the overall project cost estimates under 'Environment, Ecology and Forests aspects'.

974. It may also be pointed out that the Environmental Impact Assessment (EIA) Notification of 2006 is issued by the Ministry of Environment and Forests, New Delhi dated 14.09.2006 in exercise of powers conferred under sub-section (1) and clause (v) of Sub-section (2) of Section 3 of the Environment (Protection) Act, 1986, wherein the Central Government is empowered to direct the State Governments, that on and from the date of its publication, the required construction of new projects or activities, listed in the Schedule to the notification, shall be undertaken in any part of the India, only after the prior environmental clearance (EC) from the Central Government or as

the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of Section 3 of the said Act, in accordance with the procedure specified hereinafter in this notification.

975. The relevant paragraphs of the said notification read as under:

> "4. Categorization of Projects and activities:
>
> (i) All projects and activities are broadly categorized in to two categories –Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and manmade resources.
>
> (ii) All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification;

(iii) All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions (GC) stipulated in the Schedule, will require prior environmental clearance from the State/ Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In the absence of a duly constituted SEIAA or SEAC, a category 'B' project shall be treated as a Category 'A' project.

In the "Schedule - List of Projects or Activities requiring prior environmental clearance", the River Valley Projects are mentioned at Sl. No.1(c) wherein the projects covering (i) > 50 MW hydroelectric power generation; (ii) >10,000 ha of Culturable command area are categorized in category "A" and the projects covering (i) < 50 MW >25 MW hydroelectric power generation; (ii) < 10,000 ha of Culturable command area in category "B", subject to the General Condition as stated below:

General Condition (GC)

Any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii)

Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive area, (iv) inter-State boundaries and international boundaries.

5. Screening, Scoping and Appraisal Committees

The Experts Appraisal Committees (EACs) at the Central Government and SEACs at the State or the union Territory level shall screen, scope and appraise projects or activities in Category A and Category B respectively. EAC and SEACs shall meet at least once every month.

6. Application for Prior Environmental Clearance (EC)

An application seeking prior environmental clearance in all cases shall be made in the prescribed Form 1 annexed herewith and Supplementary Form 1A, if applicable, as given in Appendix II, after the identification of prospective site(s) for the project and/or activities to which the application relates, before commencing any construction activity, or preparation of land, at the site by the applicant. The applicant shall furnish, along with the application, a copy of the pre-feasibility project report except that, in case of construction projects or activities (item 8 of the Schedule) in addition to Form 1 and the Supplementary Form 1A, a copy of the conceptual plan shall be provided, instead of the pre-feasibility report.
…

9. Validity of Environmental Clearance (EC)

> The 'Validity of Environmental Clearance' is meant the period from which a prior environmental clearance is granted by the regulatory authority, or may be presumed by the applicant to have been granted under sub paragraph (iv) of paragraph 7 above, to the start of production operations by the project or activity, or completion of all construction operations in case of construction projects (item 8 of the Schedule), to which the applicant for prior environmental clearance refers. The prior environmental clearance granted for a project or activity shall be valid for a period of ten years in the case of River Valley Projects."

976. Having regard to the above stated salutary principles, the evidence on record will have to be appreciated to answer the issues mentioned above. Shri Chetan Pandit in his testimony has laid the foundation for establishing the importance of environmental flow. The testimony of Shri Paresh Porob, AW2, fairly establishes that the wild life habitats in the Madei Wildlife Sanctuary depends upon the water from Mahadayi River because most of the other streams go dry after the monsoon and wild life habitats of Madei Wildlife Sanctuary entirely depends on Surla and Mahadayi rivers. Further, his evidence shows that environmental stability is most important for having eco-centric approach towards conservation and not anthropo-centric. What is established by the witness is the fact that the eco-centric

approach includes ecosystems flora and fauna and humans, whereas in anthropo-centric approach, humans are given priority above flora and fauna, which can have devastating effect on environment. He has further proved that for the views expressed by him in his testimony, he has relied upon the National Forest Policy of 1988 as well as National Biodiversity Action Plan, 2008 promoted by Government of India. His testimony would show that derivation of direct economic benefit should be insubordinate to the principal aim which is to maintain environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms including Humans. This witness has in terms established that if proposed project for diversion of Madei River waters is allowed, it will be harmful to the ecology and will also adversely affect the wild life sanctuaries and would defeat the principal aim of the National Forest Policy, 1988. The witness has reasonably proved that the Government of Goa has notified various wild life sanctuaries along the stretch of Western Ghats of Goa for water security and maintaining ecological balances.

977. As far as the testimony of AW3, Dr. Shamila Monteiro, is concerned, the Tribunal finds that her testimony also

reasonably makes out a case that diversion of water would adversely affect the mangroves as well as breeding and sustenance of several kinds of marine fishes, number of which may not be less than 290 species. Her testimony further makes out that the aquatic ecosystem is highly complex, fragile, sensitive and specialized ecosystem that needs protection and that any diversion of water outside basin of the river Mahadayi will have a major repercussion on the ecosystem, consequently destroying the ecological equilibrium of the associated ecosystems. Her testimony undoubtedly proves that impact of large scale hydrological alteration will manifest as habitat fragmentation/loss caused by altered flows leading to loss of flood plains, riparian zones and adjacent wetlands, deterioration of estuaries, deterioration of irrigated terrestrial environments and associated surface waters. Her testimony also establishes that due to diversion of water, water quality will be reduced due to insufficient dilution of point and non-point sources of pollution and that any abstraction of water and diverting it into another basin will reduce the downstream flow, thereby causing a decrease in recharge of ground water. What is noticeable in her testimony is that perturbations will cause a change in the natural flow regime of the river and its tributaries resulting in reduced

flow of water leading to fragmentation of minor rivers, streams and other water bodies, which will have a profound effect in availability of fresh water and would affect forests dependent species.

978. The testimony of Shri Rajendra P. Kerkar, AW4, who has deposed as an expert witness on environment, ecology and forests, establishes that the State of Karnataka has not obtained any necessary statutory permissions and clearances under Environmental Protection Act, Forest Act and Wild Life Protection Act, but has brazenly continued with the environmental degrading construction of the interconnecting channel at Kankumbi till mid-June, 2017 and that this construction has resulted in large scale destruction to the environment. His testimony would also show that no proper environmental impact assessment study was undertaken by the State of Karnataka before embarking upon the construction of such a large scale project and on account of the work already carried out, an extremely large forest cover area is destroyed on account of felling of trees, whereas on account of excavation work and other works carried out by the State of Karnataka mangroves myristica swamp forest etc. have been adversely affected.

979. The Tribunal notices that, Shri S.T. Nadkarni, AW5, has mentioned in his testimony that global warming and climate change assessment is likely to impact the irrigation water requirement in several ways and because of increased atmospheric temperature, evapo-transpiration will increase and the losses by direct evaporation from water bodies, reservoirs, canal surface and farms will also increase. However, in answer to Question No. 8, the witness has candidly admitted that though there would be impact of global warming on the water availability in the Mahadayi Basin, the State of Goa has not estimated the same. Further, in answer to Question No. 13, the witness has admitted that the Government of Goa has not carried out any scientific studies relating to sea level increase and increased salinity ingress in coastal area of Mahadayi River with due consideration of the scientifically predicted global warming.

980. In answer to Question No. 16, the witness has mentioned that the government of Goa has not examined and/or undertaken scientific studies about the effect of diversion of water by States of Karnataka and Maharashtra, on the

agriculture of Mahadayi River Basin in the State of Goa, whereas in answer to Question No. 17, the witness has stated that the State of Goa has not commissioned any scientific studies regarding the impact of diversion of water by the States of Karnataka and Maharashtra, on the ground water flow pattern.

981. As observed earlier, Shri A.K. Gosain, RW1, while answering Question No. 307, has given a totally vague reply and it would be safe to conclude from his answer that he had not considered or taken into account the factors, such as, utilizable yield, dependency of the State of Goa on the water coming from upstream of Mahadayi region, presence of thick and dense forestation, the fact that the river passes through Mahdei Wild Life Sanctuary, Bhagwan Mahavir Wildlife Sanctuary, Mollem National Park, Dr. Salim Ali Bird Sanctuary, Bondla Wildlife Sanctuary and Bhimgad Wildlife Sanctuary, requirement of maintaining the level of water in River Mandovi for navigational purposes, highly precious eco-sensitivity of the coastal estuarine system, in any of his three Reports.

982. However, the most important testimony to be noticed is that of RW2, Shri A.K. Bajaj. His reply to Question No. 7

indicates that he has agreed to the fact that there will be some impact on the downstream States due to the projects being taken up by the upstream States.

983. In answer to Question No. 7(a), the witness has admitted that there will be limited impact of reduced flow immediately downstream of the point from where the water is proposed to be withdrawn in any stream.

984. Further, he has admitted in answer to Question No. 30 put to him by the Tribunal, that site specific EIA studies for the project were not got conducted by the project engineers and that EIA studies normally are for the purpose of the project concerned and cannot be applied in general.

985. On overall view of the assessment of evidence led by the parties relating to Issues Nos. 5, 11, 16, 18, 19, 21, 22, 23, 30 and 32, this Tribunal is of the firm view that it has been proved by the State of Goa that after assessing and deducting from the available waters of river Mahadayi, required for ecological sustenance of the river valley eternally and specifically giving due consideration to the scientifically predicted global warming sea

level increase, increased salinity ingress in coastal areas etc., the share of all the riparian states should be determined. The Tribunal finds that the State of Goa has established that after taking into consideration the long term, in basin needs of the three states for the purpose of domestic water supplies, irrigation, hydropower generation, navigation, pisciculture and environmental projects, equitable share of three co-basin States should be adjudicated. The Tribunal opines that the State of Goa has proved that the proposed diversion schemes of the State of Karnataka and Maharashtra will cause severe and irreparable damage and losses to the forests, wild life, other organic life and biodiversity stratosphere of the area in Mahadayi basin, particularly in the upstream areas and also to overall ecology of the Mehdai River Basin. As found earlier, it is even the case of State of Maharashtra that any sort of diversion or utilization by any of the States, including the State of Goa, in future, in Mahadayi Basin, would result in adverse impact and would disturb the ecological balance, resulting in total disaster in Mahadayi basin. This is evident if one refers to question No. 6 put by the learned counsel for the State of Maharashtra to witness Shri Paresh Porob, AW2. Thus, the claim of the State of Goa that diversions or utilizations by the State of Karnataka and by the

State of Maharashtra, of water of river Mahadayi would result in adverse impact and would disturb the ecological balance, resulting in total disaster in Mahadayi basin, gets support and full corroboration from the State of Maharashtra. The Tribunal holds that it is further proved by the State of Goa that the proposed diversion schemes of the State of Karnataka and State of Maharashtra would severely result in destruction, exploitation, damage, diversion of habitats from the wild life sanctuary and also diversion of water into and/or outside the wild life sanctuary etc. It is further proved by the State of Goa that diversion of any kind by the State of Karnataka and the State of Maharashtra of Inter-State Water of River Mahadayi will degrade and impact the ground water flow etc. However, the Tribunal notices that, as admitted by Shri S.T. Nadkarni AW5, the Goa has not estimated as to what would be the impact of global warming on the water availability in the Mahadayi basin nor the Government of Goa has carried out any scientific studies relating to sea level increase and increased salinity ingress in coastal area of Mahadayi River with due consideration of the scientifically predicted global warming nor any in-depth scientific evaluation on prioritization has been undertaken by the State of Goa with due consideration to social, economic and environmental aspects. Further, his study in no

uncertain terms makes it clear that the Government of Goa has not examined and conducted any scientific studies relating to impact on reduction in flow in the river Mahadayi, if any, on the process of sedimentation nor the Government of Goa has examined and/or undertaken scientific studies about the effect of diversion of water by State of Karnataka and State of Maharashtra, on the agriculture of Mahadayi River Basin in the State of Goa. Further, his evidence also indicates that the State of Goa has not commissioned any scientific studies regarding the impact of diversion of water by the State of Karnataka and the State of Maharashtra, on the ground of water flow pattern.

986. In the absence of data relating to estimation of quantity of water, which would adversely affect ecology, environment, salinity ingress, fisheries, wild life, flora and fauna etc., the Tribunal is not in a position to come to a definite conclusion as to what extent the above said matters would be adversely affected or what would be the percentage of such adverse effects. If such data with facts and figures had been placed by the State of Goa before the Tribunal, it would have helped the Tribunal in recording a concrete finding and in absence of such data it is difficult to conclude for the Tribunal as

to what particular percentage wild life, ecology, environment, salinity ingress, fisheries, flora and fauna would be affected.

987. However, the Tribunal notices that the State of Karnataka and the State of Maharashtra, are seeking diversion of water, from inter-State Mahadayi river. Therefore, those States are, hereby, directed to carry out detailed study to assess impacts, of diversion of water from Mahadayi river, on wild life, flora and fauna, fishing, agriculture activities, aquatic eco-system, process of sedimentation, ground water flow patter, ecology, flow of water into the inter-State river etc., before seeking prior environmental clearance, as stipulated in Environmental Impact Assessment Notification of 2006.

988. In the light of above discussion, Issues Nos. 5, 11, 16, 18, 19, 21, 22, 23, 30 and 32 stand accordingly answered.

NAVIGATION

989. The aspects related to navigation are included under Issue Nos. 3, 20 and 50, which are reproduced hereunder.

> "3. Whether it is proved by the State of Goa that Zuari basin is inter-connected with Mahadayi basin through Cumbarjua Canal, which runs in a north-south direction and any diversion of waters from river Mahadayi would affect the navigational channel?"
>
> "20. Whether the State of Goa establishes that the proposed diversion by the States of Karnataka and Maharashtra would have severe and irreparable impact and damage on the navigation in the river Mahadayi which in turn would also impact financial, tourism and economic growth of the State of Goa and the nation?"
>
> "50. Whether the State of Karnataka proves that navigable part of Mahadayi River in Goa is limited and in any case, such navigation is only during monsoon season?"

990. These are the issues concerned with Mahadayi Inter-State river waters, and the impact of the proposed attempts of the State of Karnataka and the State of Maharashtra of diversion

of such waters on navigation in particular. Since these issues are closely related to one another, they are being dealt with together. Before taking up further discussion on these issues, it would be appropriate to have a glance at the pleadings of the contestant States in this regard.

991. The claimant State of Goa pleaded in the Amended Statement of Claims (Volume 131) at paras 14A, 18D(i), 18D(ii), 18F, 24A, 24B, 24C, 24D, 24E, 24F, 24G, 25, 25A, 25B, 25C, 25D, 25E, 154C, 168, 190C(ii), 191, 195, 221 and 224A as under:

> "14A. The State of Goa states that at the time of submission of information/data/documents to the Agency appointed by the State of Goa for the preparation of the sedimentation/ bio diversity studies, the State of Goa undertook the process of digitization of river maps/plan relating to length of River Mhadei within the State of Goa. The State of Goa states that while conducting the said exercise, it was noticed that the length of River Mhadei within the State of Goa is 76 kms as against the originally estimated length of 52 kms. It may be noted that the length of the said River within the State of Karnataka is 35 kms. The total length of River Mhadei is therefore 111 kms. The State of Goa further states that as a result of the digitization of maps / plans, it is revealed that the length of the River upto which the salinity ingress impact is felt (i.e. upto Ganjem discharge measuring site) is 46 kms. from the mouth of

the river as against the originally estimated length of 36 kms. There is a long established navigational networking the Mhadei River in the last reach of 46 kms. The State of Goa states and submits that references to the length of River Mhadei as given at paras 18,18A,23,25, and 165 of the amended statement of case filed by State of Goa may be read in the light of the clarification stated above."

"18D(i). 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. …"

"18D(ii). As a matter of fact, State of Goa 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 craves leave to refer to and rely upon copy of the said study report once the same is completed."

"18F. In light of the aforesaid submissions it can be summarised 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. These environmental and morphological needs require maintaining an adequate flow in the river."

"24A. The State of Goa states and submits that the State of Goa has about 555 Kms. of inland water ways, out of which about 255 Kms. are navigable through rivers Mhadei and Zuari including through the Cumbharjua canal and their respective tributaries. The State of Goa further states and submits 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 Mormugao 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. These channels are in existence since times immemorial. 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....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. 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 which will be severely affected. ...”

“24B. The State of Goa states and submits that in the matter of any kind of abstraction including any kind of trans basin or inter basin diversion of Mahadayi river by the State of Karnataka and State of Maharashtra is a matter of aggravating concern for the State of Goa. The State of Goa states and submits that 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 pertinent to note that the present available depth within the navigational passage in the Mhadei River is 3.00 mts. over all. The movement of the vessels having the draught of 3.3 mts. is regulated to ply during the high water period only. 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 pertinent to note 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 and submits that the revenues directly earned by the State

of Goa 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. …"

"24C. The State of Goa states and submits 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. 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."

"24D. The State of Goa states and submits that 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. In furtherance of keeping up with the progress in the tourism industry, the State of Goa has continuously endeavoured 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 states and submits that as a result of such promoting of tourism related activities, the tourism potential in the interior parts of the State have been booming. The immediate effect of such booming has resulted in large scale tourism related activities being

carried out on these inland water ways. The State of Goa states and submits that a large number of tourists visit such area 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. These inland water ways form the backbone of such tourism related activity and 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."

"24E. At any rate, it may be noted that the 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 river and Zuari river through the Cumbharjua canal. The State of Goa states and 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 Cumbharjua canal. 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."

"24F. The State of Goa further states and submits that 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 flushing out the sediments in addition to the dredging carried out by the State of Goa. 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 states and submits that even regular maintenance dredging will not be 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."

"24G.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 effect on the economy of the State and Nation as well as the local residents."

"25. Mandovi is navigable in Goa territory in its last 35 Km of length. Total length of the Mandovi from the source to the sea is 87 Km. the initial 35 Km. of the river is in Karnataka and the remaining 52 Km. in Goa state. There is a long established navigation in the Mandovi River in the last reach of 35 Km. carrying passenger and

goods and specially the iron ore. There is a long established fishing occupation also in this reach of the river. Tourism and fishing, iron ore industries, and Agro Chemical industries depend on the available Mandovi waters. On the Dudhsagar/Khandepar, thereisthe existing Opa headworks which meets the domestic and the industrial water supply needs of Tiswadi (Panaji) and Ponda Talukas."

"25A. The proposed diversion by the State of Karnataka would also have severe and irreparable impact and damage on the navigation in the River Mhadei. It is pertinent to note that mining and export of mineral ore and tourism are the backbone of Goan economy and also make substantial contribution to the national GDP. The MormugaoPort serves as an outlet for export of iron ore. The iron ore stocks are brought to the MormugaoPort through barges, which ply on the Mandovi and Zuari rivers. The MormugaoPort, which is situated in Zuari basin, is connected to the Mhadei basin (Mandovi River) through a natural channel known as 'Cumbharjua channel'. It is submitted that the Aguada bay of Mhadei River and the Cortalim bay of Zuari River culminates into and forms Mormugao bay, where the MormugaoHarbour 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. There are 30 river loading jetties along the Mandovi River. It is submitted that at present, around 600 barges transit through this channel.

"25B. It is pertinent to note that Cumbharjua Channel is a natural channel having a length of about 17 kms. 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 Cumbharjua Channel is possible at present since a draft (water depth) of 2.60 mts. or thereabouts is available. However, the proposed diversion of water of River Mhadei will affect the existing draft of the river/Cumbharjua channel and hamper smooth and safe navigation in the region."

"25C. It is an acknowledged fact that every navigational channel runs the risk of sediment deposition in its channel and the sediments entering the channel needs to be flushed out by force of flowing water. It is a further known fact that such sediments may enter the river not only from the upstream catchment but also from the sea side. Flushing of sediments requires not only a particular depth of water but also certain amount of velocity or water flow. It is submitted that even in the present situation, there is a severe problem of sediment deposition noticed between Diwar and Chorao islands. It is submitted that 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 Cumbharjua Channel."

25D. It is further pertinent to note that flow of water from Mandovi through the Cumbharjua channel and then to Zuari and Mormugao Port helps flushing of

sediments in the navigational reach comprising of Cumbharjua, Zuari and Mormugao Port. The contention raised by the State of Karnataka at para 4(36) of its rejoinder dated 15.07.2013 to the effect that the Cumbharjua channel is an artificial interconnection and that no water from Mandovi River flows down to Zuari River through the Cumbharjua channel is emphatically denied.

25E. 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 ore laden barges and other tourism related cruise liners in the Mandovi River and more particularly in the Cumbharjua Channel.

"154C. It is further submitted 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 submitted 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 further pertinent to note that the

Bandura dam proposed site 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 effect the flora and fauna in that Area."

"168. 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 Mormugao Port for export. The depth of estuary varies from 8-10m at the mouth to less than 2m."

"190C (ii).Reference is required to be made to the Judgment of the Hon'ble Supreme Court of California in the case of "National Audubon Society V/s. The Superior Court of Alpine Country dated 17/2/1983". This was a case concerning diversion of Mono Lake water by the State which had devastating effect on the nature as well as the Lake. In this case, Doctrine of Public Trust was invoked.

……

(b) The Court explained the purpose of the public trust as under:-

> *"The objective of the public trust has evolved in tandem with the changing public perception of the values and uses of waterways. As we observed in Marks v. Whitney, [public trust easements (were) traditionally defined in terms*

of navigation, commerce and fisheries. They have been held to include the right to fish, hunt, bathe, swim, to use for boating and general recreation purposes the navigable water of the State, and to use the bottom of the navigable waters for anchoring, standing or other purposes. We went on, however, to hold that the traditional triad of uses – navigation, commerce and fishing – did not limit the public interest in the trust res. In language of special importance to the present setting, we stated that the public uses to which tidelands are subject are sufficiently flexible to encompass changing public needs. In administering the trust the State is not burdened with an outmoded classification favouring one mode of utilization over another. There is a growing public recognition that one of the important public uses of the tidelands – a use accompanied within the tidelands trust – is the preservation of those lands in their natural state, so that they may serve as ecological units for scientific study, as open space, and as environments which provide food and habitat for birds and marine life, and which favourably affect the scenery and climate of the area'."

"191. 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.

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 harbour. 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."

"195. It is submitted that in the present case, the question involved is not merely that for an "Interstate basin transfer within the States of Karnataka and Maharashtra…..The navigation and transportation through Mahadayi River, which is virtually the lifelines of the economy stand at serious peril. Highly eco-sensitive regions, including the Khazans, Puran Xeti, etc. shall be rendered extremely vulnerable. 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…"

"221. The existing uses require protection. The Mahadayi River or Mahadayi River Basin in the State of Goa is being used for the purpose of navigation and transportation. The major towns have come up over the edges on the Banks of River Mahadayi and on the Mahadayi River Basin. This entire area is the riddle for

culture and heritage. Several important Temples, Churches and other places of worships are in this region. This region has seen flourish of the traditional, agricultural and cultivator practices. The entire heritage and culture of the region is very intricately connected to the Mahadayi River or Mahadayi River Basin. The existing uses will have to be brought at a grinding halt in case there is any alteration in the profile of Mahadayi River and diversion of waters from its Basin."

"224A. It is respectfully submitted that the state of Goa, 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 Mormugao 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."

992. AW-1, Shri Chetan Pandit, in his Affidavit-in-Chief (Volume 191) has stated that sometime in later half of 2014, the State of Goa undertook the process of digitization of river maps/plan relating to length of River Mahadayi within the State of Goa. AW1 has also stated that when the length of the River is

measured by a software using digitized maps, it has turned out that the length of river Mahadayi within the State of Goa is 76 kms as against the originally estimated length of 52 kms and the length of the said River within the State of Karnataka is 35 kms. According to the said witness, the total length is therefore 111 kms. It is further stated by him 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. the weir near the Ganjim discharge measuring site) is 46 kms. from the mouth of the river as against the originally estimated length of 36 kms and thus, there is a long established navigational networking in Mahadayi river in its last reach of 46 kms.

993. Questions No. 1 and 15 by this Tribunal to AW-5, Shri S. T. Nadkarni and the replies of the witness are relevant for the present purpose and the said questions and answers are as hereunder:

> "Q.No.1. At Para 28, page 13 of your Affidavit dated 4.11.2017 (Volume 208), you have stated as under:
>
> > "28. Hence inland waterways being a way of life and lifeline of Goa, diversion or abstraction by the State of Karnataka of any water will severely affect the navigational traffic."

In this regard, please answer the following.

a. Has any scientific study been undertaken and / or completed by the Government of Goa to examine the impact of diversion of water outside the basin and / or abstraction of water within the basin by co-basin States, including the State of Goa, for meeting the demand of water for various purposes (such as, drinking water, irrigation, power generation, industrial needs, etc.) on navigation?
b. Is there any study which indicates the impact of diversion / abstraction of water for various purposes on navigation in quantitative terms?

Ans. Before submitting the Statement of Claim and the Amended Statements of Claim, I had read each sentence and paragraphs of the said Statement of Claim and Amended Statements of Claim, respectively, and I reiterate and standby each sentence and paragraph in the said Statements. The said Statements/ Pleadings may be considered as my evidence on oath.

The State of Goa made attempts to examine the impact of diversion/ abstraction of water outside the basin by all the States on navigation. However, due to absence of data on sedimentation, as Ganjim G&D site did not measure any such data, inferences could not be drawn from the studies, especially as regards to navigation. However, there would be definitely some effect if water is diverted to outside the basin, as utilization in the basin itself will result in return flows in the river."

> "Q.No.15. Has the Government of Goa examined and conducted any scientific studies related to impact of reduction in flow in river Mahadayi, if any, on the process of sedimentation? If such studies have been conducted, what are the findings thereof?
>
> Ans. The State of Goa had commissioned a Study through DHI. However, due to lack of data on sediment flow in the river, the study on sedimentation could not come to a logical conclusion."

The respective stands taken by the other States are as under.

994. The State of Karnataka in the Amended Statement of Claim dated 15.04.2015 in I.A. 46 of 2015, the NEERI Report had been quoted in extenso and certain portions thereof deal with navigational activities as well. The relevant portion of the NEERI Report is as under:

> "2.12 The NEERI report, *inter alia,* concluded as follows:
>
> …
>
> 16. Due to the post project change in the flow regime of the Mahadayi/Mandovi, no significant impact on the phenomenon of sand bar formation at the mouth of the river, the associated navigational activities and the beach ecosystem of Goa is anticipated."

Relating to the requirement of maintaining the level of water in river Mahadayi for navigational purposes and other purposes as well, RW1, Prof. A. K. Gosain, was cross-examined and question No. 307 in this regard whether his final yield had been determined after calculating or neglecting all these factors narrated in detail in the question, the answer was "No. All the factors mentioned above are not required to be considered while finding out the yield of the basin."

