

**IN THE HIGH COURT OF GUJARAT AT AHMEDABAD****SPECIAL CIVIL APPLICATION No. 17841 of 2006**

With

**SPECIAL CIVIL APPLICATION No. 19734 of 2006**

With

**CIVIL APPLICATION No. 12538 of 2007**

In

**SPECIAL CIVIL APPLICATION No. 17841 of 2006**

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**HOSANG MIRZA - Petitioner(s)****Versus****STATE OF GUJARAT THR' CHIEF SECRETARY & 6 - Respondent(s)**

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**Appearance :**

MR MP SHAH for Petitioner(s) : 1, MS. KRUTIM SHAH for Petitioner(s) : 1,

GOVERNMENT PLEADER for Respondent(s) : 1-4.

NOTICE SERVED BY DS for Respondent(s) : 3-5.

MR HARIN P RAVAL for Respondent(s) : 6-7.

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**CORAM : HONOURABLE THE CHIEF JUSTICE MR.  
K.S.RADHAKRISHNAN**

and

**HONOURABLE MR.JUSTICE AKIL KURESHI****Date : 14/10/2008****ORAL ORDER****(Per : HONOURABLE THE CHIEF JUSTICE MR.  
K.S.RADHAKRISHNAN)**

When this application came up for hearing, learned Advocate General made available Report Vol.I and Vol.II of the Inquiry Commission. It is submitted that the Inquiry Commission was appointed by the Government under Section 3 of the Commissions of Inquiry Act, 1952. Commission was set

up consisting of Hon'ble Miss. Justice Sugnaben Bhatt, Former Judge of the High Court of Gujarat and Shri R.D. Soni, Retired Secretary(Narmada) and Director (Canal Systems), Narmada, Water Resources, Water Supply and Kalpsar Department by the State Government. Terms of reference are mentioned in the notification dated 17.8.2006.

We have perused the report submitted by the Commission. Commission has made inquires pertaining to protection of the reservoir and water management. Various other findings are recorded by the Commission.

Counsel appearing for the applicant petitioner however, tried to impress upon the Court that Commission has not taken into consideration various aspects of the matter including the view expressed by the Central Water Commission.

This Court in writ jurisdiction will not be justified in expressing opinion on this contention, since report has been submitted by expert Commission appointed by the Government

In the above fact situation, we dispose of these petitions with direction to the Government to take note of the findings, conclusions and observations made by the Commission and to take further follow up action.

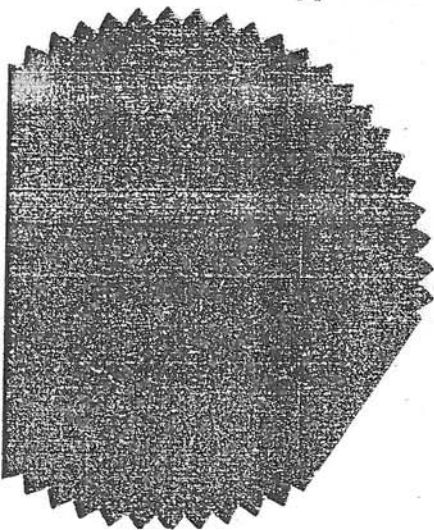
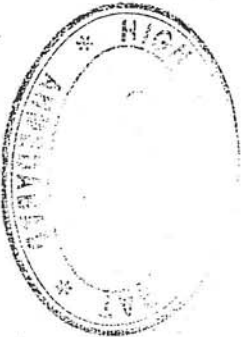
With above observations, petitions are disposed of. Civil application also stands disposed of.

*Sd/-*  
(K.S. RADHAKRISHNAN, C.J.)

*Sd/-*  
(AKIL KURESHI, J.)