995. The relevant question (No.8) and answer thereto of RW2, Shri A.K. Bajaj, are as hereunder:

> "Q.No.8. In your affidavit you have mentioned at paragraph 3, at page 3 thereof, that you have gone through the complaints, amended statement of Claims and submissions and other relevant documents filed before the Hon'ble Tribunal by the three States of Goa, Karnataka and Maharashtra, besides other related technical reports and available data. In the statement of claim, filed by the State of Goa, there is a specific reference to the drinking water project of the State of Goa, namely, Opa Water Works. This project has been in existence since the pre-liberation times, commenced somewhere in the year 1955. In answer to the interrogatories, filed by the State of Goa, to the

interrogatories administered by the State of Karnataka (Vol.103), at page 13 thereof, in Annexure-5-1, there is a specific reference to the monthly and annual draws of drinking water from Opa. Yet, in your answer to the preceding question, you have stated that you are not aware as to where this project is located. Besides Opa project, there are number of other irrigation, as also other requirements of water of the State of Goa most of which are existing requirements have been mentioned in the Statement of Claims. Indeed, Opa finds reference in paragraphs 20, 25, 159, 159A, 159B. Further, Goa's requirement for drinking water purposes, industrial use, maintenance of appropriate river morphology as also requirement of water for inland navigation have been mentioned. Further, in the Statement of Claim, it has been clearly mentioned that the 94 TMC under the Master Plan are projected requirements, but in addition there are present use requirements of water all of which have been mentioned from paragraph 18C onwards.

In your Report, you have made a reference only to the 63 projects under the DPR, leaving out the very many water requirements in presenti, specifically pleaded by the State of Goa.

Can you please show from your Report any consideration, whatsoever, as regards impact or any reference to the existing water requirements of the State of Goa, specifically pleaded in the Statement of Claim, which you claim to have considered in paragraph 3 of your affidavit? If not, why were these important requirements of the State of Goa ignored? Does not this blissful ignorance of yours show and display to

prepare a convenient report, heavily loaded in favour of Karnataka, in your unabated enthusiasm?

Ans. In paragraph 10 of my Report, on page 16, I have specifically dealt with the claim of the State of Goa which, as mentioned in the question itself, is 94.4 TMC. The total demand for the existing drinking water projects is comparatively much lower. This is a standard requirement projection as, in many multiple use projects or basin, the major water consumption to the extent of 70 – 75% is for irrigation. The figures in para 10 of the Report also illustrate this as, the projected requirement is 2050 Mcum for irrigation as against only 208 Mcum for drinking water. These figures have been taken from the Government of Goa's Statement of Claim and amended Statement of Claim.

Further, the so-called DPRs for the 63 projects submitted by the State of Goa indicate a total requirements of only 38.53 TMC as against the claim of 94.4 TMC projected earlier before the detailed reports were submitted. As such, there is adequate quantity of water available to meet the other alleged requirements for fisheries, navigation, forest conservation, etc. as mentioned in the present question. Also, I have brought out that the effect of drawal of water by Government of Karnataka will not have much effect a few kilometres downstream of the point of the drawal.

(PER TRIBUNAL: On a specific query put by the Tribunal as to<u>whether the above said explanation with regard to the other requirements of the State of Goa, such as,</u>

> fisheries, navigation, forest conservation, etc. and also the requirement of the State of Goa, which has been put in the Statement of Claim as requirement for drinking water purposes, industrial use, maintenance of appropriate river morphology as also requirement of water for inland navigation have been mentioned, the witness candidly admits that no mention thereof has been made of the aforesaid requirements of the State of Goa in his Report, Exh.KAR-RW2/1)."
>
> [Emphasis supplied]

996. Thus, the answer given by this witness to a specific query put by the Tribunal, shown as emphasis supplied for the purpose of convenience, would go to show that these requirements of the claimant State of Goa had not been considered at all by RW2. Even otherwise, the State of Karnataka had not chosen to adduce any positive acceptable evidence on the aspects relating to navigation.

997. It may be relevant for the present purpose to refer to the relevant portions of the Brief Report on the visit of the Mahadayi Water Disputes Tribunal along with legal and technical teams of three co-basin States to various related project sites, etc. in the States of Goa, Karnataka and Maharashtra during

December 12-24, 2013, and the said portions of the Report are as hereunder:

"3.1 Visit to Mormugao Port Trust

A presentation was made by the Chairman, Mormugao Port Trust. He highlighted salient features of the Mormugao Port including its important role in gross domestic product (GDP) of the State of Goa. During the presentation, he also made a mention about the likely impact of reduction in the flow in the river Mahadayi on the operation of the Mormugao Port and hence on State's economy. A copy of the presentation made before the Hon'ble Tribunal is at Annexure-I. Thereafter, the Hon'ble Tribunal and other members of the Team taken around various facilities, particularly the iron ore loading facilities.

During the presentation, the Advocate General, Govt. of Karnataka observed that the statements of the Chairman, Mormugao Port Trust in respect of the activities undertaken or planned by the Govt. of Karnataka were beyond his briefs and that such statements should not be made. It was clarified that the objective of the visit by the Hon'ble Tribunal was to get acquainted with the salient features of the basin and important related activities etc. and that the statements made during the visit would not be taken note of and would not constitute part of the proceedings of the Hon'ble Tribunal unless the same constituted part of the Statement of Case or Statement of Claims made by the respective States.

Based on the contents of the presentation, replies to the queries of the Hon'ble Chairman, MWDT, Hon'ble Members of MWDT and other participants and clarifications made, following important points emerged.

a. Many of the information made available during the course of presentation did not constitute part of the Statement of Case or Statement of Claims made by the States before the Hon'ble Tribunal.

b. No specific studies have been made by Mormugao Port Trust in respect of the minimum quantity of water in river Zuari and river Mandovi that would be required to address the specific issues highlighted in the presentation made.

c. Mormugao Port Trust has not undertaken any study related to future fresh water requirements from rivers and also through other conservation measures including rainwater harvesting etc.

d. Mormugao Port Trust has not made any comprehensive evaluation of likely impacts of water resources development in the entire basin covering all planned developmental activities by all the three co-basin States.

e. Mormugao Port Trust has neither prepared any proposal to address the specific issues highlighted during the presentation nor taken up the same with the Govt. of India.

3.2 Visit to Cumberjua Canal

Hon'ble Chairman, MWDT, Hon'ble Members of MWDT and the members of the visiting Team started from Panaji Jetty and after moving in the upstream of river Mandovi entered into Cumberjua canal and travelled to a considerable distance. A brief note provided by Govt. of Goa on Cumberjua canal highlighting important features is at Annexure – II. During the travel along the canal, the Team could observe low lying ancient reclaimed land called as Khazan land along with banks of the Cumberjua canal. Members of the visiting Team could also observe crocodile on the bank of the canal.

Based on the information provided by the officials, replies to the queries of the Hon'ble Chairman, MWDT, Hon'ble Members of MWDT and other participants and clarifications made, following important points emerged.

a. Cumberjua canal is a natural canal connecting the rivers Mandovi and Zuari in the tidal zone.

b. Cumberjua canal is used as navigation channel for barges to carry ores during high tides and traffic of empty barges during low tides.

c. The flow regime of rivers Mandovi and Zuari are impacted by the canal whenever there is increase or decreases in flow in any of the rivers."

998. Though no separate study as such had been undertaken by the claimant State of Goa from the Report

aforesaid it is clear that the following important points had emerged.

1. Cumberjua canal is a natural canal connecting the rivers Mandovi and Zuari in the tidal zone.

2. Cumberjua canal is used as navigation channel for barges to carry ores during high tides and traffic of empty barges during low tides.

3. The flow regime of rivers Mandovi and Zuari are impacted by the canal whenever there is increase or decrease in flow in any of the rivers."

999. The claimant, State of Goa, pleaded several aspects in relation to these issues in elaboration at paras 18D(ii), 24B and 25C in particular. But, however, these pleas had not been further substantiated except for the important points which had emerged during the spot inspection by this Tribunal as specified supra. It is pertinent to note that question No. 15 to AW5 already had been referred to above and the answer of AW5 in this regard would go to show that no such study had been undertaken by the claimant, State of Goa. Be that as it may, suffice to state that certain important points which emerged, which had been already referred to above, would help the claimant, State of Goa, to some extent.

1000. Section 9 of Inter-State River Water Disputes Act, 1956 deals with Powers of Tribunal. Sub-section (2) thereof specifies that:

> "(2) The Tribunal may require any State Government to carry out, or permit to be carried out, such surveys and investigation as may be considered necessary for the adjudication of any water dispute pending before it."

1001. It would be relevant to have a glance at Section 9 (4) of the aforesaid Act as well, which says:

> "(4) Subject to this Act and any rules that may be made hereunder] the Tribunal may, by order, regulate its practice and procedure."

1002. As already referred to supra, though AW5 admitted that no such study in this regard had been undertaken by the claimant, State of Goa, by virtue of Section 9 (2) of the Act aforesaid, the relevant portion of the spot Inspection Report and important points recorded in the said Report can be relied upon by this Tribunal while answering these issues relating to the aspects of navigation. The evidence available on record as such on these aspects as adduced by the contestant States though unsatisfactory, the relevant portions of the aforesaid Report

would go in aid of the claimant, State of Goa. The scope and ambit of reference of Inter-State river water disputes and the adjudication thereof would be within a narrow compass and this Tribunal may have to answer these issues not in the background of broad vision but within the permissible limits as ordained by the law governing the field.

1003. This Tribunal is not strictly guided or bound to follow the rules of evidence as contemplated by the Indian Evidence Act, in strict sense, though the principles in relation thereto in the realm have to be observed. That being the very scheme of the Act aforesaid, the underlined spirit of the scope of investigation specified in Section 9(2) of the Act, referred to above, would engulf in itself the spot inspection by this Tribunal as well.

1004. In State of Karnataka vs State of Andhra Pradesh & Ors 2000 (9) SCC 572, the Apex Court at para 44 observed:

> "The Inter-State Water Disputes Act having been framed by Parliament under Article 262 of the Constitution, is a complete Act by itself and the nature and character of a decision made thereunder has to be understood in the light of the provisions of the very Act itself. A dispute or difference between two or more State Governments

> having arisen which is a water dispute under Section 2(c) of the Act and complaint to that effect being made to the Union Government under Section 3 of the said Act, the Central Government constitutes a Water Disputes Tribunal for the adjudication of the disputes in question once it forms the opinion that the disputes cannot be settled by negotiations. The Tribunal thus constituted is required to investigate the matters referred to it and then forward to the Central Government a Report setting out the facts as found by it and giving its decision on it as provided under sub-section (2) of Section 5 of the Act."

1005. It is needless to say that the concept of discharge of burden need not be observed in the technical sense and hence the spot inspection report and the relevant portions thereof can be considered by this Tribunal in this regard.

1006. The contestant party States must have mutual understanding and good faith in the user of the Inter-State river waters and should have mutual regard towards the needs of the other riparian States. An unhealthy contest by raising unsustainable pleas without any acceptable evidence whatsoever may land the contestant States nowhere except resulting in some confusion. If there is no just, fair, equi-distribution of Inter-State

River waters subject to the needs of the riparian States, all the States' interest would suffer and their rights would be seriously prejudiced. The needs of the contestant States also have to be balanced with the priorities while dealing with concept of equi-distribution. The disproportionate nexus between the needs of the contestant States and the availability of waters in an Inter-State river can be said to be the principal reason for these quarrels between these States. Mother feeding the children with her milk is akin to the people feeding themselves with common river waters. The political boundaries or barriers must have only a limited role to play.

1007. Thus this Tribunal has to weigh the needs of the contestant States cautiously while dealing with the concept of equi-distribution. All ambitious schemes of the contestant States cannot be permitted. Too much of exaggeration of these claims also may be unfair and unjust. Equally, outright rejection of all such claims may not be just. Thus, the rights of all riparian States are to be equally balanced. Impact on navigation in the context of the flow of Inter-State river waters is an issue concerned with

the national interest in the context of international trade and commerce as well, to some extent.

In the light of the aforesaid discussion, these issues are to be considered and answered.

1008. Though the State of Goa has not undertaken any study in relation to this aspect, it is pertinent to note that during the spot inspection of the Tribunal, certain important points which had emerged already had been referred to supra and hence the claimant State of Goa though had not adduced substantial evidence, is able to establish that:

1. Cumberjua canal is a natural canal connecting the rivers Mandovi and Zuari in the tidal zone;
2. Cumberjua canal is used as navigation channel for barges to carry ores during high tides and traffic of empty barges during low tides; and
3. The flow regime of rivers Mandovi and Zuari are impacted by the canal whenever there is increase or decrease in flow in any of the rivers.

1009. It is needless to say that by virtue of the inspection by the Tribunal inasmuch as some important points emerged which had been referred to above, this Tribunal is of the opinion that in view of the spot inspection report and the important points which ultimately emerged as referred to above, the claimant, State of Goa, has discharged its burden on issues No. 3 and 20 to the extent as reflected by the Brief Report on the visit of this Tribunal during December 12-24, 2013, specified supra.

1010. It is needless to say that the State of Karnataka has not chosen to adduce any evidence and since on the said aspect even judicial notice cannot be taken, it is to be held that the State of Karnataka has failed to discharge its burden in relation to issue No. 50. Hence it is to be held that the claimant, State of Goa, is able to prove Issues No. 3 and 20 to the extent indicated above and the State of Karnataka has failed to prove issue No. 50 and hence this issue has to be answered in the negative.

Thus, these issues are answered accordingly.

DETERMINATION OF WATER REQUIREMENTS OF THREE PARTY-STATES

STATE OFKARNATAKA

1011. The Government of Karnataka, vide its letter No. WRD/08/KDM/2009 dated 22.06.2010 filed as complaint under Section 3 of the Inter State River Water Disputes Act, 1956, read with Inter-State Water Disputes Rules 1959, addressed to the Secretary to the Government of India, Ministry of Water Resources, has inter-alia, made following specific references related to water demands and equitable apportionment as under.

> "…
>
> (d) On an equitable apportionment of the waters of the inter-State river Mahadayi and its valley, whether, the equitable share of the riparian State of Karnataka is not less than 45 tmc annually (consumptive use of 24.15 tmc)?
>
> (e) Whether the State of Karnataka is entitled to execute the Kalasa-Bhanduri project (Drinking Water Project) and divert 7.56 tmc of waters every year of the inter-State river Mahadayi to the Malaprabha river in the Krishna basin?
>
> …
>
> (g) Whether, the State of Karnataka would be justified in diverting waters of the inter-State river Mahadayi and its valley to the Kali river for augmenting the generation of electricity under the existing Kali Hydro

Power Project? If so, what extent of diversion is just and reasonable?
(h) Whether, the State of Karnataka is entitled to execute Kotni hydropower project on the inter-State river Mahadayi for generation of electricity on a main river Mahadayi? If so, to what extent?
…"

1012. Through the Amended Statement of Claims filed on 20.4.2015 (Volume. 129), the State of Karnataka in para 17, has sought following reliefs in respect of the water demand and equitable apportionment of waters of the inter-State river Mahadayi and its valley:

"17.1 Under the above circumstances, and having regard to the requirements of justice and equity, the State of Karnataka humbly prays before this Hon'ble Tribunal to:

(i) Hold that Karnataka's share in the waters of inter-State river Mahadayi and its valley is not less than 24.15 tmc for consumptive utilisation;
(ii) Hold that Karnataka is entitled to divert out of its own equitable share for consumptive utilisation:
    (a) 7.56 tmc to provide drinking water to Hubli-Dharwad cities under the Kalasa-Bhandura nala projects;
    (b) 5.527 tmc to Kali basin to augment the flows of Kali for hydro-power generation under Kali Hydro Electric Project (KHEP);

(c) remaining water for generation of power under Mahadayi Hydro-Electric Project (MHEP) at Kotni and

(iii) Hold that Goa has failed to establish that it is or is likely to be affected prejudicially by the diversion of waters of inter-State river Mahadayi and its valley as proposed by Karnataka.

(iv) Allocate 1.5 tmc for irrigation, drinking purposes and other purposes within the Mahadayi basin of Karnataka.

(v) Declare that the surplus water available in Mahadayi basin at the proposed Kotni dam site is 7 tmc at 75% dependability.

(vi) allocate 7 tmc of surplus water available in Mahadayi basin at the proposed Kotni dam site for utilisation in Malaprabha basin under the three following projects/schemes:

a. 3.00 TMC of water is to be utilized for protective irrigation in the DPAP area of Ramdurga, Soundatti and Bailhongal Talukas by Lift Schemes.

b. 2.00 TMC of water is to be utilized for drinking water and irrigation by recharge of ground water in the DPAP areas of Ramdurga, Soundatti and Bailhongal Talukas.

c. 2.00 TMC to be utilized for areas in Malaprabha Command, which are not getting adequate water as planned.

(vii) Pass any other order or orders as this Hon'ble Tribunal deems fit in the interest of justice and equity."

1013. In view of the information included in the Statement of Claims of the State of Karnataka and related documents, following Issues related to demand of waters of Mahadayi river basin by the State of Karnataka for various purposes, were finally framed for determination vide Tribunal's Order dated 17.7.2015.

> "42. Whether the State of Karnataka proves that its share in the waters of inter-State river Mahadayi and its valley is not less than 24.15 tmc for consumptive utilization?
>
> 43. Whether the State of Karnataka proves that out of its total claims of 24.15 tmc of consumptive use of water: (a) it is entitled to consumptive use and / or diversion of 15.009 tmc of water to be drawn from flow of 75% dependability (i) through diversion of 7.56 tmc to provide drinking water to Hubli-Dharwad cities under the Kalasa-Bhandura nala projects, (ii) through diversion of 5.527 tmc to Kali basin to augment the flows of Kali for hydro-power generation under Kali Hydro-Electric Project (KHEP), (iii) through utilization of 1.5 tmc for irrigation and drinking water purposes within Mahadayi basin, (iv) by accounting for the evaporation losses of 0.4 tmc from Kotni dam, and (v) by accounting for the evaporation losses of 0.022 tmc from Bhandura dam; and (b) it is entitled to diversion of 7 tmc of water from the surplus water at 75% dependability outside the Mahadayi basin for irrigation and drinking purposes by utilizing the carry-over capacity in Malaprabha Dam, and comprising of (i) 3 tmc for protective irrigation in the

DPAP area of Ramudurga, Soundatti and Bailhongal Talukas by Lift schemes, (ii) 2 tmc for drinking water and irrigation by recharge of ground water in the DPAP area of Ramudurga, Soundatti and Bailhongal Talukas , and (iii) 2 tmc for areas in Malaprabha Command which are not getting adequate water as originally planned as the yield has come down from 44 tmc to 27 tmc?

44. Whether the State of Karnataka proves that in addition to its claim of equitable share of 24.15 tmc for consumptive utilization, it is also entitled to non-consumptive use of 13.437 tmc of water for generation of power under Mahadayi Hydro-Electric Project (MHEP) at Kotni?"

1014. The State of Karnataka has not reported any scheme or project through which the waters of Mahadayi river basin is being presently utilized in the State of Karnataka. Shri Mohan V. Katarki, learned Counsel for the State of Karnataka mentioned during the arguments on 21.2.2018 that the existing utilization of water by the State of Goa, in the basin is 9.395 tmc. It is also mentioned by Shri A. K. Bajaj, at Para 10, page 18 of his study titled "Hydrological Analysis of Diversions and Utilizations by the Upstream States in Mahadayi Basin" filed along with his Affidavit dated 30.12.2016 (Volume 194), that the present utilization by Goa is 9.395 tmc. Neither Shri A. K. Bajaj nor any witness examined by the State of Karnataka, has stated and / or informed

the Tribunal as to what is the extent of existing utilization of waters of Mahadayi river basin, by the State of Karnataka. Therefore, the existing utilization of waters of Mahadayi river basin by the State of Karnataka is considered as negligible.

1015. In view of the above, the position in respect of existing utilization and the projected demand of the waters of Mahadayi river basin by the State of Karnataka emerges as under.

A. Existing utilization: Negligible

B. Projected demand of water available at 75% dependability

B(i) In-basin consumptive use

a. 1.5 tmc as projected consumptive use for drinking water and irrigation
b. 0.422 tmc as projected consumptive use in the form of evaporation losses from Kotni dam and Bhandura dam

B(ii) Diversion of water outside Mahadayi basin

a. 7.56 tmc of water for meeting the drinking water needs of Hubli-Dharwad and enroute villages by diversion through Kalasa-Bhandura project by augmenting the waters of Malaprabha reservoir
b. 5.527 tmc of water for hydropower generation by diversion of Mahadyi waters to Supa reservoir through (i) Katla-Palna diversion, (ii) Viranjole diversion, and (iii) Diggi diversion

Thus, the total water demand for consumptive use of water and diversion of water outside the basin, taken together, at 75% dependability is projected by the State of Karnataka as 15.009 tmc.

C. 13.437 tmc of projected demand for non-consumptive use i.e., for hydro-power generation under Mahadayi Hydro-Electric Project (MHEP) at Kotni out of available water at 75% dependability

D. 7 tmc of projected demand of surplus water available in Mahadayi basin at the proposed Kotni dam site at 75% dependability

1016. Before examining the projected demand of waters of Mahadayi river basin by the State of Karnataka for various purposes [either for (a) consumptive use within Mahadayi basin, or (b) for consumptive use outside Mahadayi basin by transfer of water outside the basin, or (c) for non-consumptive uses within the Mahadayi basin or (d) for non-consumptive uses outside the Mahadayi basin by transfer of water outside the basin] at 75% dependability or that out of surplus water over and above the water available at 75% dependability, it is necessary to take into account following important aspects / features, which are germaine, to projected demands of water.

Sustainable Development and Water

1017. Shri Shyam Diwan, learned Senior Counsel for the State of Karnataka during the arguments on 16.2.2018 emphasized the need for sustainable development and quoted extensively from the report titled "Our Common Future" of the World Commission on Environment and Development headed by Gro Harlem Brundtland which was presented to the United Nations General Assembly on 4.8.1987. Shri Diwan, inter-alia, stated as under.

> "On 4.8.1987, the World Commission on Environment and Development headed by Gro Harlem Brundtland presented its report *'Our Common Future'* to the United Nations General Assembly (the "Brundtland Commission Report"). This report was premised on the concept of Sustainable Development, which was defined as:
>
> *"… development that meets the needs of the present without compromising the ability of future generations to meet their own needs.* ***It contains within it two key concepts:***
>
> - ***the concept of 'needs'****, in particular the essential needs of the world's poor,* ***to which overriding priority should be given****; and*
> - *the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."*

The Brundtland Commission Report emphasised the significance of development towards the satisfaction of human needs. The report, *inter-alia*, states:

"Our Common Future, ***Chapter 1: A Threatened Future***
49. Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future. Far from requiring the cessation of economic growth, it recognizes that the problems of poverty and underdevelopment cannot be solved unless we have a new era of growth in which developing countries play a large role and reap large benefits.
Our Common Future, ***Chapter 2: Towards Sustainable Development***

1. The Concept of Sustainable Development
The satisfaction of human needs and aspirations in the major objective of development. The essential needs of vast numbers of people in developing countries for food, clothing, shelter, jobs - are not being met, and beyond their basic needs these people have legitimate aspirations for an improved quality of life. A world in which poverty and inequity are endemic will always be prone to ecological and other crises. Sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life.

6. Meeting essential needs depends in part on achieving full growth potential, and sustainable development clearly requires economic growth in

places where such needs are not being met. Elsewhere, it can be consistent with economic growth, provided the content of growth reflects the broad principles of sustainability and non-exploitation of others. *But growth by itself is not enough. High levels of productive activity and widespread poverty can coexist, and can endanger the environment.* ***Hence sustainable development requires that societies meet human needs both by increasing productive potential and by ensuring equitable opportunities for all.***

11. Economic growth and development obviously involve changes in the physical ecosystem. Every ecosystem everywhere cannot be preserved intact. A forest may be depleted in one part of a watershed and extended elsewhere*, which is not a bad thing if the exploitation has been planned and the effects on soil erosion rates, water regimes, and genetic losses have been taken into account. In general, renewable resources like forests and fish stocks need not be depleted provided the rate of use is within the limits of regeneration and natural growth. But most renewable resources are part of a complex and interlinked ecosystem, and maximum sustainable yield must be defined after taking into account system-wide effects of exploitation."*

1018. Thereafter, Shri Shyam Diwan, referred to the provisions of the India National Environment Policy, 2006 which are as under.

"India's National Environment Policy, 2006, *inter-alia*, states:

Economic growth, in its turn, bears a dichotomous relationship to environmental degradation*. On the one hand, growth may result in "excessive" environmental degradation through use of natural resources and generation of pollution aggravated by institutional failures. If impacts on the environmental resource base are neglected, an incorrect picture is obtained from conventional monetary estimates of national income.* ***On the other hand, economic growth permits improvement in environmental quality by making available the necessary resources for environmental investments, and generating societal pressures for improved environmental behaviour, and institutional and policy change****.*

…

The following Principles, may accordingly, guide the activities of different actors in relation to this policy. Each of these Principles has an established genealogy in policy pronouncements, jurisprudence, international environmental law, or international State practice:

i. ***Human Beings are at the Centre of Sustainable Development Concerns:*** *Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.*

ii. ***The Right to Development:*** *The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.*

iii. *Environmental Protection is an Integral part of the Development Process: In order to achieve sustainable development,* ***environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.***

The principle of sustainable development has been recognised by the Indian Courts as an integral part of environmental jurisprudence. The State of Goa has also placed reliance on the principle of sustainable development and has called it "pre-eminent and salutary principles of law" in its written submission (page 416-423, Vol-II)."

1019. After citing various judgements of the Supreme Court namely, in cases of (i) Banwasi Seva Ashram *vs* State of UP (1986) 4 SCC 753, (ii) Vellore Citizens' Welfare Forum *vs* Union of India (1996) 4 SCC 647, (iii) M. C. Mehta (Taj Trapezium Matter) *vs* Union of India (1997) 2 SCC 353, (iv) Consumer Education and Research Society *vs* Union of India (2000) 2 SCC 599, (v) Narmada Bachao Andolan*vs* Union of India (2000) 10 SCC 664,(vi) Essar Oil Ltd. *Vs* Halar Utkarsh Samiti (2004) 2 SCC 392,(vii) N. D. Jayal *vs*Union of India (2004) 9 SCC 362, and (viii) Bombay Dyeing and Mfg. Co. Ltd. (3) *vs* Bombay Environmental Action Group (2006) 3 SCC 434, Shri Diwan canvassed as under.

(1) The projects proposed by the State of Karnataka are all consistent with the principles of sustainable development. As far as uses, such as drinking water are concerned, providing adequate water is an obligation of every State with respect to every citizen. The right to potable water is an aspect of Article 21 of the Constitution and the State of Karnataka is duty bound to ensure that the inhabitants of the twin city of Hubli-Dharwad, etc. receive drinking water in the decades to come. Projects to secure drinking water take several years to implement and the only manner of ensuring reliable drinking water supply to the cities of Hubli-Dharwad would be through the Kalasa and Bhandura schemes.

(2) Another important dimension of sustainable development requires mitigation measures to be adopted so as to minimize the adverse environmental impact. This aspect will be fully addressed during the EIA process with its checks and balances including public hearings, expert environmental appraisal and appellate oversight by the National Green Tribunal (where the environmental clearance is challenged). The projects proposed by Karnataka minimize diversion of forest lands and are generally outside the boundaries of any sanctuary or national park. Consequently, there

will be a limited or *de minimis* impact as far as wildlife and forests are concerned.

(3) In so far as the hydropower dimension of various proposed projects are concerned, hydropower is regarded as an environment friendly manner of generating electricity. This is because it is a renewable resources and because it does not involve burning of any fossil fuel which could lead to global warming through discharges of greenhouse gasses. Besides, the major component of the hydropower project concerning Kotni dam involves generation through run-of-the-river with the water flowing into the State of Goa. Significantly, the Kotni dam reservoir and discharges, after the proposed project is completed will ensure a discharge into the State of Goa, during the lean season (non-monsoon months) and thereby possibly enhance the flow of the Mahadayi river.

(4) The principle of sustainable development is being strictly adhered to and the allocation sought by the State of Karnataka would advance sustainable development.

<u>Sustainable Development of Water Resources</u>

1020. In this regard, the Tribunal notes that the Para 11 of Chapter 2 of the "Brundtland Commission Report", states as under.

> "… In general, renewable resources like forests and fish stocks need not be depleted provided the rate of use is within the limits of regeneration and natural growth. But most renewable resources are part of a complex and interlinked ecosystem, and maximum sustainable yield must be defined after taking into account system-wide effects of exploitation."
>
> [Emphasis supplied]

1021. The Tribunal also notes that the Section 4 of the Principles of the National Environment Policy 2006, inter-alia states as under.

> **" …**
>
> **iii. Environmental Protection is an Integral part of the Development Process:**
>
> In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it."

1022. It is observed by the Tribunal that the above said two important aspects, which are primarily related to the sustainability of the water resources, have not been considered or duly addressed, while assessing the utilizable water out of

available water as a part of the planning process, by the learned Senior Counsel while emphasising the use of scarce water resources for sustainable development of the society as a whole.

1023. Shri Diwan, learned Senior Counsel has merely stated that the aspect related to environmental impacts will be fully addressed during the EIA process with its checks and balances including public hearings, expert environmental appraisal and appellate oversight by the National Green Tribunal (where the environmental clearance is challenged). The Tribunal finds that, undoubtedly, such fragmented approach is a matter of concern.

1024. The National Water Policy 2012 at Para (vii) of the Preamble has categorically raised concern about fragmented approach. Para (vii) of the Preamble of the National Water Policy 2012 states as under.

> "(vii) Water resources projects, though, multi-disciplinary with multiple stakeholders, are being planned and implemented in a fragmented manner without giving due consideration to optimum utilization, environment sustainability and holistic benefit to the people."

1025. Further, the National Water Policy 2012 provides for planning of water resources projects after considering social and environmental aspects also. Obviously, such issues cannot be left to be examined at the appraisal stage. Para 9.2 of the National Water Policy 2012 states as under.

> 9.2 Being inter-disciplinary in nature, water resources projects should be planned considering social and environmental aspects also in addition to techno-economic considerations in consultation with project affected and beneficiary families. The integrated water resources management with emphasis on finding reasonable and generally acceptable solutions for most of the stakeholders should be followed for planning and management of water resources projects.

1026. The Tribunal notes that para 18.2 of the Chapter 18 "PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES" of Agenda 21 of UN Documents (available at web site https://sustainabledevelopment.un.org/content/ documents /agenda21.pdf) which was adopted at the Earth Summit held in Rio de Janerio in 1992 states as under.

> "18.2. Water is needed in all aspects of life. The general objective is to make certain that adequate supplies of

> water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Innovative technologies, including the improvement of indigenous technologies, are needed to fully utilize limited water resources and to safeguard those resources against pollution."

The Tribunal is of the firm opinion that the phrases "while preserving the hydrological, biological and chemical functions of ecosystems" and "activities within the capacity limits of nature" in the above quoted para, are very important and should guide the Tribunal while considering the concept of sustainable development.

1027. In the year 2000, the United Nations General Assembly adopted the "United Nations Millennium Declaration" which, in very clear terms, call to stop the unsustainable exploitation of water resources which is available at the web site http://www.un.org/millennium/declaration/areas552e.htm. The relevant para (para 23 under section IV. Protecting our common environment) are reproduced hereunder.

> **"IV. Protecting our common environment**
> 23. We resolve therefore to adopt in all our environmental actions a new ethic of conservation and stewardship and, as first steps, we resolve:
> …
> • To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies.
> …"

1028. The Tribunal notices that despite the need for in-depth studies, essentially needed for ensuring sustainable planning in a comprehensive manner, the ground reality is far from what is desirable. This has been very clearly brought out in the first chapter of the First United Nations World Water Development Report – Water for People Water for Life (UNWWDR1), a joint report by the twenty-three UN agencies concerned with freshwater. The Report is available at web site http://www.unwater.org.publication/water-people-water-life. The relevant extracts are reproduced hereunder.

> "Water is essential for life. We are all aware of its necessity, for drinking, for producing food, for washing – in essence for maintaining our health and dignity. Water is also required for producing many industrial products, for generating power, and for moving people and goods – all of which are important for the functioning of a

> modern, developed society. In addition, water is essential for ensuring the integrity and sustainability of the Earth's ecosystems. None of these facts are in dispute. And yet, we all too often take the availability of water for granted, as if there existed an abundance of the resource. This assumption has now been challenged and found to be untenable. …"

1029. The prevailing situation has more emphatically been highlighted in the Second United Nations World Water Development Report – A shared Responsibility (UNWWDR2), published in the year 2006. The Report is available at web site http://www.unwater.org.publication/water-shared-responsibility The opening paragraph of the Part 1, Global Hydrology and Water Resources of the said UNWWDR2 states as under.

> "The need to develop more sustainable practices for the management and efficient use of water resources, as well as the need to protect the environmental ecosystems where these resources are located, has led to fundamental shifts in awareness and public concern over the past decade. However, despite increased awareness of the issues at stake, economic criteria and politically charged reasoning are still driving water resource development decisions at most local, regional, national and international levels. Though the long-term benefits of an integrated approach to achieving sustainable water resources development have been cited in many of the global water conferences over the

> past decade, considerable time and change in policy will be required to implement such an approach. At present, best available practice and scientific knowledge are rarely adequately factored into decision-making or well represented when establishing water resource policy or implementing management practices. In the mean time, the pressures on our water resources are increasing."

1030. The Chapter 16 – the Way Forward of the Second United Nations World Water Development Report – Water in a Changing World (UNWWDR3), published in the year 2009 and available at web site http://www.unwater.org.publication/water-changing-world, concludes with following.

> "The challenges are great, but the unsustainable management and inequitable access to water resources cannot continue– because the risks of inaction are even greater. We might not have all the information we would like to have before acting, but we know enough to begin to take significant actions. Some leaders are already acting, showing the way. Others are ready to act. Leaders inside and outside the water domain have critical, complementary roles. Leaders in the water domain can inform the processes outside this domain and manage water resources to achieve agreed socioeconomic and environmental objectives. But leaders in government, the private sector and civil society determine the direction that actions will take. Recognizing this, they must act now!"

Environmental Considerations in Water Resources Planning

1031. As mentioned at Para 8, Shri Shyam Diwan, learned Senior Counsel for the State of Karnataka referred to some specific provisions of the National Environment Policy 2006. The National Environment Policy 2006 is available at the web site www.moef.gov.in/sites/default/files/introduction-nep2006e.pdf. Under Section 4, para iii, page 11 of the National Environment Policy 2006, it is stated that in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. It is therefore, expected that all needed studies including "Environmental Impact Assessment" (EIA) and appropriate provisions would be part of the planning and the Detailed Project Report (DPR) which would be followed by environmental appraisal by the competent agencies. The EIA and DPR would be basis for mandatory clearance related to environment.

1032. Regarding the preparation of Environmental Impact Assessment (EIA) Report, the Ministry of Environment, Forest and

Climate Change has formulated "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environment Clearance under EIA Notification, 2006 (MARK-37)".

1033. The Tribunal notes that the State of Karnataka has not mentioned about the studies related to environmental impact assessment as per the "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environmental Clearance under EIA Notification 2006" issued by the Ministry of Environment, Forest and Climate Change in any of the pleadings or documents filed with the Tribunal. It is, however, noted that an environmental Impact assessment of proposed Mahadayi Hydro Electric Project was conducted by the National Environmental Engineering Research Institute (NEERI), Nagpur and a report on the same was prepared in September 1997 at the request of Karnataka Power Corporation Limited. A copy of the Report of NEERI has been filed by the State of Karnataka as Annexure 8 of the Statement of Claims (Volume 12 & 13). The Report of NEERI was completed long back in September 1997 and therefore, it is not in accordance with the "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environmental Clearance under EIA

Notification 2006" issued by the Ministry of Environment, Forest and Climate Change and therefore, it is difficult to accept the same.

1034. In its Statement of Case, the State of Goa has highlighted the issues relating to environmental protection including environmental flows. The State of Goa has also examined Shri Rajendra P. Kerkar as a witness on the subject of environment and ecology.

1035. Shri Kerkar, the witness of the State of Goa has made specific recommendations at Para 39, pages 38-42 of his Affidavit dated 11.11.2017 (Volume 211). These recommendations, inter-alia, include recommendation in respect of environmental flow. It is, however, noted that the recommendations of Shri Kerkar in respect of environmental flow are based on the Research Report No. 107 of International Water Management Institute (IWMI), titled 'An Assessment of Environmental Flow Requirements of Indian River Basins' by V Smakhtin and M Anputhas [MARK-GOA/35(Colly)]. From replies of Shri Kerkar to specific questions, it is evident that the Research Report No. 107 has neither been critically examined nor accepted by the Ministry of Environment,

Forest and Climate Change. It is also noted by the Tribunal that the authors have indicated in the Section on 'Conclusions and the Way Forward' of the said Report that their study is impacted because, they had not been effectively supplied with observed flow data of reasonable amounts and quality and that the data which were acquired and used were primarily from publicly available sources (Internet) where data are outdated and no conclusions on the accuracy or even origin of the data could be made. It has further been indicated by the authors that if the situation with access to data in India is not changed, any further EFA will be largely speculative.

1036. At this stage, the Tribunal notes that, it is necessary, to refer to question Nos. 3 and 4 put to Shri Rajendra P. Kerkar by the Tribunal, on 23.11.2017 and the answers of Shri Kerkar, which are reproduced hereunder.

> "Q. No. 3. At Para 37, page 37 of your Affidavit dated 11.11.2017 (Vol. 211), you have mentioned about a research work done by V Smakhtin and M Anputhas, working in the International Water Management Institute (IWMI), and published as Research Report 107 'An Assessment of Environmental Flow Requirements of Indian River Basins'.

It appears that findings of the above mentioned Research Report 107 are the basis for your Recommendations 2, 3, and 5 on pages 39 to 41 of your Affidavit dated 11.11.2017 (Vol. 211).

Have the findings of the Research Report 107 of IWMI been critically examined and accepted by the Ministry of Environment and Forest and Climate Change?

Ans. As per my knowledge, and information the findings of the Research Report 107 of IWMI has not been examined and accepted by the Ministry of Environment & Forest and Climate Change.

Q. No. 4. Along with your Affidavit dated 11.11.2017, you have appended Annexure-IX, being An Assessment of Environmental Flow Requirements of Indian River Basins. The said Document is already taken on record and is marked as MARK-GOA/35.

The Section on 'Conclusions and the Way Forward' of the Research Paper 107 of IWMI, inter-alia states as under. [Ref: Page 255 of your Affidavit dated 11.11.2017 (Vol. 212),

"The study has effectively not been supplied with observed flow data of reasonable amounts and quality. The data which have been acquired and used were primarily from publicly available sources (Internet) where data are outdated and no conclusions on the accuracy or even origin of the data could be made. If

> the situation with access to data in India is not changed, any further EFA will be largely speculative. …"
>
> How the results of such study can be considered as reliable and recommended to be adopted for application?
>
> Ans. The result derived by using global flow data base and by using e-flow calculator helps to get reliable data as per my knowledge."

1037. In view of the position emerging from the above, the Tribunal is of the opinion that the recommendations of Shri Rajendra P. Kerkar, Witness of the State of Goa in respect of environmental flow cannot be accepted.

1038. In this regard, the Tribunal notes that on page 48 of "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environmental Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change published in April 2015 (MARK-37), there is specific mention about environmental flow release as under.

> "- Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall

be decided by the Committee based on the hydrology and available discharge.
- A site specific study on minimum environmental flow should be carried out."

The Tribunal is of the view that in the absence of any specific study and other reliable recommendation and or data, the procedure prescribed for assessment of environmental flow on page 48 of "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environmental Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change published in April 2015, must be adopted.

Examination of the Claims of the State of Karnataka

1039. The State of Karnataka has re-iterated its Claims in para 1.5 of the "Written Submissions on behalf of the State of Karnataka" filed on 15.1.2018 (Volume 220). The State of Karnataka has, inter-alia, argued that the question of justification of diversion is not necessary on the face of 143.455 tmc being the surplus water within the 75% dependable flow of 199.6 tmc. Without going into the reliability of the specific figures of the

water availability used for such justifications, the Tribunal finds that the State of Karnataka has grossly erred in justifying its Claims on the basis of water balance study of the entire Mahadayi Basin taking into consideration only the consumptive uses of the party States. To understand the needs of river system, it is necessary to appreciate the functions of the river system and how it survives. This aspect has been duly elaborated in paras 128 and 129 of the Interim Order dated 27.7.2016 of this Tribunal, which are reproduced hereunder.

> "128. A river is a large, natural stream of flowing water. Rivers are found on every continent and on nearly every kind of land. Some flow all year round. Others flow seasonally or during wet years. Goa claims that Mahadayi is a monsoon flowing river.
>
> 129. The beginning of a river is called its source or headwaters. From its source, a river flows downhill as a small stream. Precipitation and groundwater add to the river's flow. Together a river and its tributaries make up a river system. A river system is also called a drainage basin or watershed. A river's watershed includes the river, all its tributaries and any groundwater resources in the area. The end of a river is its mouth. Here, the river empties into another body of water – a large river, a lake, or the ocean. The flowing water of a river has great power to carve and shape the landscape. The

energy of flowing river water comes from the force of gravity, which pulls the water downward. The steeper the slope of a river, the faster the river moves and the more energy it has. The movement of water in a river is called a current. Little by little, a river tears away rocks and soil along its bed and carries them downstream. The river carves a narrow, V-shaped valley. Rapids and waterfalls are common to rivers, particularly near their sources. Eventually, the river flows to lower land. As the slope of its course flattens, the river cuts less deeply into its bed. At the same time, the river begins to leave behind some of the rocks, sand and other solid material, it collected upstream. This material is called sediment. Once the sediment is deposited, it is called alluvium. Alluvium may contain a great deal of eroded top soil from upstream and from the banks of its meanders. Because of this, a river deposits very fertile soil on its flood plain. A flood plain is the area next to the river that is subject to flooding. Near the end of its journey, the river slows and may appear to move sluggishly. Where the river meets the ocean or a lake, it may deposit so much sediment that new land, a delta, is formed. Not all rivers have deltas. Rivers have always been important to people. In prehistoric times, people settled along the banks of rivers, where they found fish to eat and water for drinking, cooking and bathing. Later, people learned that the fertile soil along rivers is good for growing crops. The world's first great civilization arose in the fertile flood plains of the Nile in Egypt, the Indus in southern Asia, the Tigris and the Euphrates in the Middle East, and the Huang (Yellow) in China. Centuries later, rivers provided routes for trade, exploration and settlement. When towns and industries

developed, the rushing water of rivers supplied power to operate machinery. Rivers continue to provide transportation routes, water for provide drinking and for irrigating farmland and power for homes and industries.

Rivers are important for many reasons. One of the most important things they do is to carry large quantity of water from the land to the ocean. There, seawater constantly evaporates. The resulting water vapour forms clouds. Clouds carry moisture over land and release it as precipitation. This fresh water, feeds rivers and smaller streams. The movement of water between land, ocean, and air is called the water cycle. The water cycle constantly replenishes Earth's supply of freshwater which is essential for almost all living things. Except some few rivers, all rivers ultimately flow into the sea whether it is Arabian Sea or Bay of Bengal etc. Before merging into the sea the water of a river is available for consumptive and non-consumptive uses by the States concerned. Therefore, merging of water of river Mahadayi into the Arabian sea irrespective of its uses, cannot be considered to be wastage of water. The plea of wastage of water may become relevant if surplus water is available. As indicated in the earlier part of this order, this Tribunal has come to the conclusion that the State of Karnataka has failed to establish at this stage that the surplus water is available at the three points from which the water is sought to be transferred to Malaprabha basin if water available is 108.72 tmc at 75% dependability in the Mahadayi basin. For this reason, it is difficult for the Tribunal to accept

the case of Karnataka that water goes into the sea as wastage."

What is relevant for the project planning is the water availability as well as the needs at the identified project sites, along with its sustainability.In view of paras 1017 to 1038, the Tribunal considers it proper and appropriate to examine the proposed demands for using the Waters of the Mahadayi river basin by the State of Karnataka from following view-points:

a. Rationale of the needs including the quantum of water required for specific purposes;
b. Reasonability and reliability of the assessment of availability of water at the project sites;
c. Assessment of quantum of water necessarily required for environmental sustenance; and
d. Quantum of water which can be safely diverted for the projected uses and contribute to sustainable development of the areas where the water is proposed to be used.

The Tribunal is of the view that the above systematic approach is necessary to ensure that the projects sustain and continue to

serve the purpose for which the projects are envisaged and planned.

1040. This is more so in view of the details which have been brought to the notice of the Tribunal in respect of two projects, namely, Malaprabha Reservoir Project and Kali Hydro Electric Power Project, which are central to the plans of the State of Karnataka for proposed use of the waters of the Mahadayi river basin.

1041. The State of Karnataka proposes to divert a total of 14.56 tmc (7.56 tmc at 75% dependability and 7 tmc of surplus water, over and above the availability at 75% dependability) of waters of Mahadayi river basin to Malaprabha reservoir. It is noted that the Malaprabha Reservoir Project was initially planned with assessed water availability of 47.25 tmc at 75% dependability in the year 1970. However, subsequently the water availability at 75% dependability was found to be 26.76 tmc only. The Para 5 at page 11 of the study of Shri A. K. Bajaj, Expert Witness of the State of Karnataka filed along with his Affidavit dated 30.12.2016 (Volume 194) are reproduced hereunder.

> "5. There were no measurements at the Malaprabha Dam site during the planning stage in 1970 when, the project was being formulated. The yield at the dam site was estimated on the basis of 30 years rainfall records and gauge data of 12 years of a downstream site (Kolchi Weir). This was cross verified by using isohyetal methods and on the basis of records of hydrologically similar catchments. Ultimately, the yield at 75% dependability on the basis of rainfall records was adopted as 47.25 tmc. (See page 100 to 103, Vol. 129 filed by Govt of Karnataka on 17.04.2015)
>
> 6. However, during the performance of the project after construction, the inflows started to be recorded giving yield figures at the dam site. The yield on the basis of the measured series of the 34 years for the period from 1972-73 to 2005-06, at 75% dependability was 26.76 tmc only [See page 65, Vol. 33(b)]. Thus, the project report which contemplated an utilisation of 44 tmc had to be modified for the revised actual water available. This report titled "Modified Detailed Project Report of Malaprabha Project" was prepared by the office of the Chief Engineer, Karnataka Neeravari Nigam Limited [A Government of Karnataka Enterprise) in the year 2009 for utilisation of 27 tmc (See Vol.33 (b)]."

1042. At this stage, the Tribunal finds it necessary to refer to the pertinent observations made by Krishna Water Disputes Tribunal in respect of the Malaprabha Project, which are quite relevant. Part of the Report of Krishna Water Dispute Tribunal

has been filed as MARK-KA/26 (Colly). However, the Report is available at web site of the Union Ministry of Water Resources, River Development and Ganga Rejuvenation http://mowr.gov.in/sites/default/files/KWDTReport9718468760.pdf. Relevant extracts from the "Report of the Krishna Water Disputes Tribunal with Decisions (Volume II), 1973 are as under.

> "…
> The Project Report to be referred to in respect of this Project is MYPK-2 and MYPK-5.The Malaprabha Project was sanctioned in the year1963 for a gross utilisation of 37.2 T.M.C., vide Planning Commission's letter No. NR-2(54)/60 dated 5th August, 1963 (un-numbered first page of MYPK-2or MYDK-12, page 7, Ex. APK-313).The Project is modified in the year 1970 by increasing the utilisation to 44 T.M.C. as under (page15 and page 17 of MYPK-5).
> …
> In our opinion the demand for the additional 7 T.M.C. for this Project is worth consideration.
> …"

Apparently, the extent of utilization from the project was enhanced to 44 tmc in the year 1970 from the earlier figure of 37.2 tmc as per the project approved by the Planning Commission in the year 1963.

1043. Obviously the planners of the Malaprabha Project miserably failed in making reliable assessment of the water availability at the project site. As a result, the Malaprabha project has not been able to meet the expectations of the stakeholders from the project.

1044. Almost similar situation of incorrect assessment of availability of water prevails in case of Kali Hydro Electric Power Project. It is noted that the Kali project was initially planned with estimated average yield of 119.84 tmc. However, after the construction of the project, the average yield has been found to be 95.66 tmc only. The relevant extracts from the study of Shri A. K. Bajaj, Expert Witness of the State of Karnataka filed along with his Affidavit dated 30.12.2016 (Volume 194) are reproduced hereunder.

> "8. The catchment area at Supa Dam site (Kali Dam) across river Kali which is a west flowing river is 408 sq. miles(1057 sq.kms) and the average yield estimated on the basis of rainfall was 119.84 tmc (3394 M.cum). The construction of the project which was started in 1971 was completed in 1987. The gross storage capacity at full reservoir level and maximum water level is 147.54 tmc (4178 M.cum) and 151.96 tmc (4303 M.cum) respectively and live storage capacity is 132.73 tmc (3758.4 M.cum). The main components of the project

> are the Supa Dam with a designed storage capacity of 147.54 tmc and a power house for hydel generation. Again, as in the case of the Malaprabha Dam, the water yield at the time of planning the project appears to have been over estimated and the Supa Dam has filled only twice out of 29 years (1994 and 2006) since the start of filling in 1984. The recorded average yield is only 95.66 tmc. …"

1045. The over-estimation of the available water resources at the time of planning has, undoubtedly, resulted in creation of facilities which are not fully utilized. Obviously, such errors in the estimation of available resources was a major lapse, error, fault, mistake, criminal negligence, omission, oversight and slip on part of the engineers and other high officials of the State of Karnataka who had designed, planned and prepared DPR, while constructing Malaprabha reservoir. Construction of such a big reservoir with assessed water availability of 47.25 tmc at 75% dependability, must have involved, use of great labour force, use of great quantity of building materials, occupation of vast / large land and investment of very very large sum of public money. All these had gone into vain / waste, when one fine morning, it was realised that the water availability was only 26.76 tmc, instead of assessed water availability of 47.25 tmc. Further, as admitted by Shri A. K. Bajaj, witness for the State of Karnataka, in para 8 of his

affidavit dated 30.12.2016, as in the case of Malaprabha dam, the water yield of Supa reservoir at the time of planning the dam was over assessed / estimated. Thus the Tribunal is of the opinion that the State of Karnataka is, in the habit of overestimating its water availability and the projected water availability has no legs to stand.

1046. In these circumstances, it becomes fundamental, basic, central and primal duty of this Tribunal to examine critically and judiciously, the rationale of the needs of the Karnataka, including the quantum of water required for specific purposes, and reasonability as well as reliability of the assessment of availability of water at the project sites.

1047. The Tribunal considers it necessary to have proper evaluation of the projected demands for various purposes as outlined in Para 1015. The projected demand of waters of Mahadayi river basin by the State of Karnataka have accordingly been examined in the following paras.

In-basin Consumptive Needs of Water of Mahadayi river basin by the State of Karnataka

1048. The State of Karnataka has projected a demand of 1.5 tmc for consumptive use of drinking water and irrigation in the Mahadayi river basin through Mahadayi Hydro-Electric Project (MHEP). In the "Project Report for In-basin utilisation of Mahadayi Waters in Karnataka"- Annexure 73 to the Statement of Claims filed by the State of Karnataka on 21.10.2013 [Volume 54(d)], the total in-basin requirement for different purposes are given at Para 2.4 as under:

a. Drinking water requirement – 0.05 tmc
b. Irrigation requirement – 1.00 tmc, and
c. Industrial and other requirements – 0.45 tmc

In this regard, it is necessary to notice that the State of Goa and the State of Maharashtra have not raised any objection to the proposal for in-basin uses projected by the State of Karnataka. In fact, on the last date of hearing i.e., on 22.2.2018, Shri Atmaram N. S. Nadkarni, the learned Senior Counsel for the State of Goa, on instructions, had fairly conceded that in-basin needs of the State of Karnataka and the State of Maharashtra be granted by the Tribunal. It is also found that the total in-basin requirement projected by the State of Karnataka is only about 1.5 tmc and the water available at the project site i.e., Mahadayi

Hydro-Electric Project is found to be of the order of about 10.8 tmc as per the analysis made by the Tribunal. Further, basic objective of the Mahadayi Hydro-Electric Project is to generate hydropower. The releases from the Project after hydropower generation would be available in the downstream reaches of the river which could duly take care of the environmental needs with appropriate regulation schedule. Therefore, it is not considered necessary to go into critical examination of the projected consumptive demand of 1.5 tmc by the State of Karnataka. The demand of the State of Karnataka for 1.5 tmc for consumptive use of drinking water and irrigation in the Mahadayi river basin through Mahadayi Hydro-Electric Project (MHEP) is considered as acceptable and is hereby granted by the Tribunal.

1049. The State of Karnataka has also mentioned about the consumptive use of about 0.422 tmc in the form of evaporation losses comprising of 0.4 tmc from Kotni dam and 0.022 tmc from Bhandura dam. Evaporation losses from reservoir are inevitable and the exact quantum of such losses would depend on many factors including the final configuration of the project, particularly the features of the reservoir to be created and the regulation schedule to be adopted. However, the quantum of

consumptive usage in the form of evaporation losses from the reservoir is relatively very small and hence there is no need for in-depth examination of this aspect at this stage. The suggested consumptive use on account of evaporation losses from the reservoir as proposed by the State of Karnataka is therefore, granted by the Tribunal.

Diversion of 7.56 tmc of Water from Mahadayi River Basin to Malaprabha Reservoir

1050. The State of Karnataka has not proposed any in-basin consumptive use other than what is mentioned in the preceding paras. The State of Karnataka has, however, proposed diversion of 7.56 tmc of water for meeting the drinking needs of Hubli-Dharwad and enroute villages by diversion through Kalasa-Bhandura project to Malaprabha Reservoir. The Tribunal notes that the proposed projects i.e., Kalasa-Bhandura projects for diversion of 7.56 tmc of water of Malaprabha reservoir, have been major source of disputes between the State of Karnataka and the State of Goa. The Tribunal also notes that the diversion of water is proposed by constructing three reservoirs namely; Bhandura, Haltara and Kalasa and a set of diversion tunnels.

1051. As discussed earlier, it is necessary to examine the various aspects particularly, the quantum of projected demands, reasonability and reliability of assessment, availability of water at the Project sites, assessment of quantum of water necessarily required for environmental sustenance, etc.

1052. The State of Karnataka has filed the "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc. from Malaprabha reservoir" as Annexure-61 to the Statement of Claims of the State of Karnataka (Volume 16). In this regard, the State of Karnataka has also examined Shri G. M. Madegowda as a witness. The Affidavit filed by Shri G. M. Madegowda (Volume 207), the Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc. from Malaprabha reservoir, along with other available information particularly, the observations of the State of Goa either through its Statement of Case (Volume 131) or through the various questions put to Shri G. M. Madegowda, the witness of the State of Karnataka and the other relevant documents filed by the party States have been examined by the Tribunal in great detail, to ascertain the extent of the rationale behind the quantum of water projected as the demand for drinking purpose.