TRUE COPY

*[Signature]*  
ASSISTANT REGISTRAR  
THIS DAY OF



- *as per the departmental procedure, pre monsoon and post monsoon inspections of the dam was carried out by the Executive Engineer and Superintending Engineer who have certified the health of dam.*

**20.6** The detail inspection notes issued by the Executive Engineer and Superintending Engineer are submitted under Exhibit 237 and 238. The Superintending Engineer in his affidavit has also reported that the dam was inspected prior to August 2006 flood by the Chief Engineer CWC (Dam Safety and Hydrology Studies Organization) Shri B.M.Upadhyay and Superintending Engineer of CWC Shri N.K.Mathur and they found them in order as they were fully satisfied. No notes on inspection were issued. It is also reported that a dam safety organization works under the Director, Gujarat Engineering Research Institute, Vadodara. This dam safety organization inspects major dams of Gujarat each year. The DSO had inspected the Ukai dam on 16.6.06.

**20.7 Conclusions drawn in respect of term of reference 2<sup>(iv)</sup>**

**The Commission is of the opinion that the dam authority has taken required appropriate steps to safe-guard the safety of the dam during the monsoon of 2006.**

**21. Recommendations**

**The Commission has given its conclusions term wise in forgoing paras. Below given are recommendations with regard to operation, maintenance and safety requirements of Ukai dam and measures for preventions and protections of the Surat City and flood plain areas from the flood flows of river Tapi.**

**1** The existing system of basic data collection is mainly manual. All observations viz. rainfall, gauge, discharge measurement, etc. The data collected is transmitted at different time intervals prescribed in Ukai Reservoir Operation manual. On the basis of prescribed in Ukai estimation is done by Surat office of CWC and communicated to concerned authorities. In the existing system there is always a time lag in collecting, communicating, calculating / for casting and dissipating the information on floods. This system is again infested with a problems of human errors at each stage which may some time result into incorrect assessment and forecast / predictions. The system needs to be replaced by Real Time Data Acquisition system (RTDAS), which may provide efficient, accurate and timely forecasting of floods, thereby more time for alerting the affected population and better mitigation of flood damages and saving of lives properties and rescue operations. It is recommended that the Real Time Data Acquisition System (RTDAS) should be implemented, i.e., installation of automatic gauges with sensors

transmitting the data directly to the control room through telemetry. The CWC has given some indication that they are planning to implement telemetry based forecasting system in all the river basins. It is further recommended that the system being implemented in the Sardar Sarovar may also be studied and govt. may pursue with CWC to implement RTDAS in Tapi Basin.

2 The present system of computation of flood flow is based on the gate discharge observation. Effect or response of a basin to a flood event resulting from a precipitation and its distribution in the catchment area is not taken into account in the forecast of volume of flow. If the flood flow forecast can be linked with the rainfall and its distribution, early prediction of the flood can be made. One of the methods is to develop a rainfall runoff co relation at a particular site of observation. The CWC has indicated that they are developing this relation for implementation in Tapi basin also. The govt. may pursue the matter with CWC.

3 It appears that between Sarankheda and Ukai (107 km), there are no rain gauge station in the catchment area admeasuring about 4000 sq. km. In this reach number of small rivers / rivulet's directly drain into Tapi river or Ukai reservoir itself, by traveling about 20-40 km in the hilly terrain. In the event of local heavy downpour, the flood water enters into the Ukai reservoir with a very small time lag, say about 2 to 3 hours only. The flood flows from such streams are observed to be sizeable (Annexure XXVII). It is advisable that a few rain gauge stations are developed by CWC with full facilities in the catchment between Sarankheda and Ukai. This would enable assessment of the inflow from the vicinity of the reservoir and would help in operating the dam more precisely. Also rain gauge station distribution could be improved to standards specified by IMD. //

4 The existing system of wireless communication is found working well. To meet with emergency situation installation of satellite telephone at governing stations during the monsoon may be considered.

5 During the flood event of August 2006, much variation in the forecast volume and actual volume is seen. Perhaps this is on account of substantial contribution from the intervening catchments for which no proper assessment is available. It would be appropriate that the data of rainfall, forecast volumes, actual volumes and reservoir level etc. available since the year 1972, may be evaluated to derive a reasonable approximate co-relation between forecast volume and the actual volume. This may also take care of the probable flash flood resulting from heavy rain fall in the intervening catchment area.

6 Ukai dam is in operation since the year-1972. It is suggested that a complete health check, investigation and analysis of critical areas and sections of the dam is done in house or if required, through a specialized

agency or experts. Further looking to the large scale economic development on the downstream side, safety of the dam is paramount. Any breach or break in the dam or appurtenant work can result into catastrophe. It is suggested that the dam break studies be carried out and detailed maps showing vulnerability to such incident be prepared. This will enable the authority to foresee the extent of damages and also prepare Emergency Action Plan. Similar studies for flood protection embankments around Surat is worth undertaking.

7 The Ukai dam project is bringing in substantial returns as well as increase in agricultural productions. Details of the benefits derived from the water of Ukai dam are compiled in **Annexure XXV**. Also, the details of expenditure on maintenance for the last five years on maintenance of the dam are shown in **Annexure XXVI**. Quantum jump in expenditure on maintenance since the flood of the year 2006 is seen. The Commission feels that enough fund should be made available to the dam authority for up-keeping health of the dam, particularly, when it is a source of a good revenue and safety of large scale economic infrastructure downstream depends on stability of this dam.

8 Apparently the dam specific operation and maintenance manual does not exist. The dam operator has to act for maintenance and repairs with knowledge available to him. The well drafted maintenance manual provides complete guide lines drawn with consideration of material used methodology of construction, design parameters etc. The Commission recommends that dam maintenance and operation (not reservoir operation manual which already exists) manual be developed to assist dam operator to attend repair and / or maintenance activities correctly.

9 During the site visit of Ukai dam as well as from the information on organization available at the dam site, given by the project authority, it has been seen that some critical operating posts are vacant since long, particularly, at the level of Executive Engineer, Deputy Executive Engineer and down below. Also considerable numbers of senior experienced operators and supervisors are superannuated and only few available may retire soon. It is emphasized that dam operating organisation is strengthened by deploying experienced personnels of required disciplines.

10 As per the normal procedure, pre-monsoon and post-monsoon inspections are done regularly by the local officers as well by the Dam Safety Organisation of the state. The Central Water Commission, New Delhi, has issued guidelines for 'safety inspection of dam' in June-1987. These guidelines outline the principal factors to be conceding in determination of the existing or potential hazard and the scope of activities to be undertaken in this safety inspection. The Commission believes that the safety inspection of dam

is done following these guidelines. If not, the government may adopt the guidelines issued by the Central Water Commission. The Commission feels that the inspection report should be thoroughly and timely scrutinised and the deficiency observed should be attended timely. It is further suggested that complete and thorough inspection of the dam to check its health be carried out with inhouse capability or through expert organisation or a team of experts at regular intervals, say at every 3 to 5 years.

11 The dam service facilities like lifts lighting approach edits, drainage gallery, control cabins etc. are not up to mark and ill maintained. All facilities needs to be improved. . It has been seen that the security arrangement for safety of the dam has a scope for improvement. Occasionally, it is enhanced during the flood time or war period or emergency. To safeguard the dam against any sort of attack or sabotage or large scale damage by miscreants improvement of security, surveillance and vigilance system may be considered.

12 The downstream slope protection i.e. turfing needs to be improved. Also dam instrumentations installations being very old are not functional or not reliable. The govt. may consider to improve or change existing instruments if possible or else provide alternative arrangement.

13 For operating the reservoir, there is a Reservoir Operation Manual 2000, which is required to be updated after five years but it is still not revised. While revising it, the effect of high tide, flash flood from intervening catchment flood -situation created by accident like earthquake collapse of some appurtenant facility, etc., may be taken into consideration, if technically feasible. The Commission visited two dams built by Maharashtra State across river Tapi at Prakasha and Sarankheda. The Commission was informed that similar 3 or 4 dams are coming up on the upstream of Sarankheda. As such, operations of these dams will govern operation of Ukai reservoir. The Commission feels that while revising the Ukai Reservoir Operation Manual, the development on the upstream side should also be considered.