1053. From the "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc. from Malaprabha reservoir, Nov. 2012" (Vol 16), it is clear that the requirements of water of 7.56 tmc have been assessed for future, up to the year 2044 as indicated in Table-3, page 11. In the Table-3, page 11 the requirements of water for drinking purposes have been assessed for future, up to the years 2021, 2031, 2041 and 2051. Thereafter, the water demand for the year 2044 has been computed. Shri G. M. Madegowda, the witness of the State of Karnataka was asked to explain as to why the specific year 2044 was selected for assessment of the drinking water requirement. Shri G. M. Madegowda explained that "the year 2044 AD has been chosen for assessing the future projections, since a period of three years is taken for implementation of the Project, and therefore, from the year 2041, (30 years from 2011), the year 2044 was selected". The question No. 7, put to Shri Madegowda and the answer of the same, are reproduced hereunder.

> "Q.No.7. At Para 16, page 14 of your Affidavit dated 9.11.2017 (Vol. 207), you have inter-alia stated as under:
>
> "In conclusion, I submit that Hubli-Dharwad and en-route villages and town etc. require about 7.56 tmc of

water by the end of 2044 AD. The State Government has improved the water supply infrastructure and at present the work undertaken would ensure supply of 5.20 tmcft of water on 24x7 basis if Malaprabha dam is augmented by Mahadayi water to the extent of 7.56 tmc. The diversion from Mahadayi is necessary to relieve the burden on the existing water of Malaprabha dam, which is required for meeting the requirements of command areas, etc."

In this regard, please answer the following:

a. Why the year 2044 AD has been chosen for assessing the future projection of water requirement and the projection not made for commonly used period, say, up to 2050 AD or 2051 AD etc.?
b. Why augmentation of full projected requirements of water from new sources has been considered necessary and why the quantum of water already available from the existing sources has not been taken into consideration while assessing the requirement of water from new sources?
c. What precisely you mean by the above statement: "relieve the burden on the existing water of Malaprabha dam which is required for meeting the requirements of command areas, etc."? Why do you consider water needs for drinking water supply of Hubli-Dharwad twin city, which has the highest priority, as a burden?

Ans. I wish to answer the question in three parts.

a. The year 2044 AD has been chosen for assessing the future projections, since a period of three years is taken for implementation of the Project, and therefore, from the year 2041, (30 years from 2011), the year 2044 was selected.
b. The earlier three sources which were existing, were not providing sufficient quantity of water any more. Therefore, the water from new sources was sought to be tapped. However, whatever water is available from the existing source, i.e. Neersagar reservoir, is also being taken for the purpose of planning.
c. I feel that the drinking water supply to Hubli-Dharwad twin city cannot, in any manner, be considered as a burden."

1054. The reason put forth by Shri Madegowda that the year 2044 was chosen to take care of 30 years of advance planning (from the year 2011) and including 3 years for the implementation of the project at the time of preparation of the report in the year 2011 is not at all convincing. It is not based on well-established principles of advanced planning or careful study undertaken by the State of Karnataka nor it is supported by any scientific literature and / or standard book approved either by Central Government or any of its agencies. It is interesting to notice that the value of 7.56 tmc of water by diversion from Mahadayi basin to Malaprabha basin for meeting the drinking

water requirements of Hubli-Dharwad is mentioned in the Letter No. 11/7/2000-BM/297 dated 30.4.2002 of the Ministry of Water Resources, Government of India (Page 101-102 of Volume 11) and is also mentioned in the Letter No. WRD 4 VEBATA 2000 (P) dated 30.3.2002 of the Government of Karnataka addressed to the Secretary, Ministry of Water Resources, Government of India (Pages 86-88 of Volume 11). Obviously, in the months of March – April of the year 2002, the need for drinking water could not have been projected to be 7.56 tmc, which is just like a flowing river.

1055. However, in reply to a subsequent question, Shri Madegowda mentioned that the assessment of 7.56 tmc was corresponding to the year 2046 and not 2044. The question No. 8 put to Shri Madegowda and the reply thereof are reproduced hereunder.

> "Q.No.8. Please refer to Table 3, page 11 of the Annexure-61, "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc., from Malaprabha reservoir" (Vol. 16) filed by the State of Karnataka. It is noted that the domestic water demand has been estimated for the years 2011, 2021, 2031, 2041 and 2051 and then for 2044. Interestingly, subsequent Tables (e.g., Table 3.1, Table 3.1.1 and Table 3.2 whose data are used for finalization of Table 3) do not include figures for 2044.

Why the water demand figures for the year 2044 AD have been indicated in the Table 3 only; and how the figures corresponding to 2044 AD have been arrived at?

(The Tribunal's questions to Shri G.M. Madegowda, RW4, remained inconclusive when the Tribunal rose for the day at 4.00 p.m. Further questions by the Tribunal to Shri G.M. Madegowda to be resumed on 01.12.2017, and the witness stands bound over to the next date of hearing, on 01.12.2017 at 11 A.M.)

Answer to Question No. 8, which remained un-answered on 30.11.2017, the previous day:

Ans.In my answer to one of the earlier questions, I had given an explanation for choosing the year 2044 for inclusion in the Table 3 of Annex.61 (Vol.16).

I have arrived at the population projections for the year 2041 and 2051, and then I have interpolated between these two years, and arrived at the figures corresponding to the year 2044 AD. The requirement of 2044 AD gets reduced, and the 7.56 TMC corresponds to the year 2046 AD. To that extent I stand corrected."

1056. During the cross examination of Shri G. M. Madegowda, the learned Advocate General for the State of Goa raised questions on the reliability of the "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc., from

Malaprabha reservoir" (Volume 16) on the ground that although the report was dated November 2012, the Report included number of letters which were issued in December 2012. The questions Nos. 1 &2 put to Shri Madegowda by the learned Advocate General for the State of Goa and his replies are as under.

> "Q.No.1. Please refer to paragraph 4, page 3, of your Affidavit dated 09.11.2017 (Vol. 207), wherein you have stated that Annex.61, (Vol.16) Exh.KAR-67, was submitted to Chief Engineer, WRDO in November, 2012. In this connection, kindly refer to pages 64, 69, 71(71(a)), 73, 74, 76 (76(a)), 78 (78(a)), 79 (79(a)), 80 (80(a)). All these documents appear to be dated subsequent to the said Report, which you claim to have submitted to the Chief Engineer, WRDO, Bangalore in November, 2012. In this connection I put it to you that:
>
> a. These documents, referred to herein above did not form part of the Report at Vol.16.
> b. These documents have been prepared subsequently, tailor made to suit the Report, and inserted in the Report before it was submitted to this Hon'ble Tribunal on 02.01.2013.
>
> In view of the above, the Report titled as "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc., from Malaprabha reservoir", at Vol. 16, is wholly unreliable and untrustworthy, and cannot be relied upon. What do you have to say?

Ans. There appears to be an apparent mistake in Para 4, at page 3 of my Affidavit. In fact the correct month in which my Report was submitted to the Chief Engineer, WRDO, Bangalore, was December, 2012. I express my apologies for the mistake. The suggestions given in the above question do not subsist in view of my explanation.

Q.No.2. I put it to you that it is apparent from the cover page of the said Report at Vol.16, Exh.KAR-67, (Annex.61), that the Report was prepared in November, 2012 itself. In the light of this, can you please now answer the suggestion put to you in Question No. 1 above?

Ans. The Report was prepared by my subordinate Executive Engineers in November, 2012, and I verified the same during the month of December, 2012. I had a discussion with my subordinate Engineers, and a number of corrections were made in the Office of the Chief Engineer, and finally it was submitted to the Chief Engineer, WRDO, Bangalore, in the month of December, 2012. I may add that at the time of finalisation of the Report in the Office of the Chief Engineer, (my office at that time), certain documents were appended to the Report, which were dated later than the preparation of the Report by the Executive Engineers. It appears that the Report which was finalised in the month of December, 2012, and was so submitted to the Chief Engineer, WRDO, Bangalore in December, 2012, was through an inadvertence, still titled as that of November, 2012. The aforesaid Report was, finally,

submitted by the State of Karnataka before this Hon'ble Tribunal on 02.01.2013."

1057. As noted earlier, in his affidavit dated 9.11.2017, Shri Madegowda has stated that the State Government has improved the water supply infrastructure and at present, the work undertaken, is on 24x7 basis, if Malaprabha dam is augmented by Mahadayi water, to the extent of 7.56 tmc.

1058. The Tribunal must take judicial notice of the fact, that in India, no metropolis or city or town or village gets water on 24x7 basis, either from the State Government or from Municipal Corporation or from Municipality or from Panchayat, as the case may be. Even cities like Delhi, Mumbai, Kolkata, Chennai, Hyderabad, and Bengaluru do not have water supply on 24x7 basis. While efforts for improved management are welcome, a rational and realistic approach for improving the management of drinking water supply with focus on reducing the wastage of water through losses and avoiding malfunctioning of various facilities including pumps etc. is the need of the hour.

1059. The Tribunal notices that the learned Advocate General of the State of Goa put the question No. 4 to Shri G. M.

Madegowda, witness of the State of Karnataka regarding projection of a three time jump in the population of Hubli-Dharwad area. The question No. 4 and the reply thereof are reproduced hereunder.

> "Q.No.4. At Annex.6, (MARK-KA/36), of your Affidavit, you have projected a three time jump in population of the Hubli-Dharwad area. From the said chart, Annex.6 (page 264), it is apparent that the population from 1981 till 2011 increased by about 4 lacs, whereas, as per the calculation at Annex.6, it shows the likely increase of about 18 lacs from 2011 to 2051. I, therefore, put it to you that the figures of estimated population arrived at by the State of Karnataka, Annex.6, are grossly inflated in order to claim more water. What do you have to say?
>
> Ans. I deny the suggestion."

It is found from Table 3.1.1 at page 15 of "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc., from Malaprabha reservoir" (Volume 16) that on the basis of census data, the rate of growth of population per decade was 23% during 1981-1991, 21% during 1991-2001 and 20% during 2001-2011. However, it is apparent from Table 3.1 on page 12 of Volume 16 that for the projection of population of Hubli-Dharwad in the year 2021, 2031, 2041, 2051 and 2061, the State of Karnataka has adopted the rate of growth of population per

decade as 31%, which is not at all justified and the projection of population of Hubli-Dharwad is grossly inflated, leading to a relatively much higher demand for drinking water.

1060. Even if for the sake of arguments, the approach for the projection of future population adopted by the State of Karnataka, is assumed to be acceptable, the Tribunal finds that the assessed demand of drinking water for Hubli-Dharwad twin city for the year 2046 is much lower than what has been projected by the State of Karnataka and indicated in Table 3, page 11 of Volume 16, as is apparent from the following.

1061. The population for the year 2046 is computed by the Tribunal using the projected population of 21,37,878 corresponding to the year 2041 (as given in column 6 of Table 3.1 on page 12 of Volume 16), and applying the rate of increase in population per decade @ 31% as adopted by the State of Karnataka. The projected population of Hubli-Dharwad for the year 2046, thus, works out to be 24,69,249 [21,37,878 + {(5/10) x 0.31 x 21,37,878}]. Water requirement for the population of 24,69,249 @ 135 litres per day works out to be 33,33,48,615 litres per day, i.e., 1,21,67,22,44,475 litres per year. After adding

"Unaccounted for Water" @15% as per Note (ii) under Table 2.1 on page 11 of the Manual on Water Supply and Treatment (MARK-GOA/37), the water requirements for the Hubli-Dharwad twin city for the year 2046 works out to be 1,39,92,30,81,146 litres per year. In view of Note (iii) under Table 2.1, there is no need for making separate provisions for commercial, institutional and minor industries. The water requirement of 1,39,92,30,81,146 litres per year is equal to 139.92 Mcum or equal to 4.94 tmc. On the other hand, the Tribunal finds that the quantum of water required for drinking water purposes for the year 2046 for twin cities of Hubli-Dharwad has been projected as 6.63 tmc by the State of Karnataka at Table 3 on page 11 of Volume 16.

1062. Thus, even if for the sake of arguments, it is assumed that the figures of demand projected by the State of Karnataka in respect of (a) domestic water demand of en-route villages as 0.21 tmc, (b) domestic water demand of Kundagol town as 0.7 tmc, and (c) livestock demand as 0.65 tmc, are correct, the total water demand including en-route villages etc. works out to be 6.5 tmc only, and not 7.56 tmc. Besides, the infrastructure available at

Neerasagar dam reservoir having a total capacity of 40 MLD, can be utilized for meeting the drinking water needs.

1063. Needless to mention, if the future population is estimated on the basis of appropriate approach to be selected out of various approaches for the projection as highlighted in Para 2.2.7 on pages 41-43 of Volume 16, the future need for water requirements for drinking purposes would be far less than even 6.5 tmc.

1064. Thus the Tribunal finds that, the estimation of water needs of 7.56 tmc is on very higher side and is not in accordance with ground realities existing in our country.

Wastage of water through losses

1065. Regarding the wastage of water through losses, the Tribunal finds that a document titled "India: North Karnataka Urban Sector Investment Program (Tranche 2) – Hubli-Dharwad" prepared by Karnataka Urban Infrastructure Development Finance Corporation for the Government of Karnataka, states that in the Hubli-Dharwad urban area 40% of the water supplied

by the water supply network leaks into the ground. In this regard, the question No. 9 was put by the Tribunal to Shri G. M. Madegowda, witness of the State of Karnataka. The question No. 9 and the answer of the same are reproduced hereunder.

> "Q.No.9. A document titled "India: North Karnataka Urban Sector Investment Program (Tranche 2) – Hubli-Dharwad" prepared by Karnataka Urban Infrastructure Development Finance Corporation for the Government of Karnataka has been downloaded from Inter-net. The Document, inter-alia, provides a profile of the sources of water available for Hubli-Dharwad. The Para related to the sources of water i.e., surface water and ground water also includes information related to related to losses. The Para 49 of the said Document on losses are reproduced hereunder:
>
> > "49. Since 1956 Hubli-Dharwad has relied on piped reservoir sources, while the rural areas have increasingly relied on boreholes. Increasing amounts of water are now being abstracted for irrigation in rural areas and many boreholes are now dry or have hard mineral waters which are bad for human health and damage some crops. In the Hubli-Dharwad urban area 40% of the water supplied by the water supply network leaks into the ground. …"
>
> (A copy of the Document titled as India: North Karnataka Urban Sector Investment Program (Tranche2)-Hubli-Dharwad, prepared by Karnataka Urban Infrastructure Development Finance Corporation

for the Government of Karnataka in October,2009, downloaded by this Tribunal from the Internet, has been handed over to the witness and is taken on record and is marked as MARK-38.)

In this regard, please answer the following:

a. Why and how such a huge amount i.e., 40% of the water supplied by the water supply network is being allowed to be wasted through leaks into the ground?
b. With measures to avoid such wastage, the quantum of water required from new sources can be considerably reduced. Why this aspect has not been considered while assessing the water required from new sources?
c. What measures are being taken to avoid such huge wastage of water leaking into the ground?

Ans. I wish to answer this question in 3 parts:

a. The water distribution and the pipelines had been laid very long back. The joints are leaking. The pipes are also aged and incrusted, corroded and as such they are subject to leakage. The Government of Karnataka, fully knowing of this issue, is making all efforts to reduce the water supply losses to the permissible limits, by investing huge amount. The replacement of the defective pipes completely is being envisaged. Already about 1/3rd of the population is covered with 24/7 water supply, and as such the leakage has been reduced considerably.

b. & c. The necessary measures have been taken and are also continued to be taken up to reduce the water losses. The above aspect has been considered, and while assessing the water requirement of the population at 135 LPCD, with 15% UFW (Unaccounted for Water). After the preventive measures are taken and completed, 25% of additional water would be available for distribution to general public. However, the same is within the stipulated limits."

[Emphasis supplied]

1066. While admitting the extent wastage of water through losses, Shri Madegowda has informed the Tribunal that after preventive measures are taken and completed, 25% of additional water would be available for distribution to general public.

1067. From above, it is apparent that with rational assessment of the requirement of drinking water and after taking appropriate measures for proper management of the services, the demand of water for meeting the needs of Hubli-Dharwad twin city for drinking purposes would be drastically reduced.

Alternative Sources for Meeting the Water Needs of Hubli-Dharwad

1068. The Tribunal notices that Shri Chetan Pandit, Expert witness of the State of Goa has mentioned at Para 106 on page 118 of his Affidavit dated 9.9.2016, filed on 12.9.2016 (Volume 192), that there are two major tributaries on the right bank of Malaprabha river, namely Joul Nala and Bennihalla Nala, and a proposal to utilize the waters of Bennihalla Nala was prepared by Mr. Sudheer Sajjan, an engineer of the Water Resources Department of the Government of Karnataka. Shri Pandit also appended a copy of the paper titled "Flood Control and utilization of Water in Bennihalla Basin – A Scientific Proposal by Sudheer Sajjan" as Annexure-D of his Affidavit at pages 146-154 (Volume 192).

1069. The Tribunal notes that the State of Karnataka has not at all considered this aspect while identifying the sources to meet the demand of water for Hubli-Dharwad. In this regard, the learned Senior Counsel of the State of Goa put question Nos. 108 and 109 to Shri A. K. Bajaj, Expert witness for the State of Karnataka. Shri Bajaj stated that it was definitely possible to divert water from both the sources, the present proposal of Government of Karnataka from Mahadayi as well as from Bennihalla after making a detailed study and a DPR for this

diversion. Question Nos. 108 and 109 and the answers thereof are reproduced hereunder:

> "Q.No.108. There are two major tributaries on the right bank of Malaprabha River i.e Joul Nala, and Bennehalla Nalla. The Joul Nalla has a catchment area of 244 sq. kms, and the Bennehalla Nalla has a catchment area of around 5048 sq. kms, which is more than twice the entire Mahadayi basin catchment area. A proposal to utilize the waters of Bennehalla Nalla was prepared by Shri Sudheer Sajjan who is/was an engineer with the Water Resources Department of Government of Karnataka, a copy of the same is marked as Annexure D and is found at Page 146 of Vol. 192 (Additional Affidavit of Examiniation-in-Chief, Shri Chetan Pandit). While answering question QT No.1, you have admitted that you had been provided with the Report submitted by Shri Chetan Pandit, the Expert Witness for the State of Goa. This report has already been produced before this Hon'ble Tribunal initially in July 2016, and thereafter in September 2016, much before you submitted your Affidavit dated 30th December 2016.
>
> In this proposal Mr. Sajjan has estimated the yield of the Benehalla Nala as 10.92 TMC on 75% dependability, of which, as per the same proposal, hardly 1.5 TMC has been put to use.
>
> In view of the aforesaid, can you please state, why in your Report while considering the availability of water for Malaprabha Dam Reservoir, you did not consider this important aspect?

Ans. The document Annexure D at Page 146 of Vol. 192 (Additional Affidavit of Examination-in-Chief, Shri Chetan Pandit) is mentioned as a flood control scheme and as such I did not consider it for the purpose of its water availability. I am also not in a position to say whether it is technically feasible or not to divert this water to the Malaprabha Reservoir.

Q.No.109. Annexure-D, mentioned in the preceding question, deals with and is titled as "Flood Control and Utilization of Water in Bennihalla basin – a Scientific Proposal." The very first line mentions as the Bennihalla, the biggest tributary of the Malaprabha river … .

It is, therefore, not a flood control document, as mentioned by you in your answer, but indeed speaks of utilization of water.

I suppose that you did not consider this important document annexed to the Affidavit of Shri Chetan Pandit which was annexed for the very purpose, served by this document wherein the study made attempts to propose a major diversion scheme for its utilization. Having not adverted to this important document which would have thrown much light on the reasons for the deficit of water, if any, in Malaprabha reservoir as well as the remedy which was available within the Malaprabha basin, your Report falls short of the required level of a study to be presented as an Expert evidence before the Tribunal. What do you wish to say?

Ans. There is no techno-economical feasibility study for diversion of this water from Bennihalla tributary

> and it is for this reason that I did not include in my study the possibility of whether or not this quantity of water or any lesser quantity therefrom can be diverted to the Malaprabha reservoir. The Malaprabha reservoir is receiving approximately 21 TMC of water less than what the reservoir capacity has been designed. It is definitely possible to divert water from both the sources, the present proposal of Government of Karnataka from Mahadayi as well as from Bennihalla after making a detailed study and a DPR for this diversion. I, therefore, deny the suggestion that my Report falls short of the required level of a study."
>
> [Emphasis supplied]

1070. The Tribunal notices that the Plate-1, appended to the "Draft Report on Yield Studies for Mahadayi River Basin by Central water Commission – September 2001" (Volume 33A), shows several west flowing rivers which are entirely in the territory of the State of Karnataka, i.e., rivers originate in the State of Karnataka and outfall in the Arabian Sea. These rivers inter-alia include (a) Kalinadi, (b) Bedti, (c) Aghnashini, (d) Sharavati, (e) Chakranadi, (f) Varahai, (g) Sitanadi, (h) Gurupub and (i) Netravati. Out of these sources the State of Karnataka has examined the possibility of use of water of Kalinadi and Bedti and the same is mentioned at Para 4 on pages 2-4 of "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc.,

from Malaprabha reservoir" (Volume 16). At Para 4 of the above said report, the State of Karnataka has included a comparative study of alternative water sources which include (a) Malaprabha reservoir source at Savadatti, (b) Kali river source at Dandeli, (c) Tungabhadra river source near Muvendi, (d) Almatti dam source, and (e) Bedti nala source and the same is summarized in Table-4 on page 23 of Volume 16. The Table-4 of Volume 16 is reproduced hereunder.

Table 4: Comparison of alternative drinking water supply scheme to Hubli-Dharwad at 2051 AD

Sl. No.	Parameter	Malaprabha Reservoir Source at Savadatti	Kali river Source at Dandeli	Tugabhadra river Sources near Mevundi	Almatti Dam Source	Bedti Naala Source
1	Water quality	Good	Good	Good	Good	Good
2	Quality of water available	Capacity of dam is 38 TMC with a dead storage of 3.3 TMC	Entire quantity is being utilized for power generation at 3 consecutive points i.e., Nagzari, Kodasalli & Kadra	Being enquired	Being enquired	Being enquired
3	Loss due to diversion of water from power generation	Area of cultivation – 14000/TMC Total	Power generation – 50MU/TMC Loss:	Area of cultivation – 14000/TMC Total area –	Area of cultivation – 14000/TMC Total area –	Area of cultivation – 14000/TMC Total area –

	or irrigation purpose to drinking purpose	area – 12.77x14000 = 1,78,780 Ac Loss: 2051: 2350x 1,78,780/10^7 = Rs 42.01 Cr	2051: 12.77x50x 106x3.00 = Rs 191.55 Cr	12.77x14000 = 1,78,780 Ac Loss: 2051: 2350x 1,78,780/10^7 = Rs 42.01 Cr	12.77x14000 = 1,78,780 Ac Loss: 2051: 2350x 1,78,780/10^7 = Rs 42.01 Cr	12.77x14000 = 1,78,780 Ac Loss: 2051: 2350x 1,78,780/10^7 = Rs 42.01 Cr
4	Static + Friction = Total head	136.72 + 87.63 = 224.35 M	318.06 + 89.18 = 407.24 M	192.97 + 133.04 = 326.01M	232.06 + 206.28 = 438.34 M	296.06 + 71.66 = 367.72 M
5	Length of transmission main	50 Km	56 Km	76 Km	122 Km	45 Km
6	Power requirement (KVA)	15700	35300	27000	36300	31700
7	Capital Cost (Present rate)	Rs 372.00 Crores	Rs 464.00 Crores	Rs 540.00 Crores	Rs 800.00 Crores	Rs 660.00 Crores
8	Power charges (Anticipated HESCOM rate at 2051)	Rs 204.76 Crores	Rs 460.38 Crores	Rs 352.13 Crores	Rs 473.42 Crores	Rs 413.43 Crores
9	Annual M&R Cost	Rs 217.82 Crores	Rs 474.16 Crores	Rs 366.17 Crores	Rs 488.91 Crores	Rs 427.13 Crores
10	Water Tariff					
	Domestic	Rs 12.45	Rs 27.09	Rs 20.92	Rs 27.93	Rs 24.40
	Non-Domestic	Rs 24.89	Rs 54.18	Rs 41.84	Rs 55.86	Rs 48.81
	Commercial	Rs 49.78	Rs 108.35	Rs 83.68	Rs 111.73	Rs 97.62

The State of Karnataka has concluded as under.

> "Hence, among all the four sources, Malaprabha dam sources has the lowest capital cost, minimum power requirement, least expenditure on operation and

> maintenance and lowest water tariff. Hence, it may be concluded that Malaprabha reservoir source is the most feasible source in all respects for meeting the drinking water demand of Hubli-Dharwad and surrounding towns / villages."

1071. This aspect was also included in the written arguments of the learned Counsel of the State of Karnataka. At Para 5.37, pages 146-151of the written arguments (Volume 220), the Learned Counsel of State of Karnataka mentioned about the scientific study in respect of alternative water resources to meet the drinking water requirement of Hubli-Dharwad etc. He has quoted from EXH. KAR 67 (Volume 16) wherein it has been concluded as under.

> "Hence, among all the four sources, Malaprabha dam source has the lowest capital cost, minimum power requirement, least expenditure on operation and Maintenance lowest water tariff. Hence, it may be concluded that Malaprabha reservoir source is the most feasible source in all respects for meeting the drinking water demand of Hubli-Dharwad and surrounding towns / villages."

However, the Tribunal notes that from critical examination of the details provided in Volume 16, it is apparent that the comparison was not based on full facts. For the purpose of estimation of the cost etc. of proposal for supply of water from

Malaprabha reservoir, the cost of works related to various structures planned for diversion of water from Mahadayi basin to Malaprabha basin are not considered at all while making the comparison, making the whole exercise futile and meaningless. Accordingly, the learned counsel was asked to clarify. The reply of the learned Counsel of the State of Karnataka at Para 16.2 on page 29 (Volume 231) is as under.

> "The State of Karnataka submits that these issues of cost etc., do not constitute water dispute as the State of Goa would not suffer any injury and moreover the State of Goa itself withdrawn such averments made in para 28(iv) and 28(v) of its complaint. The State of Karnataka submits that it requires two weeks' time to file information as sought. The State of Karnataka clarifies accordingly."

The clarifications offered by the learned Counsel of the State of Karnataka are far from satisfactory.

1072. The Tribunal notes that the State of Karnataka has made the comparison between five sources, namely (a) Malaprabha reservoir source, (b) Kali river sources, (c) Tungabhadra river source, (d) Almatti reservoir source, and (e) Bedti Nala source. The comparison has been made to justify as to

why diversion from Mahadayi river basin to Malaprabha reservoir is a better option. Apart from the gross error in the comparison, wherein the cost of creating facilities for diversion of water from Mahadayi river basin to Malaprabha river have not been taken into consideration, another important aspect that has not at all been explained properly by the State of Karnataka or by any of the witnesses produced by the State of Karnataka relates to water of Malaprabha reservoir itself being a source.

1073. It is apparent that water of Malaprabha reservoir is presently being utilized for meeting the demand of drinking water of Hubli-Dharwad since 1983. From Table 2 on page 10 of Volume 16, it is apparent that:

a. After commissioning of Malaprabha dam Stage-I, 34 MLD or 12.41 Mcum per year or 0.44 tmc per year of water is being supplied for Hubli-Dharwad since 1983;
b. After commissioning of Malaprabha dam Stage-II in 1993, additional 34 MLD or 12.41 Mcum per year or 0.44 tmc per year of water is being supplied for Hubli-Dharwad, making a total of 68 MLD or 24.82 Mcum per year or 0.88 tmc since 1993;

c. After emergency improvements to Malaprabha Stage – I & II in the year 2004, the total capacity for supply of water to Hubli-Dharwad was increased from 68 MLD to 73.8 MLD, resulting in supply of 26.9 Mcum per year or 0.95 tmc per year to Hubli-Dharwad twin city from Malaprabha reservoir.
d. After commissioning of Malaprabha dam Stage-III, phase I in the year 2011, additional 80 MLD is being supplied from the Malaprabha reservoir making a total of 153.8 MLD or 56.14 Mcum per year or 1.98 tmc per year.

1074. The aspects relating to 1.98 tmc of water of Malaprabha reservoir being released to meet the drinking water requirement of Hubli-Dharwad twin city has also been stated by Shri G. M. Madegowda, witness of the State of Karnataka in reply to question No. 3 put to him by the Tribunal. The question No. 3 and the reply thereof are reproduced hereunder.

> Q.No.3. At Para 11, pages 9-10 of your Affidavit dated 9.11.2017 (Vol. 207), you have inter-alia stated as under:
>
> "The Govt. has approved the "Karnataka Urban Water Sector Improvement Project Upscaling 24x7 continuous Water Supply to cover entire corporation of Hubli-Dharwad" at an estimated cost of Rs. 1,14,600.00 lakhs. The work under the project is in progress through

Karnataka Urban Infrastructure Development and Finance Corporation which on completion would provide infrastructure for 24x7 continuous water supply of 5.20 tmc drawn from Malaprabha dam (subject to allocation by this Hon'ble Tribunal)"

In this regard, please answer the following:

a. Why the "Karnataka Urban Water Sector Improvement Project Upscaling 24x7 continuous Water Supply to cover entire corporation of Hubli-Dharwad" has been planned for 5.2 tmc?
b. How a project can be approved and work on the same started by the State Government with a rider "subject to allocation by this Hon'ble Tribunal"?
c. Why the scheme has been prepared and approved without identifying reliable and confirmed sources of water?

Ans. I wish to answer the question in three parts:

a. It is planned to provide assured and pressurized continuous water supply to Hubli-Dharwad Corporation area to a projected population of the year 2041. The 5.2 TMC of water required for that purpose has been planned by the Consultants of Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC).
b. The aforesaid decision has been taken by the State Government of Karnataka as a policy decision.
c. <u>It is the existing source where the Municipal Corporation is already drawing 1.98 TMC per year. The future planning has been done in anticipation</u>

> of this Hon'ble Tribunal allotting water to the State of Karnataka.
>
> [Emphasis supplied]

1075. Further, the Table 2 on page 10 of Volume 16 indicates that with completion of Malaprabha dam stage III, phase II in the year 2021, additional 68 MLD i.e., 24.82 Mcum per year or 0.88 tmc per year of water of Malaprabha would be available for meeting the need of drinking water for Hubli-Dharwad twin city.

1076. From above, it is apparent that Malaprabha reservoir is, in fact, more than adequate / sufficient existing source of water for meeting the drinking water needs of the Hubli-Dharwad twin city with supply of 1.98 tmc of water and that by the year 2021, the total supply of water from Malaprabha reservoir is envisaged to be about 2.86 tmc.

1077. It is a matter of concern that these facts have not been truthfully reflected in the pleadings of the State of Karnataka nor these facts were taken into consideration while modifying the detailed project report of Malaprabha project in the year 2009. The Tribunal notes that in the said modified DPR,

the reasons as to why only 0.201 tmc, towards drinking water purposes mentioned in the Salient Features at pages 15 to 35 of the "Modified Detailed Project Report of Malaprabha Project" (Volume 33B) of the year 2009 is made, have not been explained by the State of Karnataka despite the fact that: (a) drinking water supply was the first priority as per the National Water Policy 2002 as well as the Karnataka State Water Policy 2002; and (b) 0.95 tmc of water from Malaprabha reservoir was being supplied for meeting the drinking water requirements of the twin city of Hubli-Dharwad since 2004. The only explanation offered by the State of Karnataka in para 13.13 of its Statement of Claims (Volume 10) is that further augmenting supplies from the Malaprabha Schme are impossible, as the farmers of Malaprabha command are threatening to blow up the pipes.

The Tribunal is of the opinion that blowing of the pipes by farmers of Malaprabha command is a problem relating to law and order, to be maintained by the State of Karnataka. Merely because the State of Karnataka is not in a position to handle law and order situation prevailing in Malaprabha command, as is admitted by it, it is not justified in laying its hands on waters of inter-State River Mahadayi. In fact, making of such a statement

on oath is shocking, disgraceful , disgusting, frightful, horrifying, nauseating, repulsive, sickening and scandalous. The failure to maintain law and order situation by the State of Karnataka in Malaprabha command area shows inefficiency of the State of Karnataka to rule the State and on this specious plea, diversion of water of inter-State River Mahadayi can never be granted by the Tribunal, to meet drinking needs of the Hubli-Dharwad and en-route villages.

1078. In this regard, the answer of Shri A. K. Bajaj, the Expert witness of the State of Karnataka to the question No. 74 put to him by the learned Senior Counsel for the State of Goa is quite relevant. Shri Bajaj stated that at the time of preparing a revised Project Report of an already ongoing project, generally, the existing usages had to be protected. The question No. 74 and reply thereof are reproduced hereunder.

> "Q.No.74. In your Affidavit in Evidence as well as in the Report dated 30.12.2016 (Vol.194), page 14, para 9, you have stated that, as per National Water Policy, the drinking water needs has the highest priority. Similarly, in answer to question No.71 as well, you have stated that drinking water needs have the highest priority as per the National Water Policy. I draw your attention to Vol.33 (B) i.e. the Modified Detailed Project Report of Malaprabha Project, submitted by State of Karnataka on

18.03.2013, more particularly, at page 17 wherein allocation is made for water supply and industrial purpose as per the revised Project Report.

From the said Report it is evident that as per the revised Project Report, the total allocation of water for industrial and drinking water taken together is 0.216 TMC out of the total of 27 TMC.

According to you, is this allocation of only 0.216 TMC in accordance with the National Water Policy which you claim to give highest priority to the drinking water?

Ans. At the time of preparing a revised Project Report of an already ongoing project, generally, the existing usages have to be protected. It is probably on this basis that the allocation have been apportioned. I am not in a position to say as to why or what were the conditions in the command area due to which the Government of Karnataka has given the quantities for the purposes as mentioned in the Vol. 33(B) at page 17. Based on the information contained in the Volume 33(B) at page 17, I am not in a position to say whether the allocations are justified or not."

[Emphasis supplied]

1079. Shri Bajaj, however, has failed to explain as to why the existing usage of water in respect of drinking water, which despite being top-most priority, in the National Water Policy as well as in the State Water Policy, is / was not protected.

Further, in reply to part (d) of the question No. 14 put to Shri Bajaj by the Tribunal, he stated as under.

> "I am not aware why the DPR approved in 2009 did not make more provision for drinking water in the Report. The requirements depend on the population of the area and it is possible that the provisions made in the then DPR would have met the drinking water requirements."
>
> [Emphasis supplied]

1080. If the State of Karnataka feels and is of the opinion that there is shortage of drinking water in Hubli-Dharwad twin city and that 7.56 tmc of water is essentially required for this purpose, it is always open to the State of Karnataka to modify the detailed project report of Malaprabha project, last modified in the year 2009. There is neither any legal bar, nor is there prohibition of any kind, operating against the State of Karnataka from further modifying the modified detailed project report of Malaprabha and making a provision that 7.56 tmc of water would be made available to the twin city and other villages.

1081. From perusal of Para 1.2 – History (Earlier Proposal) of the Section 3 of the "Modified Detailed Project Report of Malaprabha Project" (Volume 33B), it is apparent that the Malaprabha project was initially planned in the year 1961 and the

same was cleared by the Planning Commission in the year 1963. Subsequently, the DPR of Malaprabha project was modified in the year 1967 and the same was approved by the Government of Karnataka in the year 1969. Thereafter, the DPR was again modified in the year 1979 and was approved by the Government of Karnataka in the year 1980. As per information available with the Tribunal, the DPR of Malaprabha project was last modified in the year 1999. It is also noted that with each modification, additional new works were included in the project either in the form of new canal system or extension of canal system or increase in the command area. Obviously, this has given rise to hopes to the people of the command area and to the farmers in particular. With the revision of the water availability on a lower side at a later date, the water for supply was bound to become deficient for meeting the demands which were planned with higher assessment of water availability. Such a scenario is akin to giving false hopes to the people of the area.

1082. As a matter of fact, the changes in water utilization pattern i.e., allocation of more water to drinking purposes with introduction of efficient use of water, particularly for irrigation,

can be done without any elaborate exercise of re-designing of the facilities for which cost will be minimal.

1083. From the perusal of "Modified Detailed Project Report of Malaprabha Project" (Volume 33B), it is apparent that following aspects have not been considered while modifying the DPR in the year 2009.

a. Adequate provisions were not made for the drinking water needs although the same has got top most priority.

b. The ground water resources of the Malaprabha basin and Malaprabha command were not duly considered for planning purposes despite availability of ground water as is apparent from the statement of State of Karnataka at para 5.130A of "Reply on behalf of State of Karnataka (as amended pursuant to the Order dated 15.4.2015 passed by the Hon'ble Tribunal) to the Amended Statement of Case of Goa dated 23.04.2015" (Volume 138) that "the sugarcane cultivation in Malaprabha basin in Karnataka has increased by conjunctive utilisation of surface water drawn from the canals or river lifts and ground water".

1084. The use of ground water for sugarcane cultivation instead of using these important resources for meeting the drinking water and other needs of the people of the area, is not at all logical. The appropriate approach is to undertake planning

for conjunctive use of surface and ground water resources for the benefit of the people in larger perspective.

1085. The Tribunal notices that in its judgement rendered in case of the State of Karnataka and Ors. Vs. State of Tamil Nadu and Ors., reported in (2018)4 SCC 1, the Hon'ble Supreme Court has highlighted the conjunctive use of surface and ground water resources. The Hon'ble Supreme Court has observed that the recharge of ground water is principally from rainfall as well as artificial modes, namely, application of water to irrigate crops, flooding of areas caused by overflowing of streams to their sites and seepage from unlined canals, tanks and other sources. The relevant Para from the judgment of the Hon'ble Supreme Court is reproduced hereunder.

> "426. While exploring the possibility of ground water as an additional source to be conjunctively used along with the surface flow of river Cauvery, the factual matrix reveals, based on empirical data, that the contributions thereto are from surface water through infiltration into the ground by way of natural recharge, stream flow, lakes and reservoirs. The recharge of ground water is principally from rainfall as well as artificial modes, namely, application of water to irrigate crops, flooding of areas caused by overflowing of streams to their sites and seepage from unlined canals, tanks and other sources. …"

The Hon'ble Supreme Court after taking into consideration the above stated principles has concluded that the available ground water can be accounted for in finally determining the apportionment of the share of the otherwise deficit Cauvery basin. The relevant portion of para 428 from the judgment of the Supreme Court is reproduced hereunder.

> "… However, in the attendant facts and circumstances, in view of the studied scrutiny of all pertinent facets of the issue by balancing all factors, we are of the unhesitant opinion that at least 10 TMC of ground water available in the Delta areas of Tamil Nadu can be accounted for in finally determining the apportionment of the share of the otherwise deficit Cauvery basin without touching the yield of 740 TMC."

The Hon'ble Supreme Court has further stated as under.

> "429. To recall, the national policies discussed above, do not, as such, debar the conjunctive use of ground water, the only caveat being periodical assessment on a scientific basis thereof and to guard against exploitation of the said resource so as not to exceed the recharging possibilities. …"

1086. The State of Karnataka is being assisted by a competent team of highly qualified Engineers, highly knowledgeable Planners, highly skillful Technicians, etc. and they

must have given thought to the question as to whether the modified DPR of Malaprabha project can be further modified, to enable the State of Karnataka to provide 7.56 tmc of water for drinking purposes to the twin city and other villages, as according to the State of Karnataka, they are water starved, even after duly considering the available water resources – surface water as well as ground water. However, no attempt has been made by anyone to modify the DPR of Malaprabha project for supplying further quantity of water to the twin city and other villages, which in turn, shows the hollowness of the claim of the State of Karnataka, that it should be permitted to divert 7.56 tmc of water from Mahadayi river. The reason for not making such an attempt is not far to seek and the reason is that, in fact, there is no scarcity of drinking water in Hubli-Dharwad twin city and other villages. Even if the State of Karnataka is of the opinion that 7.56 tmc of water is actually not needed to meet the drinking water needs of the twin city and other villages, it is always open to it to decide that a small quantity of water, say 2.0 tmc or so should be provided exclusively for drinking water to the twin city and other villages, and the State of Karnataka can do so by modifying the modified DPR of Malaprabha project. Absence of such an exercise on the specious and lame excuse as provided by Shri Bajaj, in

answer to question No. 74 put to him to the effect that at the time of preparing a revised Project Report of an already ongoing project, generally, the existing uses have to be protected, has no legs to stand and cannot be accepted by the Tribunal at all. All the DPRs are always prepared for the benefit of the public and not for the satisfaction of the Planners, Engineers, Technical Team, etc. As and when an occasion arises, the DPR can always be modified to meet the different needs of the citizens residing in the State of Karnataka. Shri Bajaj could not produce any scientific literature or any standard book, in which it is laid down that, at the time of preparing a revised Project Report, generally, the existing uses have to be protected. Therefore, such a bald assertion made by Shri Bajaj, which has no factual foundation, can hardly provide any justification to the State of Karnataka from modifying the modified DPR of Malaprabha project, to ensure that sufficient quantity of drinking water is made available to the twin city and en-route villages. By not doing so, the State of Karnataka has violated, fundamental rights of citizens residing in the twin city and other villages, guaranteed under Article 21 of the Constitution as right to receive drinking water is one of the important concomitants of right to life, which is protected under the said Article.

1087. This aspect of the matter has neither been addressed by the State of Karnataka, nor by any of the witnesses examined on behalf of the State of Karnataka. Having regard to the facts of the case, the Tribunal concludes that by modifying the modified DPR of Malaprabha project, the demand for diversion of water from Mahadayi river for meeting the drinking needs of twin city and other villages, would not survive at all.

1088. From above, it is apparent that the State of Karnataka has not explored and examined all possible options in the right perspective.

1089. Further, it is apparent that the "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc., from Malaprabha reservoir" (Volume 16) has several inconsistencies.

1090. From the examination of the detailed project report (DPRs) and revised DPRs of Kalasa Nalla and Bhandura Nalla projects (Volume 17&18, Volume 19, Volume 20 and Volume 21) filed by the State of Karnataka, it is found by the Tribunal that, none of the DPRs have been prepared in accordance with the "Guidelines for Preparation of Detailed Project Report of

Irrigation and Multipurpose Projects" (MARK-5). Specific aspects required to be included in the detailed project reports (DPRs) and to be checked are clearly specified in Section I – Check List at pages 1 to 17 of the "Guidelines for Preparation of Detailed Project Report of the Irrigation and Multipurpose Projects" (MARK-5) under major heads namely, (i) General Data, (ii) Planning, (iii) Interstate and International Aspects, (iv) Surveys, (v) Geological Investigations, (vi) Seismic Investigations, (vii) Foundation Investigations, (viii) Construction Material Surveys, (ix) Hydrological and Meteorological Investigations, (x) Hydrology, (xi) Land Acquisition and Resettlement of Oustees, (xii) Designs, (xiii) Irrigation and Command Area Development, (xiv) Flood Control and Drainage, (xv) Navigation, (xvi) Power, (xvii) Construction Programme and Plant and Manpower Planning, (xviii) Foreign Exchange, (xix) Financial Resources, (xx) Estimate, (xxi) Revenue, (xxii) B. C. Ratio, (xxiii) Ecological Aspects, (xxiv) Colonies and Buildings, (xxv) Public Participation and Cooperation, and (xxvi) Soil Conservation.

1091. The DPRs filed by the State of Karnataka are mostly devoted to preparation of estimates of the projects. The aspects of planning, particularly the ecological aspects have not been

addressed in proper perspective. This is more so as the scheme involves inter-State issues and the diversion of water from one river basin to another and the schemes are required to be implemented in forest areas.

1092. The Tribunal is of the firm view that the reports filed by the State of Karnataka as the DPRs or the revised DPRs cannot be termed as the detailed project reports in true sense and on this count alone, the proposal of the State of Karnataka deserves to be rejected.

1093. Though the DPR of 2000 (Volume 18) and DPR of 2010 (Volume 19) of Kalasa Nala Diversion Scheme and DPR of 2000 (Volume 20) and DPR of 2012 (Volume 21) of Bhandura Nala Diversion Scheme do not provide requisite details and cannot be termed as detailed project report in true sense, a comparison of the information included in reports indicates visible change in respect of purpose of the projects.

DPR of 2000 and DPR of 2010 of Kalasa Nala Diversion Scheme

1094. Second and third paras from the General Report at page 2 of the "Detailed Project Report (Kalasa DPR-2000) of

Kalasa Nala Diversion Scheme prepared in 2000" (Volume 18) filed by the State of Karnataka are reproduced hereunder.

> "It is observed since 1972 that the reservoir is not getting contemplated 75% dependable yield on account of dwindling of rainfall and lifting of water by villagers on upstream side of catchment area.
>
> With a result it has not been possible to supply water fully to the notified area for Kharif and Rabi etc., This has given an impetus to augment the Malaprabha Reservoir by diverting West flowing Kalasa and Haltara nalas in Khanapur taluk. It is proposed to divert 3.56 TMC of water from the above nallas to the Malaprabha river."
>
> [Emphasis supplied]

From above, it is apparent that the purpose of the project is to augment the Malaprabha reservoir with the objective to supply water fully to the notified areas of Kharif and Rabi etc. It is apparently, in this background that the purpose of the project in the salient features at page 7 of Volume 18 is indicated as "To augment the storage of Malaprabha Reservoir", without any mention at all that the water so diverted would be used for drinking purposes.

1095. Relevant extract from the General Report at page 1 of the "Detailed Project Report (Kalasa DPR-2010) of Kalasa Nala Diversion Scheme prepared in 2010" (Volume 19) filed by the State of Karnataka are reproduced hereunder.

> "It is observed since 1972 that the reservoir is not getting contemplated 75% dependable yield on account of dwindling of rainfall and lifting of water by villagers on upstream side of catchment area. <u>With a result it has not been possible to supply water fully to the notified area for Kharif and Rabi etc.</u>, This has given an impetus to augment the Malaprabha reservoir by diverting west flowing Kalasa and Haltara nalas in Khanapur Taluk. It is proposed to divert 3.56 TMC of water from the above nalas to the Malaprabha river.
>
> [Emphasis supplied]

From above, it is apparent that the purpose is to augment waters of Malaprabha reservoir to supply water fully to the notified area for Kahrif and Rabi etc. In the General Report at pages 1 to 10, there is no mention about the use of diverted water for drinking purposes. However, the purpose indicated in the Salient Features at page 12 of Volume 19 is indicated as "To augment the storage of Malaprabha reservoir to meet the drinking water requirements of Hubli-Dharwad city, other towns and villages of Malaprabha basin". The purpose of the project

indicated in the "Salient Features" is different from what emerges from the "General Report".

DPR of 2000 and DPR of 2012 of Bahndura Nala Diversion Scheme

1096. DPR of 2000 and DPR of 2012 of the Bhandura Nala Diversion Scheme also present similar varying statements. Relevant extract from the General Report at page 4 of the "Detailed Project Report (Bhandura DPR-2000) of Bhandura Nala Diversion Scheme prepared in 2000" (Volume 20) filed by the State of Karnataka is reproduced hereunder.

> "As observed, the Malaprabha reservoir is not getting contemplated yield on account of dwindling rainfall and lifting of water by villagers on upstream side of dam with a result it has not been possible to supply water fully to notified area. Hence, it has be-come necessary to augment Malaprabha reservoir by diverting west flowing nalas to Malaprabha. Hence, the implementation of the project is essential to overcome the deficit of water in Malaprabha Dam".
>
> [Emphasis supplied]

It is apparent that the purpose of the project is to augment the Malaprabha reservoir with the objective to supply water fully to the notified areas of Kharif and Rabi etc. It is apparently, in this background that the purpose of the project in the salient features

at page 6 of Volume 20 is indicated as "To augment the storage of Malaprabha reservoir", without any mention at all that the water so diverted would be used for drinking purposes.

1097. Relevant extract from the General Report at page 1 of the "Detailed Project Report (Bhandura DPR-2012) of Bhandura Nala Diversion Scheme prepared in 2012" (Volume 21) filed by the State of Karnataka is reproduced hereunder.

> "In view of the reduction in the flow of Malaprabha River at the dam site, the meeting of drinking water needs of Hubli & Dharwad city and surrounding villages has become a difficult task. The drinking water supply to twin cities has been met once in 10 days. Hence Karnataka planned to divert a small quantity of 7.56 TMC of its Mahadayi basin contribution to Malaprabha reservoir, so as to meet the drinking water requirements of Hubli & Dharwad city, other towns and villages of Malaptabha Basin by planning Kalasa Nala and Bhandur Nala Diversion Schemes."

The Tribunal notes a sudden change in the purpose of the projects in the year 2012. As per "Detailed Project Report (Bhandura DPR-2000) of Bhandura Nala Diversion Scheme prepared in 2000" (Volume 20), the purpose of the project was to augment the Malaprabha reservoir with the objective to supply water fully to the notified areas of Kharif and Rabi etc. However,

as per “Detailed Project Report (Bhandura DPR-2012) of Bhandura Nala Diversion Scheme prepared in 2012” (Volume 21), the purpose is to augment the storage of Malaprabha reservoir to meet the drinking water requirements of Hubli-Dharwad city, other towns and villages of Malaprabha basin. In the General Report of the DPR of Bhandura Nala of 2012 (Volume21), it is also mentioned that Karnataka planned to divert a small quantity of 7.56 TMC of its Mahadayi basin contribution to Malaprabha reservoir, so as to meet the drinking water requirements of Hubli & Dharwad city, other towns and villages of Malaprabha Basin by planning Kalasa Nala and Bhandura Nala Diversion Schemes. However, the Tribunal notes that from the General Report of the DPR of 2010 of the Kalasa Nala (Volume 19), it is apparent that the purpose is to augment waters of Malaprabha reservoir to supply water fully to the notified area for Kharif and Rabi etc. The Tribunal notices that in the General Report at pages 1 to 10 of the DPR of 2010 of Kalasa Nala (Volume 19), there is no mention at all, about the diversion of 7.56 tmc of water for drinking purposes.

1098. From the above, it is apparent that the purpose of the two projects continued to be to augment the water of

Malaprabha reservoir to supply water fully to the notified area for Kahrif and Rabi etc. i.e., the purpose was simply to provide water for irrigation.

1099. The fact that the purpose of the two schemes namely Kalasa Nala Diversion Scheme and Bhandura Nala Diversion Scheme is to augment waters of Malaprabha reservoir for irrigation, is also evident from the "Recommendations of the Forest Advisory Committee (FAC) in its meeting held on 28-8-2003". The State of Karnataka has made available a copy of the letter No. 16-90/2017-FC dated 25th October 2017 of the Ministry of Environment, Forests and Climate Change as Enclosure-A2 (Colly) at pages 179 to 181 of the "Written Submissions on behalf of State of Karnataka" (Volume 220). Relevant extract from "Recommendations of the Forest Advisory Committee (FAC) in its meeting held on 28-8-2003" is reproduced hereunder.

> "The proposal was discussed by the Forest Advisory Committee (FAC) in detail. Managing Director of the User Agency has also presented the case before FAC. After <u>careful examination of the proposal and considering the irrigation requirement of Hubli and Dharwad districts,</u> the Committee recommends the diversion of 258.00 ha. of forestland for construction of Kalasa Nala Diversion Scheme …"
>
> [Emphasis supplied]

> "The proposal was discussed by the Forest Advisory Committee (FAC) in detail. Managing Director of the User Agency has also presented the case before FAC. After careful examination of the proposal and considering the irrigation requirement of Hubli and Dharwad districts, the Committee recommends the diversion of 243 ha. of forestland for construction of Bhandura Nala Diversion Scheme …"
>
> [Emphasis supplied]

It is quite clear that the purpose of the two schemes was to augment the water of Malaprabha reservoir for irrigation only.

1100. In this regard, the observation of Shri G. M. Madegowda, witness on behalf of the State of Karnataka at Para 14 on pages 11 to 13 and Para 16 on page 14 of his Affidavit dated 9.11.2017 (Volume 207) are also quite relevant. Relevant extract from Para 14 of the Affidavit of Shri Madegowda is reproduced hereunder.

> "14. Ever since the project for drawal of water from Malaprabha dam was commenced, there have been conflicts between irrigation demand and drinking water supply more particularly during summer months. The water level in the dam would fall so low from February to June, the drawl of water for drinking water supply would become contentious between City Corporation and the farmers. The farmers of Malaprabha command,

> farmer organisations and Kannada cultural organisations would resort to protests. The general public of the city have resorted to dharnas, bundhs, strikes, disrupting the public transport system, etc. This has resulted in drinking water supply getting disrupted. The newspaper clippings reveal about the demonstrations, dharnas, hunger strike sit-ins and city bundhs, occasionally even leading to stoppage of pumping system and water treatment plants, have been resorted to by the farmers against the drawal of water from the dam. On occasions, the protestors including farmers have addressed representations to the Police Commissioner of Hubli-Dharwad City. Anticipating the law and order trouble, the Chief Engineer, Karnataka Urban Water Supply and Drainage Board has addressed the Police Commissioner for providing security to the water supply and treatment installations at the Malaprabha dam and en-route infrastructure. …"

From the above, it is apparent that the shortage of irrigation water is the major issue and that the diversion schemes are primarily planned to address the shortage of irrigation water in the command of the Malaprabha project. This becomes amply clear from the Statement of Shri Madegowda at Para 16 of his Affidavit (Volume 207), wherein he has stated that "the diversion from Mahadayi is necessary to relieve the burden on the existing water of Malaprabha dam, which is required for meeting the

requirements of command areas, etc.”. This aspect has been examined at Para 1053.

From the foregoing paras, it is evident that the main objective of the diversion schemes is to augment the water of the Malaprabha reservoir to address the shortfall in the irrigation water required for the notified areas of Kharif and Rabi etc.

Misplaced Priorities

1101. The “Modified Detailed Project Report of Malaprabha Project” (Volume 33B) prepared in 2009 and filed by the State of Karnataka, inter-alia, includes information about the different uses of water planned in the earlier DPR approved in 1963 by the Planning Commission for gross utilization of 37.2 tmc and that in the proposed modified DPR of 2009. From Section 2, Salient Features on pages 18 and 19, it is apparent that no provision was made in the earlier approved Project Report of 1963 in respect of domestic water supply at all. However, in the “Modified Detailed Project Report of Malaprabha Project”, a provision of 0.201 tmc only is made towards domestic water supply for “Hubli-Dharwad, Bailhogal, Savadatti and other 14 villages of Savadatti Tq”.