✓ 14 The present rule levels are giving priority to the irrigation requirements. The project is designed with carry over capacity. This provision could be operated at a later part of monsoon season and to that extent, the rule levels can be lowered which will provide some extra cushion for absorbing the flood but with some risk of monsoon failure. This possibility may be critically examined while redrafting the operation manual.

✓ 15 Uncontrolled excessive release of huge amount of water may result into loss of life and damage to the property due to excessive flooding. Such

situation can occur either due to breach in the dam, earthquake, land sliding, sabotage, extreme storm conditions or any natural calamity. To meet with such an eventuality, an action plan to cope with such an emergency needs to be drafted. The Ministry of Environment & Forest, through its notification No. SO/ 60 (E), dated 27-1-1994, has made the disaster management plan or emergency action plan (EAP) a mandatory requirement. For preparing an Emergency Action Plan (EAP) for the dam, guidelines are issued by the dam safety organization of the CWC in the month of May 2006. The Commission believes that such EAP exists for Ukai dam. If not emergency action plan must be developed.

16 The Commission has observed, directly or indirectly, that the dam authority has some reservation in utilising the flood cushion provided between FRL 345 ft and MWL 351 ft. Only on one occasions prior to 2006 water level is raised above 346 ft.. It is suggested that if required investigation should be carried out to check and establish stability of the flood cushion provided between 345 ft and 351 ft. Also it is informed that the raising of water level up to MWL 351 ft may affect some villages of Maharashtra. The dam authority was silent on this issue. The Commission suggests that this issue may be investigated and settled so as to enable use of this space in future, and if the affected villages are in other State, the issue may be resolved with the concerned State Government.

17 Some individual / institution have brought out that the dam has a free board of 17 ft above the MWL of 351 ft; therefore, the reservoir can be raised upto 351 ft. The Commission feels that issue of use of flood cushion needs critical examination to come out with firm policy statement.

18 The releases from the dam are based on FBRO calculations and decision for releases is responsibility of the Chief Engineer. The Commission feels that a group or a committee of experienced senior technocrats of level of Chief Engineer be formed to evaluate flood situation and decide requirement of releases instead of leaving it to a single concerned incumbent. The arrangement suggested will definitely result into precision and avoid error of human judgment or competency.

19 It was informed that the stop logs and gantry crane installed on the top of the dam were never used since Commission of the dam. Also, the health status of the stop-log and gantry crane were not good. The stop-logs and gantry crane are crucial facility for emergent repairs of spillway gates. Therefore they should always be operational. The Commission suggests regular drill for such crucial elements of the projects. Incidentally, it may be mentioned here that the metal works at Kakrapar weir is extremely in bad shape, particularly, the gantry crane, stop-logs, sluice gates etc. Similar

conditions prevail at Moticher escape regulator near Kakrapar Atomic Power Station.

20 The Commission has reached to a conclusion that historically, Surat city suffers high flood almost every 4 to 5 years. This has been well established by various studies and reports. In order to protect Surat city upto flood of 8.5 lac cusec, an embankment scheme was taken up, when the river channel capacity was about 4 lac cusec. But now the channel capacity has reduced to almost 2.5 to 3 lac cusec. It has been well established that the unplanned development in the flood plain area and the large scale encroachment in the river channel have reduced the carrying capacity, whereby the water levels are going higher and higher with lower and lower discharges creating flood problem almost every year when the flood flow exceeds about 2.5 lac cusec. The Commission firmly believes that unless strict measures are enforced to restrict further development in the Surat city along banks, flood plains, along banks and Hajira area, the problem of flood and damages will be aggravated dynamically year by year

21 The encroachment into the flood plains since completion of Ukai dam has taken place on large scale and needs to enforce effective and sustained measures to control the development activities in such area, may be by putting in place a techno-legal regime by enacting special law to prevent this type of development.