1102. The Tribunal finds that no explanation / reason is offered by the State of Karnataka or any of the witnesses examined by it as to why, provision of 0.201 tmc of water only is indicated towards domestic water supply for Hubli-Dharwad, Bailhogal, Savadatti and other 14 villages of Savadatti Taluk in the salient features at pages 15-35 of the revised DPR of 2009 (Volume 33B). In fact, if Hubli-Dharwad and other villages are water-starved, for domestic water use, adequate and appropriate provision for supply of water for domestic use should have been made and can be made even to-day in the revised DPR of Malaprabha Project. In the said revised project itself, the State of Karnataka should have earmarked 7.56 tmc of water and can be earmarked presently for Hubli-Dharwad and other villages. Admittedly, this was not done by the State of Karnataka and therefore, its claim that 7.56 tmc of water is needed for meeting drinking and other domestic requirements of twin cities of Hubli-Dharwad and other villages becomes, highly unsustainable.

1103. At the time of modification of the DPR of Malaprabha Project in 2009, the National Water Policy 2002 and the State

Water Policy 2002 of the State of Karnataka were already in place. In both the policies, i.e., the National Water Policy as well the State Water Policy, drinking water is mentioned at first place in the list of water allocation priority. The National Water Policy was revised in the year 2012. In Clause 1.3(vi) of the National Water Policy of 2012, it is stated that safe water for drinking and sanitation should be considered as pre-emptive needs, followed by high priority allocation for other basic domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco-system needs. Thus, drinking water continues to be the first priority even in the National Water Policy of 2012. What is necessary to notice, is that a National Water Policy is finalized in the meeting of National Water Resources Council, which is presided over by the Hon'ble Prime Minister.

1104. The reasons for not indicating the provisions for drinking water purposes in the Salient Features at pages 15 to 35 of the "Modified Detailed Project Report of Malaprabha Project" (Volume 16) of the year 2009 have not been explained despite the fact that: (a) drinking water supply is the first priority as per the National water Policy 2002 as well as the Karnataka State

Water Policy 2002; and (b) 0.95 tmc of water from Malaprabha reservoir is being supplied for meeting the drinking water requirements of the twin city of Hubli-Dharwad.

1105. Question No. 74 put to Shri A. K. Bajaj, Expert Witness of the State of Karnataka by the learned Senior Counsel for the State of Goa on 14.9.2017 and the reply thereof are reproduced hereunder.

> "Q.No.74. In your Affidavit in Evidence as well as in the Report dated 30.12.2016 (Vol.194), page 14, Para 9, you have stated that, as per National Water Policy, the drinking water needs has the highest priority. Similarly, in answer to question No.71 as well, you have stated that drinking water needs have the highest priority as per the National Water Policy. I draw your attention to Vol.33 (B) i.e. the Modified Detailed Project Report of Malaprabha Project, submitted by State of Karnataka on 18.03.2013, more particularly, at page 17 wherein allocation is made for water supply and industrial purpose as per the revised Project Report.
>
> From the said Report it is evident that as per the revised Project Report, the total allocation of water for industrial and drinking water, taken together is 0.216 TMC out of the total of 27 TMC.
>
> According to you, is this allocation of only 0.216 TMC in accordance with the National Water Policy which you claim to give highest priority to the drinking water?

> Ans. At the time of preparing a revised Project Report of an already ongoing project, generally, the existing usages have to be protected. It is probably on this basis that the allocation have been apportioned. I am not in a position to say as to why or what were the conditions in the command area due to which the Government of Karnataka has given the quantities for the purposes as mentioned in the Vol. 33(B) at page 17. Based on the information contained in the Volume 33(B) at page 17, I am not in a position to say whether the allocations are justified or not."

1106. It is however, noted that at page 135 of the "Modified Detailed Project Report of Malaprabha Project" (Volume 33B), a Note on Working Table is given. In this Note, the following has been stated in respect of requirements of drinking water supply for twin cities of Hubli-Dharwad. The relevant extract is as under:

> "…
> The requirement of Drinking water supply of 90 MCft monthly for Twin cities of Hubli-Dharwad has been provided from the year 1982-83. Thus under Col. No. 7 of working table issues for irrigation and drinking is shown as 25340 MCft annually (24260 for irrigation + 1080 MCft (90 MCft X 12 months)). As regards, to issues for water other requirements on the downstream of dam under Col. No. 8 is actual yearly issues during the year 1973-74 to 2005-06. This requirement is however not accounted for utilization under Malaprabha Project. This drinking water requirement for Twin cities of Hubli-

Dharwad which is lifted directly from reservoir as duly considered for utilization under Malaprabha Project."

1107. From above, it is safe to conclude that although there is no specific mention about the provision for drinking water supply to twin city of Hubli-Dharwad from the Malaprabha reservoir in the Table indicating Salient Features of the "Modified Detailed Project Report of Malaprabha Project" (Volume 33B), a provision of 1.08 tmc (1080 million cubic feet) has been duly accounted for drinking water supply for twin city of Hubli-Dharwad from the Malaprabha reservoir.

Inefficient Use of Irrigation Water

1108. The State of Goa in its pleading has mentioned at Para 174, page 198 of the Statement of Case of the State of Goa (Volume 131) 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 and that in reality, the purpose is to utilize the waters from the Malaprabha basin entirely and excessively for irrigation purposes, particularly for

cash rich crops like, sugar cane. The State of Goa has further stated that the area under sugarcane cultivation and the sugar production in the Malaprabha basin from the years 1972 – 2013 has drastically increased. It is stated at Para 174(i) of the Statement of Case of the State of Goa (Volume 131) that the area under sugarcane cultivation in the said basin for the year 1979-80 was 224 hectares and it has risen to 2756 hectares in the year 2012-13, which is an increase by more than 12 times. Para 174(i) of the Statement of Case of the State of Goa (Volume 131) is reproduced hereunder.

> "174. (i) 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. For instance, the area under sugarcane cultivation in the said basin for the year 1979-80 was 224 hectares. It has risen to 2756 hectares in the year 2012-13, which is an increase by more than 12 times."

1109. The State of Karnataka, in the "Reply on behalf of the State of Karnataka (as amended pursuant to the Order dated 15.4.2015 passed by the Hon'ble Tribunal) to the Amended Statement of Case of Goa dated 23.4.2015" (Volume 131) has stated that the contents of Para 174 of the Statement of Case of the State of Goa are outside the Reference made to the Tribunal.

The State of Karnataka has denied that the Government of Karnataka is merely using the pretext of drinking water needs to Hubli and Dharwad as bogey for diversion of waters from the Mahadayi basin and alteration of profile of Mahadayi River. It has further been denied that the purpose is to utilize the waters from the Malaprabha basin entirely and excessively for irrigation purposes, particularly for cash rich crops like sugarcane.

1110. State of Goa has also mentioned at Para 174(ii) that it appears 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.

1111. In response to Para 174(i) of the Amended Statement of Case of the State of Goa, the State of Karnataka has stated at Para 5.130A of Volume 138 that “the sugarcane cultivation in Malaprabha basin in Karnataka has increased by conjunctive utilization of surface water drawn from the canals or river lifts and ground water”.

1112. The case of State of Goa is that the farmers in Karnataka have resorted to raising cash crops, like sugarcane, which need more water and have abandoned Kharif and Rabi crops, which were approved crops as per the modified Detailed Project Report of Malaprabha Reservoir. Therefore, it is necessary for the Tribunal to understand as to what is sugarcane and what is the requirement of water for raising crop of sugarcane.

1113. As per "Handbook of Agriculture" published by the Indian Council of Agricultural Research (MARK-12), sugarcane along with cotton, tea, tobacco and jute and mesta are the major commercial crops. It is stated in the "Handbook of Agriculture" that sugarcane contains 12-15% sugar (sucrose, glucose and fructose), and 80-90% of its production is used for manufacturing white sugar, jiggery (*gur*) and *khandsari*. Regarding the irrigation requirement for sugar cane, the "Handbook of Agriculture" states as under.

> "In sugarcane, maintenance of optimum soil moisture during all stage of crop growth is one of the essential requisites for obtaining high yield. <u>The crop should, therefore, be grown in areas of well-distributed rainfall or under assured and adequate irrigation</u>. In tropical India, depending on the type of the soil, seasonal

> conditions, variety grown, method of planting and rate of manuring, total water requirement of the crop for optimum growth varies from 2,000 to 3,000 mm, inclusive of rainfall. The requirement of *adsali* crop is proportionately higher (3,200 to 3,500 mm). …"
>
> [Emphasis supplied]

From above discussions, it is apparent that sugarcane is a cash crop, it consumes lots of water and that it should be grown in areas of well-distributed rainfall or under assured and adequate irrigation.

1114. The learned Senior Counsel for the State of Goa had also put question No. 84 on 15.9.2017 to Shri A. K. Bajaj, Expert Witness of the State of Karnataka. The question No. 84 and the reply thereof are as under.

> "Q.No.84. Malaprabha basin is indeed a sub-basin of Krishna. In the award rendered by the Hon'ble KWDT, 44 TMC of water has been awarded in favour of Malaprabha reservoir. At the time of the initial estimation of yield in the Malaprabha reservoir, cultivation of sugarcane crop, was on the rise in the North Karnataka region. In volume 86, which are answers on behalf of the State of Karnataka to the interrogatories of State of Goa, at Annexure I thereof at page 11 therein, State of Karnataka has given the figures of area irrigated under Malaprabha reservoir from 1979-80 to 2012-13. At column 1 in S. No. 1, the

figure for 1979-80 for sugarcane is shown as 224 Ha. For the year 2009-10, the sugar cane cultivation figure has risen up to 3038 Ha., and in the years 2010-11 it has gone up to 3421 Ha.

In annexure-2, the figures given by the Office of the Cane Development Commissioner and Director of Sugar are reflected. At S. No. 3 on page 12 of the very said document, the sugarcane demarcated/ allocated Taluka-wise/District-wise for Sugarcane development for each of the existing and proposed sugar factories in command of Malaprabha reservoir are given vide Annexure-I and Annexure-II thereof, at page 13 of the said document namely Vol. 86. In the five factories, the area allocated for sugarcane development of the existing factories works out to 24827 Ha. Apart from this in the Table below on the same page, another five proposed sugarcane factories are reflected. In addition, there is Annexure-III and Annexure-IV also, wherein areas are mentioned.
In the modified DPR of Malaprabha project at Vol.33 (B), there is no whisper about sugarcane cultivation or the area allocated for the same.

In your report annexed to the Affidavit dated 30.12.2016 (Vol. 194), you have dealt at page 11 therein, with the hydrology of the Malaprabha reservoir. You have chosen, perhaps deliberately, to avoid any reference to Malaprabha basin as such or its tributaries. In paragraph 7 of your report at page 12 therein, you have concluded based on the revised DPR of 2009 that Malaprabha reservoir is a deficit reservoir.

Please answer the following questions:-

a. Why have you, instead and in place of dealing with Malaprabha basin and its tributaries, dealt with only the reservoir, conveniently leaving out a large portion to the extent of 80% of the water in the Malaprabha basin?
b. Why have you not dealt with or addressed the issue of large scale untamed and uncontrolled rise in sugar cane cultivation, which consumes the water from the Malaprabha reservoir, in your report?
c. Did you, before undertaking or carrying out the study which has culminated in the report, undertaken an enquiry as regards 2009 modified DPR vis-à-vis the answers given in Volume 86 by the State of Karnataka which display figures from 224 Ha. in 1979-80 to 3038 Ha. in 2009-10, as also the other figure of 24827 Ha. as mentioned herein above?

Ans. My answer to specifically paras (a) to (c) of the question are as follows:-

a. I have dealt with the water available in the Malaprabha Dam Reservoir as, this is the utilisable water. For harnessing the water flowing in the rest of the basin, proper infrastructure will have to be provided.
b. I was discussing the limited issue of reduction in the flows to the reservoir in my report and not the cropping pattern in the command. As such, I have not addressed the issue of cultivation of sugarcane in the command in my report.

c. No, as mentioned in (b) above, I did not undertake the detailed study of the sugarcane figures ranging from 224 Ha. in 1979-80 to 3038 Ha. in 2009-10 or the worked out figure of 24827 Ha. mentioned by the Cane Development Commissioner allocated to the five factories."

1115. In this regard, the cropping pattern mentioned at page 33 of the Salient Features of the Modified DPR of Malaprabha Project (Volume 33B), are shown hereunder.

Name of Crop (Season-wise)	Percentage area (CCA) Kharif (30%) Rabi (53%) Two seasonal (15%)	Kharif		Change in cropping
		Existing (94%)	Proposed (100%)	
Local Jawar		28.00		
Hybrid Maize			67	
Bajra				
Ground nut		6.50	27	
Hybrid Jawar			6	
Wheat		23.50		
Cotton		36.00		

1116. A bare perusal of the above mentioned Table makes it evident that sugarcane was never included in the approved cropping pattern. Therefore, the Tribunal finds it safe to record a

conclusion that cultivation of sugarcane is in violation of the cropping pattern mentioned in the Modified DPR of Malaprabha Project (Volume 33B). What is interesting to note, is that Malaprabha Project in the Naviluteertha in Belagavi District, in Karnataka was completed in the year 1974. The DPR was then revised in the year 2009, which is produced by the State of Karnataka at Volume 33B. A comparison of the salient features of these two project formulations, clearly demonstrates that as per the original approved DPR, the annual water availability at 75% dependability was assessed at about 47 tmc, whereas in the revised DPR, the yield is reduced to about 27 tmc. What is shocking is the fact that, for a yield of about 47 tmc, the proposed gross irrigated area was 1,21,408 hectares, but in the modified DPR when the yield was reduced to about 27 tmc, the gross irrigated area inexplicably has been increased to 1,96,132 hectares. That is evident, if one refers to Item 6.c(vi) at page 18 of the Modified DPR of Malaprabha Project (Volume 33B). Such a high increase in agriculture command is neither explained by the State of Karnataka in any of its pleadings nor an attempt is made to explain such a high increase in irrigated area, by any of the witnesses examined on behalf of the State of Karnataka.

1117. Shri Chetan Pandit, in his Additional Affidavit dated 12.9.2016 (Volume 192) has categorically mentioned on oath that as per reply provided by the State of Karnataka to the interrogatories administered by the State of Goa, it is clear that in Malaprabha command, the area under sugarcane cultivation has increased from 224 hectares in the year 1979-80 to 2756 hectares in the year 2012-13. Thus the agricultural activities have been extended to a great extent and cash crop like sugarcane is supported by the State of Karnataka, for which no satisfactory explanation is furnished either by the State of Karnataka in its pleadings, or by any of the witnesses examined on behalf of the State of Karnataka.

1118. In a book titled "Water Governance in Motion – Towards Socially and Environmentally Sustainable Water Laws" Edited by P. Cullet, A. Gowlland-Gualtieri, R. Madhav and U. Ramanathan, it is stated at page 66 as under.

> "There is also inequity in the distribution of water both between districts and within the same district. For instance, sugarcane-growing areas get water even during droughts, while other areas lack water for subsistence crops or even drinking water. Sugarcane cultivation is problematic not only in terms of equity,

> but also in terms of environmental sustainability. Increased cultivation of sugarcane usually has gone hand-in-hand with lavish use of water for irrigation and use of fertilizers in excessive amounts (which further increases need for water), and has resulted in water logging and salinity in many areas. It is also important to note that the problems of efficiency, equity, and sustainability of water are inter-related. For instance, the growing problem of ground water depletion means that the newer technology needed for pumping water is increasingly less accessible to poor farmers, resulting in inequity in the way different classes of people can cope with groundwater shortage."

1119. Shri Chetan Pandit, in his Additional Affidavit, filed on 12.9.2016 (Volume 192) has mentioned that even new sugarcane factories are coming up in Dharwad District, which means that the new industries would also require and use more quantity of water. For adopting such a disastrous approach, neither any explanation has been offered by the State of Karnataka in its pleading nor has any explanation been offered by any of the witnesses.

1120. Further, the industrial profile of Dharwad District is mentioned in great details by Shri Chetan Pandit in Para 98 of his Additional Affidavit, filed on 12.9.2016 (Volume 192), which also

shows that more industries are being promoted by the State of Karnataka, instead of meeting the drinking water needs of Hubli-Dharwad, en-route villages, etc.

1121. The Tribunal acknowledges the right of the State of Karnataka to develop its economy in whichever way it wants. However, the National Water Policy and the State Water Policy enjoins upon the State of Karnataka to plan the same based on the water resources available in each basin. There is no manner of doubt that the State of Karnataka has committed blatant violation of provisions of National Water Policy as well as State Water Policy by: (i) increasing the irrigated area; (ii) supplying water to a great number of industries; and (iii) by supporting cash crops of agriculture particularly sugarcane, instead of supplying drinking water to meet the needs of Hubli-Dharwad twin city and en-route villages etc. This will have to be regarded as a breach of Article 21 having been committed by State of Karnataka.

1122. From the foregoing paras, it is apparent that: (a) there are considerable inconsistencies in information; (b) at the time of planning of the schemes for diversion of 7.56 tmc of water from Mahadayi river basin to Malaprabha reservoir, all facts were not

taken into consideration; such as change in cropping pattern, conjunctive use of surface water and ground water in Malaprabha basin, and cultivation of sugarcane on large scale etc., for harnessing, the water flowing in the rest of Malaprabha basin proper infrastructure will have to be provided and once, such proper infrastructure is provided, Karnataka would be able to adequately meet, drinking needs of twin city and other villages and its claim for diversion for 7.56 tmc of water from Mahadayi river, would, no longer subsist, and (c) all related issues have not been adequately addressed. The Tribunal is of the opinion that major portion of diversion of 7.56 tmc of water is only for irrigation purposes and not for drinking and other domestic needs of Hubli-Dharwad and other villages.

1123. From the facts emerging from the aforesaid paras, the Tribunal concludes that the State of Karnataka has miserably failed in addressing the water related issues of the north Karnataka region. The Tribunal finds that there is no shortage of drinking water in twin city at all and diversion of water is sought only for the purpose of irrigation. If the State of Karnataka had approached the Tribunal with clean hands and had demanded water for irrigation, for the areas located in North Karnataka, it

would have been easier for the Tribunal, to deal with such a demand. Engineers and Officers responsible for planning and managing the water resources facilities have failed on many counts, which inter-alia include:

a. Inappropriate planning of Malaprabha project with over-estimation of available water resources, and thereby creating huge facilities and high hopes to the people of the region;
b. Non-adherence to the principles of prioritization in water allocation and not making adequate provisions for drinking water supply in modified detailed project report of Malaprabha project in the year 2009 despite the drinking water needs being the topmost priority in the National Water Policy as well as the State Water Policy;
c. Ignoring the factual position of water uses, particularly that in respect of drinking water for the Hubli-Dharwad twin city while modifying the detailed project report of Malaprabha project in the year 2009;
d. Promoting the water guzzler crops like sugar cane etc. in the command of Malaprabha project fully knowing the facts that the region suffers from water scarcity; and
e. Not ensuring efficient management of water resources, particularly the lack of proper maintenance of the created facilities for water supply.

1124. On behalf of the State of Goa, an Article dated 23.01.2014 downloaded from web site is relied upon to

demonstrate that on the basis of advice given by Legal Panel of the State of Karnataka, the claim for drinking water does not exist at all and that, in fact, demand of water from Kalasa-Bhandura is only for irrigation purposes. In support of their claim, the Learned Counsel for the State of Goa has relied upon Annexure – C appended to the "Rejoinder on behalf of the State of Goa to the Reply dated 25.5.2015 filed by the State of Karnataka to Amended Statement of Case of Goa" dated 30.6.2015 (Volume 150).

1125. There is no doubt that the said downloaded Article refers to the advice given by the Legal Panel of the State of Karnataka. However, the Tribunal finds that no question relating to this Article was put by the State of Goa to any of the witnesses examined on behalf of State of Karnataka. Further, Annexure – C of the Rejoinder dated 30.6.2015 is not proved by any of the witnesses examined on behalf of the State of Goa. Therefore, the Tribunal is of the opinion that on the basis of the advice, contained in the Article, it is difficult to come to the conclusion that the demand of water is for irrigation and not for drinking purposes, though, earlier on appreciation of the evidence, the

Tribunal has recorded a firm finding of the fact that in fact the demand for water is for irrigation and not for drinking purposes.

1126. The Tribunal is convinced that the failure on part of the State Government, its high officials and engineers in proper planning and management of water resources of the region, has led to the present crisis where the people residing in the north Karnataka region are facing considerable inconveniences and are deprived of the adequate supply of water for survival as also for livelihood. The situation resulting from highly casual approach to planning of water resources projects, has led to various problems including social conflict of serious nature, as is apparent from averments made by Shri G. M. Madegowda (RW4) at para 14, page 11-12 of his Affidavit (Volume 207), which is reproduced hereunder once again.

> "14. Ever since the project for drawal of water from Malaprabha dam was commenced, there have been conflicts between irrigation demand and drinking water supply more particularly during summer months. The water level in the dam would fall so low from February to June, the drawal of water for drinking water supply would become contentious between City Corporation and the farmers. The farmers of Malaprabha command, farmer organisations and Kannada cultural organisations would resort to protests. The general public of the city

have resorted to dharnas, bundhs, strikes, disrupting the public transport system, etc. This has resulted in drinking water supply getting disrupted. The newspaper clippings reveal about the demonstrations, dharnas, hunger strike sit-ins and city bundhs, occasionally even leading to stoppage of pumping system and water treatment plants, have been resorted to by the farmers against the drawal of water from the dam. On occasions, the protestors including farmers have addressed representations to the Police Commissioner of Hubli-Dharwad City. Anticipating the law and order trouble, the Chief Engineer, Karnataka Urban Water Supply and Drainage Board has addressed the Police Commissioner for providing security to the water supply and treatment installations at the Malaprabha dam and en-route infrastructure. …"

[Emphasis supplied]

In this regard, the Q.No.6 put to Shri Madegowda by the Tribunal and the answer thereof are reproduced hereunder.

"Q.No.6.

…

In this regard, please answer the following:

a. When the provisions of the State Water Policy and National Water Policy are very clear in respect of highest priority to be accorded to the water needs for drinking purposes, how can there be a conflict?
b. How the drinking water supply got disrupted and what actions had been taken by the administrative machinery?

c. What measures have been taken to ensure that there are no such conflicts in future?

Ans. I wish to answer the question in three parts:

a. Citizens of Hubli-Dharwad Municipal Corporation limits, and population of the towns and villages of the area are provided water supply to the extent of 1.98 TMC per year. When that quantity of water is drawn, farmers agitate and claim that they want to grow various crops and their livelihood is affected. But still water is supplied to the residents of Hubli-Dharwad areas.
b. Because of the agitations, there were interruptions in the drinking water supply, but the State administrative machinery and the Police Department had given protection to the installations whenever any such protests emerged.
c. These are administrative matters to be considered at the State level."

The serious nature of the conflict is apparent from the averments made by the witness (RW4) whereas the reply to specific question is indicative of the casual and slipshod approach adopted by the State of Karnataka. Providing police protection to the installations can only be considered as an ad-hoc arrangement. From reply of Shri Madegowda (RW4), it is apparent that no serious effort has been made to find a lasting solution to the conflict of this nature. Unfortunately, the learned

Counsel appearing on behalf of the State of Karnataka also did not address the issue in proper perspective during the course of arguments.

The Tribunal is convinced that an important reason for emergence of conflict of this nature, is the highly casual approach of the State of Karnataka in planning of its water resources without realistic assessment of the available resources and due consideration of all related social, economic and ecological issues, which has led to a situation of creating false hopes to people. When the false hopes created fall to the grounds, the people affected become frustrated and resort to sits-in, holding of demonstration, violence, etc., which are not congenial to a civilized society at all. Nevertheless, it remains a fact that for people of this region, agriculture is the main occupation and dependence on the availability of water is very crucial for their survival. With the realization that the water availability as planned through the Malaprabha Project would be less than the expectation, there are worries and resentment which is apparent from the agitation of the local people. A scant reference to the agitation is made by Shri Madegowda (RW4) in his Affidavit. The

fact that the agitation is going on since long was not seriously disputed by the State of Goa.

During the visit of the Tribunal to various Projects/Sites, a number of delegations representing various sections of the Society also met the Tribunal in the presence of the Legal Teams of the three co-basin States, namely Goa, Karnataka and Maharashtra at Belgaum on 19th December 2013 and Hubli on 21st December 2013. While a patient hearing was given to all the delegations, it was made very clear to them that as per the laid down procedure, the proceedings of the Tribunal would be based strictly on the pleadings made by the three States, namely, Goa, Karnataka and Maharashtra.

1127. The Tribunal also takes note of the fact that the Malaprabha basin gets relatively lower rainfall as compared to the rainfall in the adjoining Mahadayi basin. The relevant portion from para 2.4, pages 47-48 of the "Modified Detailed Project Report of Malaprabha Project" (Volume 33B) is extracted hereunder.

> "…
> The catchment area lies leeward side of the Western ghats. Abnormal variations of rainfall & temperature

could be noticed from high hill slopes to the plains near dam site. The Climatic conditions prevailing in the Project area is that of the Western ghats and Malnad region – consisting of mountains and forested area covering parts of Belgaum in its upper reaches with elevation ranging from 660 to 1100m and the Northern Malnad region – the elevation ranges between 650 to 350m above MSL. Generally the area experiences dry climate with temperature varying from a low of about 20°C in the winter to high of about 45°C during summer. The average annual rainfall in the project area varies between 450 to 600 mm. …"

[Emphasis supplied]

On the other hand, the average annual rainfall in the adjoining Mahadayi catchment area is relatively of very high order i.e. 3800 mm to 5700 mm, as is apparent from para 27, page 40 of the "Statement of Case of the State of Goa" (Volume 131), which is reproduced hereunder.

"27. 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. A very large quantity of water that flows down the Mandovi all the year round originates in the streams and rivulets around Kankumbi, Jamboti, Talewadi, Gavali and Hemadga villages where Karnataka's diversion and hydroelectric dams are to come up. …"

The extent of variation in the rainfall in the two regions is also apparent from the report titled “Rainfall Statistics of India – 2016” [Report No. ESSO/IMD/HS/R.F.REPORT/01(2017)/23] of the India Meteorological Department (Ministry of Earth Sciences). It provides the Subdivision-wise Normal Annual Rainfall in Table 33 on pages 102-103. As per this Report, the Normal Annual Rainfall for the North Interior Karnataka (N.I. Karnataka) Subdivision is 740.3 mm, whereas the Normal Annual Rainfall for the Konkan & Goa subdivision is 3101.1 mm. The Tribunal also finds that seven blocks of Belgaum District and four blocks of Dharwad District are included in the list of Drought Prone Area Programme of the Government of India.

1128. This Tribunal has to ensure that justice is done to the people residing in the region despite the failure on part of the Karnataka Government, its high officials and engineers in proper planning and management of water resources of the region. Accordingly, all related issues, particularly, the hydrology of the basin, the economic and social needs of the people residing in the region, the extent of population dependent on the waters of the basin, sustainability of the resources and related ecological

aspects have been considered by the Tribunal in broader perspective.

In this regard, it is noted by the Tribunal that the Supreme Court, in its Judgement of 16.2.2018 in Civil Appeal No. 2453 of 2007 on Carvery issue has referred to the Helsinki Rule and at para 306 of judgement, the Article V of the Helsinki Rule which enumerates the relevant factors, to be taken into consideration has been quoted. The Supreme Court has put emphasis on the following three factors.

- 5. The economic and social needs of each basin state
- 6. The population dependent on the waters of the basin in each basin state
- 8. The availability of other resources

In para 367 of its judgment, the Supreme Court has, inter-alia, observed as under.

> "… The said principles can be regarded as functional dynamics while equitable distributing the water in an inter-State river disputes. <u>The salient feature of all these factors has to have inherent variability and inevitable flexibility thereof having regard to the local conditions, for it is difficult to ignore the undeniable and common emphasis necessary to ensure beneficial use of the</u>

> available resources for a basin state and logically for its dependent populace warranted by the economic and social needs. Be it stated, while determining the said needs, amongst others, past and existing utilization of the water have to be borne in mind. To remain oblivious to the same would amount to playing possum with the doctrine of equitable distribution *in praesenti*. The noticeable quintessence of the determinants is the predication for a delicate balance in adjustments of the needs based on realistic, reasonable, judicious and equitable canons so much so that while satisfying the requirements of a basin state, a co-basin state is not subjected to any substantial injury. Though in terms of Articles VI and VII, any other category of users is not entitled to any inherent preference over any other use or category of users, yet the precedence of an existing reasonable use of a basin state over a proposed future use of a co-basin state has been recognized."
>
> [Emphasis supplied]

In view of above, and with a view to doing complete justice to the people, the Tribunal has undertaken the exercise of balancing in adjustments of the needs, based on realistic, reasonable, judicious and equitable canons, so much so that while satisfying the requirements of a basin state, a co-basin state is not subjected to any substantial injury.

1129. Some of the important facts related to the proposed demand of water of 7.56 tmc for meeting the drinking water demand of Hubli-Dharwad, en-route villages, etc., which have emerged from the foregoing paras are listed by the Tribunal as under.

a. The present level of availability of water at 75% dependability in the Malaprabha reservoir i.e., 26.76 tmc is far less than the quantum of 47.25 tmc, which was indicated as the water availability at 75% dependability for planning the project in the year 1970.
b. The Government of Karnataka has already initiated measures for improving the water supply infrastructure for twin city of Hubli-Dharwad to ensure supply of 5.2 tmc of water on 24X7 basis with the assistance of the World Bank.
c. The planning for improving the water supply infrastructure for twin city of Hubli-Dharwad corresponding to 5.2 tmc indicates that the long term future water requirement for twin city of Hubli-Dharwad is 5.2 tmc only and not 6.63 tmc (the projected domestic water demand of Hubli-Dharwad twin city out of total demand of 7.56 tmc).
d. Measures have been taken by the Government of Karnataka to minimize the wastage of water through leaks in water supply pipe network etc. and it has shown positive results.
e. There is scope for more efficient use of water through demand side management.

f. The Modified Detailed Project Report of Malaprabha Project (Volume 33B) has, duly accounted for 1.08 tmc of water, for Hubli-Dharwad although the same is not reflected in the Salient Features of the DPR.

g. From the information included in "Report on Drinking Water Demand of Hubli-Dharwad, En-route villages, etc. from Malaprabha reservoir" (Vol 16), it is apparent that at present, 1.98 tmc of water is being withdrawn from the Malaprabha reservoir for twin city of Hubli-Dharwad. Shri Madegowda, the witness of the State of Karnataka has also indicated so in answer to question No. 3, put to him by the Tribunal.

h. If the present level of withdrawal of 1.98 tmc of water in the year 2017 is considered, the additional future requirement for Hubli-Dharwad twin city only, works out to be about 3.22 tmc. Even with addition of demands of water of (a) 0.65 tmc for livestock, (b) 0.21 tmc for domestic water for enroute villages, and (c) 0.07 tmc for Kundagol town, the overall demand would not be more than 4.08 tmc. With allocation of 1.08 tmc as indicated in the Modified Detailed Project Report of Malaprabha Project (Volume 33B), the additional future requirement for Hubli-Dharwad twin city only, works out to be about 4.12 tmc.

Estimate of Water Availability at the Proposed Diversion Sites

1130. The Government of Karnataka has proposed to divert 7.56 tmc of Waters of Mahadayi river basin to Malaprabha reservoir from two sites namely, proposed Bhandura dam site and the proposed Kalasa dam site. The catchment area at the proposed Bhandura dam site is 32.23 sq. km. In addition, waters from the catchment area of 25.50 sq. km. of proposed Kalasa dam (including the catchment areas of proposed Kalasa dam site, Haltara diversion and Surla diversion) is proposed to be diverted at from Kalasa dam site.

1131. The availability of water resources at the proposed Bhandura dam site and proposed Kalasa dam site at 75% dependability assessed: (a) in the respective DPRs of Bhandura and Kalasa projects; (b) in the Report of Prof. A. K. Gosain (Volume 193); (c) in the Report of Shri Chetan Pandit (Volume 196); and (d) by the Tribunal vis-à-vis the proposed diversion by the State of Karnataka is summarized in the following Table.

Table-1: Estimated Water Availability at 75% Dependability at Proposed Bhandura and Kalasa Dam Sites

Sl. No.	Description	Proposed Bhandura Dam Site	Proposed Kalasa Dam Site	Total
1.	Project Reports of Kalasa and Bhandura project of the Year 2000 (Volume 17 & 20)	4.136	2.71	6.846
2.	Project Reports of the Year 2012 / 2010 (Volume 19 & 21)	2.4	3	5.4
3.	Report of Prof. A. K. Gosain (Volume 193)	3.7	3.8	7.5
4.	Report of Shri Chetan Pandit (Volume 196)	1.50	1.98	3.48
5.	Assessment by the Tribunal	2.77	2.19	4.96
	Diversion Proposed by the State of Karnataka	**4.00**	**3.56**	**7.56**

1132. From the particulars, mentioned in above Table, it is most apparent that the water availability at 75% dependability at the proposed sites of Kalasa-Bhandura diversion project is not adequate at all to meet the projected demand. As a matter of fact, a specific quantum of water is necessarily required to be considered towards environmental flow for the downstream reaches and has to be deducted from the overall water available at these sites.

1133. Whenever, a project is taken up for diversion of water for various uses, the flow in the downstream reaches of such diversion gets reduced and adversely impacts the ecology of the river in the downstream reaches of the river which inter-alia affects the forests, wildlife etc. In order to minimize the adverse impacts, a specific quantum of flow is required to be ensured for the downstream reaches, which is to be assessed in the form of environmental flow. With reference to the proposed projects for diversion of water of Mahadayi river basin, environmental flow is essentially required to minimize the adverse impacts of such diversions in the downstream reaches within the territory of the State of Karnataka as also that in the State of Goa. The Tribunal observes that on the important issue of environmental flow, the State of Karnataka has neither uttered a word in its pleadings nor examined any witness. The Tribunal also notices that the State of Maharashtra has also neither addressed this vital issue through its pleadings nor examined any witness in this regard.

1134. The State of Goa has flagged this important issue in its pleading. The State Goa has also examined an expert witness in this regard. Shri Rajendra P. Kerkar, Expert Witness of the State of Goa recommended a procedure for estimating the

environmental flow based on the Research Report No. 107 of International Water Management Institute (IWMI), titled 'An Assessment of Environmental Flow Requirements of Indian River Basins' by V Smakhtin and M Anputhas [MARK-GOA/35(Colly)]. This has been examined in details at paras 1035 to 1037 and the Tribunal has not accepted the recommendations of Shri Rajendra P. Kerkar, witness of the State of Goa in respect of the procedure suggested for computation of environmental flow.

1135. In the absence of any reliable assessment of environmental flows by the party States, the environmental flow has been computed by the Tribunal in accordance with the provisions in the "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environment Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change published in April 2015. Thereafter, the upper limit of the quantum of water that could be considered for consumptive uses within the Basin and / or diversions depending upon the needs, has also been assessed and the same is indicated in the Table-2 prepared by the Tribunal as per the procedure indicated at page 48 of the "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects /

Activities Requiring Environmental Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change published in April 2015 (MARK-37).

Table-2: Estimate of Environmental Flow and Upper Limit of the Quantum of Water that could be considered for Consumptive Uses within the Basin and / or Diversions to Malaprabha Reservoir

Sl. No.	Description	Proposed Bhandura Dam Site	Proposed Kalasa Dam Site	Total
1.	Water Availability at 75% Dependability (as assessed by the Tribunal)	2.77	2.19	4.96
2.	Water Availability at 90% Dependability (as assessed by the Tribunal)	1.96	1.55	3.51
3.	Environmental Flow @ 30% of the Water Availability at 90% Dependability (the flow at proposed sites of diversion being only during the monsoon period)	0.59	0.47	1.06
4.	Upper Limit of the Quantum of Water that could be considered for Consumptive Uses within the basin and / or for Diversions outside the basin	2.18	1.72	3.90

1136. Therefore, the quantum of water that could be considered for consumptive uses within the basin and / or diversion from the two proposed projects namely, proposed Bhandura dam and proposed Kalasa dam cannot be more than

2.18 tmc and 1.72 tmc respectively after deducting need for environmental flows.

1137. Keeping in view the overall scenario related to water availability, water needs, water demands, essential requirements towards environmental flow etc., the Tribunal is of the opinion that the State of Karnataka would be entitled to divert 2.18 tmc at proposed Bhandura dam and 1.72 tmc of water at proposed Kalasa dam, subject to fulfilling of following directions.

a. The State of Karnataka shall undertake fresh planning and development of scheme for consumptive uses within the basin and / or diversion outside the basin including the reservoir losses etc. for not more than 2.18 tmc at the proposed Bhandura dam site; and

b. The State of Karnataka shall undertake fresh planning and development of scheme for consumptive uses within the basin and / or diversion outside the basin including the reservoir losses etc. for not more than 1.72 tmc at the proposed Kalasa dam site. This will necessarily include the undertaking of the exercise for re-designing of the existing structures in consultation with Central Agency and undertaking works according to revised plan and design.

It is further noticed that such utilizations would necessarily require thorough review and modification of the detailed project reports by the State Government. Therefore, it is directed that the State of Karnataka shall prepare modified detailed project reports (DPRs) for diversion of water from Mahadayi River. It is also clarified that the proposals in the form of detailed project reports would be considered for implementation only: (a) after technical appraisal of the proposed projects by the central agencies; and (b) after obtaining all mandatory clearances as required by law.

Diversion of 5.527 tmc of Water from Mahadayi River Basin to Supa Reservoir on Kali River

1138. The State of Karnataka has also proposed diversion of 5.527 tmc of water at 75% dependability to Supa reservoir of the Kali Hydro Electric Project to augment the water of Supa reservoir for the purpose of hydropower generation.

1139. The details in respect of water availability for various schemes at different proposed dam sites for diversions, are provided in Para 5.3, pages 16-17 of the "Project Report for Diversion of Water from the Mahadayi Basin to Kali Basin (Diggi,

Viranjole and Katla-Palna Diversion Schemes)" – Annexure 71 to the Statement of Claims of the State of Karnataka (Volume 54B). The catchment areas and the water availability for the proposed schemes at different dam sites are also examined as indicated in Table-3, which is as under.

Table-3: Proposed Schemes and Projects for Diversion of 5.527 tmc of Waters of Mahadayi River Basin to Supa Reservoir on Kali River (as submitted by the State of Karnataka)

Diversion Scheme	**Proposed Dam Site**	**Catchment Area in sq. km.**	**Water availability in tmc**
1. Diggi diversion scheme	a. Bundeli Dam	10.40	1.208
	b. Maranala Dam	5.20	0.604
	Sub-total	15.60	1.812
2. Viranjole diversion scheme	a. Pasal nala 1 Dam	6.20	0.720
	b. Pasal nala 2 Dam	3.30	0.382
	Sub-total	9.50	1.102
3. Katla-Palna diversion scheme	a. Katla Dam	16.10	1.870

	b. Palna Dam	6.40	0.743
	Sub-total	22.50	2.613
Total		**47.60**	**5.527**

1140. Major structures proposed to be constructed for diversion of 5.527 tmc of water of Mahadayi river basin to Supa reservoir of Kali project comprise 6 dams as mentioned in Table-3, and 6 water conductor systems namely, (a) diversion tunnel from Maranala dam to Supa reservoir, (b) diversion tunnel from Bundeli Dam to Supa reservoir, (c) Inter-connecting tunnel from Pasal nala 1 Dam to Pasal nala 2 Dam, (d) water conductor system from Pasal nala 2 Dam to Supa reservoir, (e) diversion channel from Palna Dam to Katla Dam, and (f) diversion tunnel from Katla Dam to Supa reservoir.

1141. The stated objective of the proposed diversion of 5.527 tmc of water from Mahadayi river basin to Supa reservoir is to augment the water of Supa reservoir where the water availability at the time of planning was over-estimated and the present level of water availability is considerably less than what was estimated at planning stage. In this regard, Para 8 on 'Hydrology of Kali Reservoir', pages 13-14 of the Affidavit dated

30.12.2016 (Volume 194) of Shri A. K. Bajaj, Expert Witness of the State of Karnataka is reproduced hereunder.

> "Hydrology of Kali Reservoir:
> 8. The catchment area at Supa Dam site (Kali Dam) across river Kali which is a west flowing river is 408 sq.miles (1057 sq.kms) and the average yield estimated on the basis of rainfall was 119.84 tmc (3394 M.cum). The construction of the project which was started in 1971 was completed in 1987. The gross storage capacity at full reservoir level and maximum water level is 147.54 tmc (4178 M.cum) and 151.96 tmc (4303 M.cum) respectively and live storage capacity is 132.73 tmc (3758.4 M.cum). The main components of the project are the Supa Dam with a designed storage capacity of 147.54 tmc and a power house for hydel generation. <u>Again, as in the case of the Malaprabha Dam, the water yield at the time of planning the project appears to have been over estimated</u> and the Supa Dam has filled only twice out of 29 years (1994 and 2006) since the start of filling in 1984. The recorded average yield is only 95.66 tmc. The power potential with the originally estimated yield and storage created in the Supa Dam is 1255 Mw with a head of 488 mtrs. The maximum annual energy that could be generated is 5605 Mu; but due to shortage of yield the average annual energy generated is of the order of 3600 Mu only by the planned diversion of water from Mahadayi basin to Kali dam, the total generation could be augmented by 182 Mu."
>
> [Emphasis supplied]

1142. From the above, it is noted that the shortfall in the water availability of the Supa reservoir (due to over-estimation at the time of planning) is about 51.88 tmc, which is about 54.2% of the present level of water availability. The proposed diversion of 5.527 tmc is only about 5.7% of the present level of water availability in Supa reservoir. Obviously, the contribution of the proposed diversion is minuscule as compared to the shortfall resulting from faulty planning of the Project due to over-estimation of water availability at planning stage. Thus, the proposed diversion will not at all be of much help in utilizing the full potential of the Kali Hydro Electric Power Project.

1143. The diversion of water from the Mahadayi river basin along with the extensive construction activities as detailed in Para 1140 above, is bound to have adverse environmental impacts. The Tribunal notes that the State of Karnataka has not produced any study related to environmental impact assessment (EIA) in accordance with the "Standard Terms of Reference (TOR) for EIA / EMP Report for Projects / Activities Requiring Environment Clearance under EIA Notification 2006" of the Ministry of Environment, Forest and Climate Change published in April 2015. Similarly, the detailed project report (DPR) also does

not mention about any mitigation measures to be undertaken by the State of Karnataka to address likely adverse impacts of proposed diversion of water and that of extensive construction activities either in the territory of the State of Karnataka or in the territory of the State of Goa.

1144. In this regard, question No. 7, put on 29.11.2017 to Shri S. M. Jamdar, the Witness of the State of Karnataka by the learned Advocate General of the State of Goa is reproduced hereunder.

> "Q.No.7. Please refer to para 12, page 12 of your Affidavit dated 09.11.2017, (Vol. 206) where in, you have stated as under:
>
> "*Hydropower is renewable, non- polluting and environment friendly source of energy*."
>
> Also refer to para 13, page 13 of your affidavit dated 9.11.2017 wherein you have stated as under:
>
> "*It is also the preferred source of power particularly in the context of rising environmental concerns of global warming*."
>
> It appears that while making these statements you have not taken into consideration the environmental impacts of stoppage of water, diversion, the construction works including the river diversion works (dams or barrages), water conductor system, control structures, roads, worker colonies and allied works that will need to be

undertaken, and all these will have a long term adverse impact on environment.

However, you have conveniently chosen to remain silent on the above mentioned and any other adverse environmental impacts of Hydropower projects.

I, therefore, put it to you that the statement made by you at paras 12 and 13 quoted above is without any basis, whatsoever, and without conducting any study to that effect, whatsoever. What do you have to say?

Ans. I would reply that while I am not an expert in Hydrology and power engineering, by way of having any professional degree or education and training but I have worked as Managing Director, for nearly three years, of Karnataka Power Corporation Ltd., (KPCL), which constructed, and today owns and operates nearly 4000 MW of hydel power, in the environmentally most difficult areas. We are aware of the environmental issues and we have considered them. We will be able to take care of them as and when situation arises with the relevant Authorities in the Government."

[Emphasis supplied]

1145. The Tribunal also notes that the estimate of quantum of 5.527 tmc of water proposed to be transferred is relatively higher than the assessment made by Prof. A. K. Gosain, the Expert Witness of the State of Karnataka as well as that by Shri Chetan Pandit, the Expert Witness of the State of Goa. The assessment of needed water, must be determined through a

scientific study, as mandated by the National Water Policy, 2012. It is to be noticed that, the State of Karnataka has miserably failed to produce, such a scientific study before the Tribunal, for its consideration. A comparative statement of the assessment of water availability by Project Authorities, the Expert Witnesses of the State of Karnataka and the State of Goa and that by the Tribunal are indicated in Table-4.

1146. The quantum of water that could be considered for diversion should have been estimated after accounting for the environmental flows as also the losses from the reservoir and the diversion channels etc. It is apparent that the likely benefits are over-estimated. The assessment of environmental flow suggests that the available water of 4.09 tmc at 75% dependability will have to be reduced by about 1.00 tmc on account of environmental flow alone. Further reduction will have to be made for evaporation and seepage losses from the reservoir and the diversion channels etc. Obviously, the proposal does appear to be of much benefit to the society, particularly if the likely adverse environmental impacts are kept in view.

Table-4: Comparative Statement of the Assessment of Water Availability for Diggi Diversion Scheme, Viranjole Diversion Scheme and Katla-Palna Diversion Scheme

Diversion Scheme	Proposed Dam Site	Water availability (in tmc) as per DPR	Water availability (in tmc) as assessed by Prof. Gosain	Water availability (in tmc) as assessed by Shri Chetan Pandit	Water availability (in tmc) as assessed by the Tribunal
1. Diggi diversion scheme	a. Bundeli Dam	1.208			
	b. Maranala Dam	0.604			
	Sub-total	1.812	1.8	1.0521	1.34
2. Viranjole diversion scheme	a. Pasal nala 1 Dam	0.720			
	b. Pasal nala 2 Dam	0.382			
	Sub-total	1.102	0.8	0.7320	0.82
3. Katla-Palna diversion scheme	a. Katla Dam	1.870			
	b. Palna Dam	0.743			
	Sub-total	2.613	2.5	1.5174	1.93
Total		**5.527**	**5.1**	**3.3015**	**4.09**

1147. While discussing the matters related to "Augmentation of Supa Reservoir" at Para 5.23, on pages 122-124 of the (Written Submissions on behalf of the State of Karnataka" (Volume 220), the learned Counsel for the State of Karnataka referred to a Statement titled "NOTE ON STORAGE CAPACITY OF KALI HYDRO-POWER DAM" as Enclosure A-6. At

Para 3(iv), page 196 of the said statement, the following has been stated.

> "(iv) Kali Hydro-Power Project being a commercial venture, naturally, to achieve the above objectives, the storage was envisaged more than average yield."
>
> [Emphasis supplied]

Thus, the State of Karnataka treats the Kali Hydro-Electric Power Project as a commercial venture.

1148. It is noted by the Tribunal that the National Water Policy 2012 has well defined priorities in respect of water uses. Relevant paras i.e., Para 1.3 (v) and Para (vi) of the Preamble of the National Water Policy 2012, is reproduced hereunder.

> "(v) Water is essential for sustenance of eco-system, and therefore, minimum ecological needs should be given due consideration.
>
> (vi) Safe Water for drinking and sanitation should be considered as pre-emptive needs, followed by high priority allocation for other basic domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco-system needs. Available water, after meeting the above needs, should be allocated in a manner to promote its conservation and efficient use."
>
> [Emphasis supplied]

1149. Para 3 of the National Water Policy 2012 on the 'Uses of Water' is also reproduced hereunder.

"3. USES OF WATER

3.1 Water is required for domestic, agricultural, hydro-power, thermal power, navigation, recreation, etc. Utilisation in all these diverse uses of water should be optimized and an awareness of water as a scarce resource should be fostered.

3.2 The Centre, the States and the local bodies (governance institutions) must ensure access to a minimum quantity of potable water for essential health and hygiene to all its citizens, available within easy reach of the household.

3.3 Ecological needs of the river should be determined, through scientific study, recognizing that the natural river flows are characterized by low or no flows, small floods (freshets), large floods, etc., and should accommodate developmental needs. A portion of river flows should be kept aside to meet ecological needs ensuring that the low and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use.

3.4 Rivers and other water bodies should be considered for development for navigation as far as possible and all multipurpose projects over water bodies should keep navigation in mind right from the planning stage.

> 3.5 In the water rich eastern and north eastern regions of India, the water use infrastructure is weak and needs to be strengthened in the interest of food security.
>
> 3.6 Community should be sensitized and encouraged to adapt first to utilization of water as per local availability of waters, before providing water through long distance transfer. Community based water management should be institutionalized and strengthened."
>
> [Emphasis supplied]

From the above, it is apparent that hydropower development and that too as a commercial venture, is not at all a priority, within the meaning of National Water Policy 2012, and cannot be approved / recognised by the Tribunal, at all.

1150. The Tribunal notes that the priority for hydro-power development comes only after safe water for drinking and sanitation, which is considered as pre-emptive needs, followed by high priority allocation for other basic domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco-system.

1151. In view of above, the Tribunal is of the opinion that the demand of the State of Karnataka for diversion of 5.527 tmc

of water of Mahadayi river basin to the Supa reservoir of the Kali Hydro-Electric Power Project, for generation of hydro-power is not justified at all and cannot be accepted by the Tribunal. The demand/claim for the said diversion of 5.527 tmc of water, is therefore, hereby rejected.

Non-consumptive Use of 13.437 tmc of Water from Mahadayi River Basin at 75% dependability for Hydro-Power Generation through Mahadayi Hydro Electric Power Project at Kotni

1152. The State of Karnataka has proposed utilization of 13.437 tmc of waters of Mahadayi river basin for in-basin development of water resources for hydro-power generation through Mahadayi Hydro Electric Power Project at Kotni. In addition, consumptive use of 1.5 tmc for irrigation, drinking water and other uses has also been proposed through the said project. The aspect of consumptive use of 1.5 tmc has already been examined in paras 1048 and 1049 above, and the Tribunal has found the proposal of, consumptive use of 1.5 tmc of water from Mahadayi Hydro Electric Power Project as future use within the basin can be granted and in fact is granted.

1153. The proposed use of 13.437 tmc of water for hydropower generation is non-consumptive use. In principle, the non-consumptive use of water for hydropower generation within the basin can be agreed without any hesitation, provided it does not alter the river flows adversely, in the downstream reach.

1154. It is noted that the water availability at 75% dependability at the proposed Kotni dam site has been indicated as 14.564 tmc in the statement for salient features at page 15 of the "Project Report of Mahadayi Hydro Electric Power Project" – Annexure 70 to the Statement of Claims of the State of Karnataka [Volume 54(a)].

1155. However, the water availability at the Kotni dam site has also been assessed by Prof. A. K. Gosain, Expert Witness of the State of Karnataka and Shri Chetan Pandit, Expert Witness of the State of Goa. It is found that there are considerable variations in the values of water availability at 75% dependability at the Kotni Dam site. While the water availability at 75% dependability has been assessed as 10.6 tmc by Prof. Gosain, Shri Pandit has assessed the water availability at 75% dependability

as 6.588 tmc only. The Water availability at the proposed Kotni Dam site has also been assessed independently by the Tribunal.

1156. The values of water availability assessed by the Project Authorities, Prof. Gosain, Shri Pandit and that by the Tribunal are presented in Table-5.

Table-5: Comparative Statement of the Assessment of Water Availability at Kotni dam site (for independent catchment area of 93.19 sq.km.) by the project authorities and the Expert Witnesses of the States of Karnataka and Goa.

Sl. No.	Description	Assessed value of Average Water Availability (in tmc)	Assessed value of Water Availability at 75% Dependability (in tmc)
1	As per Detailed Project Report [Volume 54(a)]	17.163	14.564
2	As per Report of Prof. A. K. Gosain [Volume 193]	14.3	10.6
3	As per Report of Shri Chetan Pandit [Volume 196]	8.626	6.588
4	As per Assessment by the Tribunal	9.76	8.02

1157. The Tribunal notices that the hydrological data have been observed by the State of Karnataka at Chapoli site (with catchment area of 124.4 sq.km.). It is found that the average value of the annual water availability on the basis of observed data at Chapoli is about 377.43 Mcum or 13.32 tmc. Using the average annual water availability of 13.32 tmc from the

catchment area of 124.4 sq.km, the average annual water availability for the independent catchment of Kotni dam (with catchment area of 93.19 sq.km.) works out to be 9.98 tmc on area proportion basis. This value of 9.98 tmc, estimated by the Tribunal, on the basis of observed discharge data at the Chapoli site of the State Government of Karnataka, matches very closely with the average water availability of 9.76 tmc assessed by the Tribunal and indicated in Table-5 above.

1158. In view of the above, it is considered necessary that the project features must be revised in the light of the revised assessment of water availability as 8.02 tmc at 75% dependability and not 14.564 tmc indicated in the "Project Report of Mahadayi Hydro Electric Power Project" – Annexure 70 of the Statement of Claims of the State of Karnataka [Volume 54(a)] and thereafter only, utilization of 8.01 tmc of water for in-basin development of Mahadayi Hydro Electric Power Project at Kotni, would be permissible.

1159. Since water would be released in the downstream of the proposed Kotni dam after hydropower generation, there should not be any issue related to environmental impact.

However, it is considered necessary that proper regulation schedule for the project is prepared and the same is strictly adhered to by the project authorities.

1160. In view of the facts emerging from foregoing paras, the Tribunal is of the view that the State of Karnataka will have to modify the Detailed Project Report (DPR) for the proposed Mahadayi Hydro Electric Power (MHEP) Project for: (a) consumptive use of 1.5 tmc of water within the basin for drinking water, irrigation, etc.; and (b) non-consumptive use for hydropower generation within the basin after duly accounting for the reservoir losses etc. For the purpose of planning of Mahadayi Hydro Electric Power (MHEP) project, the total available water at 75% dependability at the proposed project site will be taken as 8.02 tmc i.e., the water availability at 75% dependability assessed by the Tribunal (from catchment area of 93.19 sq.km. i.e., without the Bhandura catchment of 32.25 sq.km.) only.

1161. It is hereby directed, in clear terms that such utilizations would be permissible only after thorough review and modification of the detailed project reports and that the

proposals in the form of detailed project reports would be considered for implementation only: (a) after technical appraisal of the proposed projects by the central agencies; and (b) after obtaining all mandatory clearances as required by law. Till such exercises are completed, no amount of water shall be actually utilized at all by the State of Karnataka, for the proposed Mahadayi Hydro Electric Power Project at Kotni.

Diversion of 7 tmc of surplus water available in Mahadayi basin at the proposed Kotni dam site at 75% dependability

1162. As per the information provided in the "Detailed Project Report for Diversion of Surplus Water from Foreshore of Kotni Dam (MHEP) to Malaprabha River" – Annexure 79(A) to the Statement of Claims of the State of Karnataka [Volume 105(a)], the State of Karnataka has proposed diversion of 7 tmc of surplus water from Kotni reservoir of the Mahadayi Hydro Electric Power (MHEP) Project. Out of proposed 7 tmc of surplus water: (a) 3 tmc of water is to be utilised for protective irrigation in DPAP areas of Ramdurga, Saundatti and Bailhongal Taluks in Belgaum district; (b) 2 tmc of water to be utilized for drinking water and irrigation by recharge of ground water by filling Minor Irrigation Tanks in DPAP areas of Ramdurga, Saundatti and Bailhongal

Taluks in Belgaum District by lift schemes; and (c) 2 tmc of water is to be utilized for areas in Malaprabha command which are not getting adequate water as originally planned.

1163. From the details available at paras 4.1, 4.2 and 4.3 at pages 6-13 of the "Detailed Project Report for Diversion of Surplus Water from Foreshore of Kotni Dam (MHEP) to Malaprabha River" – Annexure 79(A) to the Statement of Claims of the State of Karnataka [Volume 105(a)], it apparent that 7 tmc of surplus water, after diversion to Malaprabha river, is proposed to be used for following purposes.

a. 0.86 tmc for drinking water needs of three Talukas namely, Ramdurga, Saundatti and Bailhongal in Belgaum District.
b. 3 tmc for protective irrigation in DPAP areas of Ramdurga, Saundatti and Bailhongal Taluks in Belgaum district.

c. 2 tmc for irrigation in the areas duly covered under the existing command of Malaprabha Project.
d. 1.14 tmc for ground water recharge.

1164. On this matter, a specific Issue i.e., Issue No. 37 has been framed by the Tribunal for determination as under.

> "37. Whether the State of Karnataka proves that (a) surplus water is available at Kotni site in 27 out of 30 years, (b) the minimum and maximum available surplus water with respect to 75% dependable yield is 2.421

> tmc and 35.084 respectively, (c) the minimum and maximum available surplus water with respect to 50% dependable yield is 8.043 tmc and 35.084 tmc respectively, (d) out of surplus water, 7.00 tmc could be diverted by using carryover capacity of Malaprabha dam, and that (e) the diversion of this 7.00 tmc of surplus water would moderate the floods in Goa and reduce the wastage to sea during monsoon."

1165. The aforesaid Issue No. 37 has not been examined by any of the witnesses of the State of Karnataka in its entirety. Shri A. K. Bajaj, Expert Witness of the State of Karnataka has referred to the demand of 7 tmc of surplus water under Para 9, pages 14-15 of Annexure-A to his Affidavit filed on 30.12.2016 (Volume 194) while describing the "Water Needs as Claimed by the three co-basin States of Karnataka, Goa and Maharashtra". Shri S. M. Jamdar, Witness of the State of Karnataka, in his Affidavit dated 10.11.2017 (Volume 206) has only discussed the need of transfer of 7 tmc of water to Malaprabha reservoir from surplus water at Kotni Dam for providing protective irrigation, drinking water needs etc. in mitigating the hardship caused to the inhabitants in drought prone areas in Malaprabha basin. Prof. A. K. Gosain, Expert Witness of the State of Karnataka has only estimated the availability of water at proposed Kotni dam site and the same is given in Table-4, page 15 of his Report of November 2016

(Volume 193). Thus, aspects of availability of surplus water, particularly the quantum of available surplus water at Kotni reservoir in different years and the reliability of such surplus water, have not been examined by any of the witnesses of the State of Karnataka.

1166. Analysis related to quantum of surplus water available in different years at the proposed Kotni dam site is included in Table-5 at page 82 of the "Annexure-79(A) – Detailed Project Report for Diversion of Surplus Water from Foreshore of Kotni Dam (MHEP) to Malaprabha River, Vol-I General Report" filed by the State of Karnataka on 5.2.2015 [Volume 105(a)]. In this Table, [i.e., Table-5 at page 82 of Volume 105(a)], the water available in different years is given in Col. 2. It is noted that the availability of water shown in Table-5 at page 82 of Volume 105(a) is entirely different from the values of water availability assessed by Prof. A. K. Gosain, Expert Witness of the State of Karnataka and presented by him in Table-4 at page 15 of his Report of November 2016 (Volume 193). The water availability in different years indicated in Table-5 at page 82 of Volume 105(a) is shown in Col. 3 of Table-6 and the water availability in different years indicated in Table-4, page 15 of the Report of November 2016 of

Prof. A. K. Gosain (Volume 193) is shown in Col. 4 of Table-6. The average annual water availability as per Table-5 at page 82 of Volume 105(a) is 28.5 tmc, but the average annual water availability as per Table-4 at page 15 of Volume 193 is only 25.1 tmc.

Table-6: Comparison of the Estimation of Surplus Water at Proposed Kotni Dam site with Flow Series in Vol. 105(a) and that with Flow Series in Vol. 193 [in tmc]

Sl. No.	Year	Flow Series at Kotni Site as per Col. 5, Table-5 at Page 82 of Vol. 105(a)	Flow Series at Kotni Site as per Col. 16, Table-4 at Page 15 of Vol. 193	Surplus with respect to Flow Series in Vol. 105(a)		Surplus with respect to Flow Series in Vol. 193	
				Abstraction	Surplus (Col.3 – Col.5)	Abstraction	Surplus (Col.4 – Col.7)
1	2	3	4	5	6	7	8
1	1980	54.443	43.1	19.359	35.084	19.359	23.741
2	1981	30.562	31.4	19.359	11.203	19.359	12.041
3	1982	35.24	36.7	19.359	15.881	19.359	17.341
4	1983	29.893	23.3	19.359	10.534	19.359	3.941
5	1984	34.766	28.9	19.359	15.407	19.359	9.541
6	1985	14.509	22.3	14.509	0	19.359	2.941
7	1986	20.388	20.1	19.359	1.029	19.359	0.741
8	1987	18.379	17.4	18.379	0	17.4	0
9	1988	34.764	28	19.359	15.405	19.359	8.641
10	1989	23.173	23.6	19.359	3.814	19.359	4.241
11	1990	37.309	34.1	19.359	17.95	19.359	14.741
12	1991	27.794	25.6	19.359	8.435	19.359	6.241
13	1992	27.009	25.2	19.359	7.65	19.359	5.841
14	1993	25.986	24.2	19.359	6.627	19.359	4.841
15	1994	40.986	41.5	19.359	21.627	19.359	22.141
16	1995	20.727	17.2	19.359	1.368	17.2	0
17	1996	15.92	16.9	15.92	0	16.9	0
18	1997	30.255	28.3	19.359	10.896	19.359	8.941
19	1998	23.813	20.3	19.359	4.454	19.359	0.941
20	1999	32.341	27.5	19.359	12.982	19.359	8.141
21	2000	26.666	19.3	19.359	7.307	19.3	0
22	2001	20.397	16.2	19.359	1.038	16.2	0
23	2002	19.676	14.9	19.359	0.317	14.9	0

24	2003	21.591	16.2	19.359	2.232	16.2	0
25	2004	22.347	19.6	19.359	2.988	19.359	0.241
26	2005	31.741	27.1	19.359	12.382	19.359	7.741
27	2006	36.618	24.7	19.359	17.259	19.359	5.341
28	2007	39.43	37.1	19.359	20.071	19.359	17.741
29	2008	33.176	23.6	19.359	13.817	19.359	4.241
30	2009	25.228	19.4	19.359	5.869	19.359	0.041
Average		**28.5**	**25.12**	**-**	**-**	**-**	**-**

1167. As per Issue No. 37, the surplus water is available at Kotni site in 27 out of 30 years. Without going into the accuracy of the available water or the rationality of projected demand of water, it is observed that the Table-5 at page 82 of Volume 105(a) also indicates surplus water in 27 out of 30 years. However, the Tribunal has completed an analysis by using the inflow assessed by Prof. A. K. Gosain, in Table-4 at page 15 of Volume 193 and the results of the same are given in Table-6. From the results in Table-6, the surplus water is found to be available only in 23 out of 30 years.

1168. As per Issue No. 37, the minimum and maximum available surplus water with respect to 75% dependable flow are 2.421 tmc and 35.084 tmc respectively. As per Table-5 at page 82 of Volume 105(a), the minimum and maximum available surplus water with respect to 75% dependable flow are 0.317 tmc and 35.084 tmc respectively. However, as per the results presented in Table-6, the minimum and maximum available surplus water with

respect to 75% dependable flow are found to be only 0.041 tmc and 23.741 tmc respectively when the flow series estimated by Prof. Gosain is used.

1169. It is apparent that with the inflow series assessed by Prof. Gosain, the surplus water of 7 tmc is available only in 11 years out of 30 years. Further, in 7 out of 30 years, there is no surplus at all i.e., the surplus is zero. Obviously, the reliability of the facilities proposed to be planned with the surplus water is very much lesser than what has been stated in the Issue No. 37.

1170. The State of Karnataka has suggested transfer of 7 tmc of surplus water to Malaprabha reservoir. However, from Col. 5 of Table-5 at page 82 of Volume 105(a), it is apparent that the State of Karnataka, in fact, has considered 9.6 tmc of water for diversion to Malaprabha and not 7 tmc as suggested in the Issue No. 37 framed for determination.

1171. Without going into the accuracy of the available water, assessed by Prof. A. K. Gosain, Expert Witness of the State of Karnataka, indicated in Col. 16 at Table 4 of Volume 193 or the rationality of projected demand of water, the Tribunal observes

that 28.959 tmc of water proposed to be utilized / diverted from Kotni dam is even more than the average annual available water of 25.1 tmc which reflects a case of highly unsustainable planning.

1172. A very important aspect, which has not at all been examined by the State of Karnataka, relates to availability of space in the Malaprabha reservoir to store the surplus water from the proposed Kotni reservoir in specific years. On examination of the Working Table for Malaprabha project at pages 141 to 172 of the "Modified Detailed Project Report of Malaprabha Project" (Volume 33B), it is noted that out of 33 years i.e., from 1973-74 to 2005-06, the reservoir gets filled up to the full reservoir level (FRL) and water gets spilled over in as many as 16 years. Thus, in these 16 years, there is no space to hold additional quantity of water. When the information about the proposed diversion of surplus water from Kotni reservoir to Malaprabha reservoir as furnished in Table 5 at page 82 of Volume 105(a), is examined with respect to availability of space in Malaprabha reservoir, the Tribunal finds that in 11 years, the diverted surplus water cannot be stored in Malaprabha reservoir for want of adequate space because in these years the inflow

from Malaprabha basin itself is large enough and cannot be held in the reservoir fully and a part of it has to be spilled over. The details of year-wise surplus water from proposed Kotni reservoir and the status of the Malaprabha reservoir are furnished in the Table-7. In addition to the surplus indicated in the Volume 105(a), the Table -7 also indicates the surplus water assessed on the basis of the flow series developed by Prof. A. K. Gosain, in his Report of November 2016 (Volume 193).

Table-7: Year-wise Surplus Water Proposed for Diversion to the Malaprabha Reservoir and Status of the Malaprabha Reservoir

Sl. No.	Year	Surplus with respect to Flow Series in Vol. 105(a) in tmc [From Col. 6 of Table 6]	Surplus with respect to Flow Series in Vol. 193 in tmc [From Col. 8 of Table 6]	Status of Malaprabha Reservoir
1	2	3	4	5
1	1980	35.084	23.741	Reservoir Full
2	1981	11.203	12.041	Reservoir Full
3	1982	15.881	17.341	Reservoir Full
4	1983	10.534	3.941	Reservoir Full
5	1984	15.407	9.541	Reservoir Full
6	1985	0	2.941	
7	1986	1.029	0.741	
8	1987	0	0	
9	1988	15.405	8.641	
10	1989	3.814	4.241	
11	1990	17.95	14.741	
12	1991	8.435	6.241	Reservoir Full
13	1992	7.65	5.841	Reservoir Full
14	1993	6.627	4.841	Reservoir Full
15	1994	21.627	22.141	Reservoir Full
16	1995	1.368	0	

17	1996	0	0	
18	1997	10.896	8.941	Reservoir Full
19	1998	4.454	0.941	
20	1999	12.982	8.141	Reservoir Full
21	2000	7.307	0	
22	2001	1.038	0	
23	2002	0.317	0	
24	2003	2.232	0	
25	2004	2.988	0.241	
26	2005	12.382	7.741	

1173. From the above Table, it is observed that out of 26 years, the Malaprabha reservoir gets filled up in 11 years up to full reservoir level (FRL) and hence in these years, there is no scope of storing water by diversion from outside basin, in this case from Mahadayi basin. It is also apparent from the above Table, that some water could be diverted in 8 out of 26 years if the flow series derived by Prof. A. K. Gosain is considered. However, the proposed quantity of 7 tmc is available only in 3 out of 26 years. Obviously, the planning of schemes where objective can be met only in 3 out of 26 years is meaningless. It is apparent that the State of Karnataka has not prepared the Reports after considering all aspects and hence such Reports cannot be relied upon.

1174. The Tribunal is of the staunch view that schemes for drinking water supply must be planned from highly reliable sources, which have availability of water at 100% dependability. In this regard, a question was asked to Shri S. M. Jamdar, witness of the State of Karnataka. Question No. 2 put to Shri Jamdar on 29.11.2017 and the reply thereto are reproduced hereunder.

> "Q.No.2. At Para 11, page 12 of your Affidavit dated 9.11.2017 (Vol. 206), you have stated as under:
>
> "The plea of the State of Karnataka for transfer of 7 tmc of water to Malaprabha reservoir from surplus water at Kotni Dam for providing protective irrigation, drinking water needs etc. (as mentioned in the amended Statement of Claims dated 15.04.2015, page 122) will go a long way in mitigating the hardship caused to the inhabitants in drought prone areas in Malaprabha basin."
>
> In this regard, please answer the following:
>
> a. We understand that drinking water supply must be planned from highly reliable sources, which have availability of water at 100% dependability. How can the 100% dependability be ensured through the surplus water at Kotni dam which would generally be available only in those years when actual rainfall is more than the average rainfall?
> b. Surplus water cannot be considered to be available in each year and particularly during the drought years when there would be no surplus, at all. Therefore, it may not be appropriate to assume

that the plan to transfer such surplus water will help in mitigating hardship to the inhabitants during drought periods. As a matter of fact, such measures would only create false hopes. Have you examined all these aspects carefully? How such measures would help providing protective irrigation in mitigating the hardship of the inhabitants of drought prone areas during the drought period?

Ans. I wish to answer the question in two parts:

a. I am to state that the diversion of Kotni Dam water was not intended for drinking water supply. It was basically for power generation and protective irrigation in the drought prone areas. The word appearing in my Affidavit 'drinking water' is a mistake and I apologize for the same.
b. On question b I would say that during drought years, definitely there may be deficiency in the flow at Kotni Dam and consequently, deficiency in the quantity of water to be diverted for protective irrigation in the Malaprabha project. But that kind of risk has to be taken at least in the years whatever quantity of water is available will be useful."

[Emphasis supplied]

1175. In this regard, it is also noted by the Tribunal that at Para 1.3, page 40 of the "Modified Detailed Project Report of Malaprabha Project 2009", which is Annexure-4 to the Reply on

behalf of the State of Karnataka to the Statement of Case filed by the State of Goa (Volume 33B), the following has been stated.

> "The modified project was approved by the Government of Karnataka for Rs 162.09 Crores vide GO No. PWD 59 GMP 77 dated 04-02-1980.
> For drinking water for Hubli-Dharwad, Saundatti and Bailhongal water utilization is 1.08 TMC. And average evaporation losses (as observed) is 2.55 TMC."

1176. In view of the specific reply of Shri Jamdar that 'the diversion of Kotni Dam water was not intended for drinking water supply' and that 'it was basically for power generation and protective irrigation in the drought prone areas' and the information about specific allocations for drinking water for Saundatti and Bailhongal, the proposal for drinking water is not found as appealing at all and is hereby rejected.

1177. Regarding the use of 3 tmc for protective irrigation in DPAP areas of Ramdurga, Saundatti and Bailhongal Taluks in Belgaum district, is found that these aspects are also covered in Para 1.3 and Para 1.4, pages 39-41 of the "Modified Detailed Project Report of Malaprabha Project" – Annexure-4 to the Reply on behalf of the State of Karnataka to the Statement of Case filed by the State of Goa (Volume 33B). The relevant paras of the

"Modified Detailed Project Report of Malaprabha Project" (Volume 33B) are reproduced hereunder.

"1.3 Present Proposal

…

The Badami taluka of Bagalkot District, Ramdurga and Saundatti talukas of Belguam Dist., Navalgund of Dharwad, Naragund, Ron talukas of Gadag District are chronically know draught prone areas. The command is of fertile land with B.C. soil and some part of red soil which is also fertile for growing Ground nut, Jowar etc. The command area lies in the range of 600 meter. These areas are suitable for growing crops like Jawar, Ground nut, Maize and Sunflower. The crops proposed in the project are ·in conformity with agricultural practice, soil condition, suitability and availability of water."

"1.4 Details of canal system

The Malaprabha Canal system mainly comprises two main canals one on either bank of the river along with branches and net work of distribution system consisting of distributaries minors, water courses and ultimately field channels for carrying water to the last Sub-Division of the last survey number, and the distribution system for the 10 lift irrigation schemes. The canal situated on the right bank is called the Malaprabha Right Bank Canal and commonly referred to as "Malaprabha Right Bank Canal" and the one of the left bank as the Malaprabha Left Bank Canal termed as ''Malaprabha Left Bank Canal.

> In the present proposal construction of the Right Bank Canal for irrigating a total area 121392 Hacters in the districts of Belgaum, Dharwad and Bagalkot. The Malaprabha Right Bank Canal is 142 kilometer in length and had three branches namely (1) Nargund Branch Canal (2) Alur Branch Canal (3) Ron Branch canal. The area to be irrigated was spread over in the following eight talukas: (i) Ramdurga and (ii) Saundatti (Belgaum District) (iii) Badami (Bagalkot District) (iv) Navalgund and (v) Hubli (Dharwad District) (vi) Nargund (vii) Ron and (viii) Gadag (Gadag District)."

From the above, it is apparent that necessary provisions have already been made for irrigation for these areas in the "Modified Detailed Project Report of Malaprabha Project" of the year 2009, which is Annexure-4 to the Reply on behalf of the State of Karnataka to the Statement of Case filed by the State of Goa (Volume 33B). Therefore, the need to use additional 3 tmc for protective irrigation in DPAP areas is found to be superfluous and cannot be accepted and is hereby rejected by the Tribunal.

1178. The State of Karnataka has proposed for diversion of 2 tmc for irrigation in the areas duly covered under the existing command of Malaprabha Project. The related information provided in the "Detailed Project Report for Diversion of Surplus Water from Foreshore of Kotni Dam (MHEP) to Malaprabha

River" – Annexure 79(A) to the Statement of Claims of the State of Karnataka [Volume 105(a)] is as under.

> **"4.3 Utilization of 2 TMC of water for providing irrigation to suffering tail end atchkat of MLBC and MRBC command area**
>
> Malaprabha Reservoir was constructed for utilization of 44.00 TMC of water. But after studying the reduction in yield to the reservoir over several years, Central Water Commission has accorded approval for the reduction in yield and permitted to utilize only 27.00 TMC of water. Out of this total allocation, 24.234 TMC of water is to be utilized for irrigating 1,96,132 Ha of command area.
>
> Even after remodeling of canal system, the tail end areas are not getting sufficient water for irrigating the approved crops. As a result, the farmers are facing acute hardship in obtaining good yield from crops which has resulted in tail end farmers becoming economically weak and their unrest is expressed in the form of agitation, dharnas and sathyagrahas.
>
> It is observed that about 17,110 Ha of tail end command area of Malaprabha Project is not getting sufficient water for irrigation. The tail end suffering atchkat in Malaprabha Left Bank Canal is about 7,170 Ha and in Malaprabha Right Bank Canal is about 10,000 Ha. For catering to the needs of the suffering atchkat as per the present crop water requirement, the quantum of water required would be about 2.00 TMC.

> Hence, it is proposed to provide additional 2.00 TMC of water to the Malaprabha Command area from the present existing canal and distribution network. …"

1179. It is observed by the Tribunal that the Detailed Project Report of Malaprabha project was revised in the year 2009 and also duly approved on 9.10.2009. The State of Karnataka has not indicated the reasons for non-availability of water to the tail-ender farmers and the initiatives taken by the Government to address the issues. In general, the non-availability of water to the tail-end users result from poor management of the canal system. None of these aspects are explained by the State of Karnataka. Therefore, such a claim cannot be considered as well founded one and is hereby rejected by the Tribunal.

1180. The diversion of 1.14 tmc of water to Malaprabha river has been proposed to be used for recharging of ground water through the existing minor irrigation tanks by filling them twice in a year through proposed lift schemes at various suitable locations on the banks of Malaprabha River in Ramadurga, Saundatti and Bailhongal DPAP Taluks. As already indicated in Para 1177 above, the irrigation for Ramadurga and Saudatti Taluks etc. are duly covered under the "Modified Detailed

Project Report of Malaprabha Project" (Volume 33B) and therefore this claim also deserves rejection and is hereby rejected by the Tribunal.

1181. It is also pertinent to note that the quantum of water indicated in the "Project Report of Mahadayi Hydro Electric Power Project" – Annexure 70 of the Statement of Claims of the State of Karnataka [Volume 54(a)] i.e., 14.564 tmc has been found to be on very higher side and the Tribunal has assessed the water availability at 75% dependability as 8.01 tmc only. Obviously, the quantum of surplus water would come down drastically.

1182. At Para 3.7 (D), page 53 of the "Written Submissions on behalf of the State of Karnataka" (Volume 220), the learned Counsel for State of Karnataka has stated as under.

> "The State of Karnataka proposed to divert 7 tmc of surplus water of Mahadayi to the Malaprabha basin from Kotni reservoir. The surplus water of 7 tmc is actually water in excess or surplus to the 75% dependable flows at Kotni. The State of Goa cannot have any grievance against the utilisation of surplus water by Karnataka in its territory, because its plea is for division of 75% flow. It has not planned any project out

> of the surplus flow. Therefore, this Hon'ble Court may hold that by diversion of 7 tmc of surplus water by Karnataka from foreshore of Kotni, the State of Goa would not be affected prejudicially."

1183. In this regard, it is noted that the State of Karnataka has also pleaded for assessment of water at 75% dependability only, as is apparent from the Issue No. 33, which has been framed for determination by the Tribunal as requested by the State of Karnataka. The Issue No. 33 is reproduced hereunder.

> "33. Whether the State of Karnataka proves that the water availability assessment of the inter-State river Mahadayi should be for 75% dependable flow?"

Allocation of any quantum of water, over and above the water available at 75% dependability at Kotni dam site (in this case, allocation of water of 7 tmc stated to be in excess or surplus to the 75% dependable flows at Kotni dam site) to the State of Karnataka would not, at all, be justified, if the allocation of water share among the party States is restricted to the availability of water at 75% dependability.

1184. Further, the water which overflows from the reservoir during the monsoon period plays very important role in

maintaining the river regime in the lower reaches of the river and is also necessary from environmental point of view. In this regard, Para 3.3 of the National Water Policy 2012 states as under.

> "3.3 Ecological needs of the river should be determined, through scientific study, recognizing that the natural river flows are characterized by low or no flows, small floods (freshets), large floods, etc., and should accommodate developmental needs. A portion of river flows should be kept aside to meet ecological needs ensuring that the low and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use."
>
> [Emphasis supplied]

1185. In view of above, the Tribunal is of the opinion that the demand of the State of Karnataka in respect of proposed diversion of 7 tmc of surplus water from Kotni reservoir of the Mahadayi Hydro Electric Power (MHEP) Project cannot be accepted and is hereby rejected.

1186. The State of Karnataka has further pleaded in para 1.6 of the "Written Submissions on behalf of the State of Karnataka" filed on 15.1.2018 (Volume 220) that "the party States may be given the liberty to utilize the said water without acquiring any

rights until 2051 AD by constructing non-permanent projects". The Tribunal finds that the suggestion of the State of Karnataka is not supported by any study, worth name and even the basic information have not been provided, particularly the information related to (a) identification of so called non-permanent projects, (b) water balance studies at the so called non-permanent projects, (c) sustainability aspects, and (d) evaluation of social, ecological and economic impact of such non-permanent projects. As already discussed in detail in earlier paras, the Tribunal is fully convinced that all aspects are required to be examined in an integrated manner and that the aspects of sustainability and minimization of environmental harm are key factors for considering any project, and particularly for the purpose of equitable apportionment.

The Tribunal notices that the aspects of sustainability and minimization of environmental harm have also been emphasized in the "Berlin Conference (2004) – Water Resources Law" (MARK-KA/16) produced by the State of Karnataka itself. The Article 7 of the "Berlin Conference (2004) – Water Resources Law" (MARK-KA/16) states that "States shall take all appropriate

measures to manage waters sustainably". In the commentary on Article 7, the following has, inter-alia, been stated.

> "…
> Sustainability generally requires the conjunctive and integrated management (Articles 5, 6) of the waters of a water basin and the limiting of withdrawals to the safe yield of the each water source. The concept is also closely related to the precautionary principle (Article 23) that has become central to international environmental law. Exceptional circumstances only rarely allow deviation from these principles. At the least, sustainability requires viewing waters as parts of ecosystems that cannot be managed effectively except by giving careful attention to the intimate interconnections of the parts of the system. …"

The Article 8 of the "Berlin Conference (2004) – Water Resources Law" (MARK-KA/16) states that "States shall take all appropriate measures to prevent or minimize environmental harm". The commentary on this Article, inter-alia, states as under.

> "This Article sets forth the rule of customary international law regarding the duty of States to minimize environmental harm. This rule is intimately related to sustainability (Article 7), equitable utilization (Article 12), and the avoidance of transboundary harm (Article 16). Together these provisions express the complex of obligations that depend upon the nature of the harm resulting from activities relating to water. This

> Article recognizes a stronger obligation on States to minimize environmental harm compared to the *UN Convention,* in particular by recognizing that the obligation to minimize environmental harm does not depend upon the harm arising in a transboundary setting. This broader obligation in turn derives from general international environmental law. The International Law Association affirmed this relationship in the *New Delhi Declaration*. …"

Thus the sustainability of water resources and environmental protection have to be integral part of the planning process.

In view of above, the Tribunal finds that the suggestion of the State of Karnataka that "the party States may be given the liberty to utilize the said water without acquiring any rights until 2051 AD by constructing non-permanent projects", is not based on any study and without careful examination of all relevant aspects, particularly the aspects of sustainability of water resources and environmental protection. Therefore, the suggestion of the State of Karnataka cannot be accepted and is hereby rejected.