22 Flood mapping and flood zoning activities should be immediately taken up which shall include marking of flood plain areas on maps, preparation of close contour flood map, identification of priority flood protection and drainage improvement works etc.

23 All the on-going constructions, projects, buildings and infrastructural projects shall be reassessed for determining the extent of obstructions to flood and raising of water level. If such projects or construction activities obstruct the flood flow, the same will need to be stopped, or design need to be changed to avoid obstructions to flood flow.

24 Detailed investigation and survey should be carried out for identifying alternate routes for diverting parts of flood along the probable existing low-lying areas connecting to Sea or river or the low lying channels creek, and khadis like Tena Khadi and also replacement of existing ungated weir at Singanpor by gated weir will provide better hydraulic design with increased capacity, reduced afflux and may avoid silting. This may be examined for implementation.

25 The Commission has observed that a lot of low-lying areas belong to government which are being released for development without giving due consideration to the flood effect. Such areas need to be identified and reserved and declared as 'agricultural zone only'. The government may also consider of acquiring such low-lying private area to facilitate diversion of



floods. The Commission is of the firm opinion that all kharland area, Khadi area, creek area, and large portion of flood plain areas belong to govt. who should not hesitate to impose required restrictions in the interest of safety of lives and properties of the people.

26 The existing Development Control Rules and building bye-laws of SMC, SUDA and other authorities should be modified to cater for flood flows. Such modified rules shall be drafted with specific provisions for observance of flood vulnerability of the area.

27 Urban flooding is now common phenomenon as drainage routes are blocked or encroached by the development, similar is the situation in most of the flood plain areas, more particularly in Tapi river flood plains. The Commission is of the opinion that this is attributable to non existence of appropriate development rules taking care of geographical, topographical and morphological requirement of the area or what ever small rules prevail they are not observed or implemented. Further uncontrolled development in the flood plains and Surat city may continue if they are not checked. The Commission is of the opinion that a separate technically competent empowered authority to look after the requirement of drainage of rain / storm water and flood water to avoid urban area flooding and also to control and monitor development activities for maintaining original flood plain areas open and clear. Such authority should also be empowered to control or change development plans including town planning schemes for keeping free existing drainage, waterways, existing ponds, Khadis, creeks and also the future diversion waterways, low lying areas and channels etc.

28 The Commission recommends that the development of Tapovan farm on Bhata bet (already covered in interim report) and similar development proposed or undertaken in delta regions or low lying areas should be reexamined with respect to flood hazard in such areas.

29 The Commission also recommends that development activities should not be allowed to obstruct existing major water ways or drains.

30 The Commission has seen large scale encroachments of flood flow area by construction of compound walls that too, with a height of 2 to 3 m covering the entire plant area. The Commission is informed that critical length across the flood flowing area is almost exceeding 4000 m and 2 to 2.5 m in

height. The authority should enforce enough water way through such walls or by some other means, say barbed wire fencing, to clear large encroached water way Any new development may not be permitted to adopt solid compound wall. This is also applicable to the new infrastructure developments like roads, railways, etc.

31 The Commission has noted that the observed level of flood at Magdalla bridge was about 9.0 m while the entire Hajira area is between 4 to 5 m, which is vulnerable to flooding even at a much lower discharge of 4 to 5 lac cusecs. The right bank of the river Tapi beyond Nehru bridge has an elevation of about 4 to 6 m which acts as a spillway during flood allowing the water to spread in the flood plain areas. Before raising of this bank or dredging of river channel, it is advisable to take up sufficient investigations, hydrological studies, physical or mathematical model studies to assess effects of such development on upstream side and flood flows.

32 The Commission has observed that different agencies like HUDA, SUDA, HADA, Collectorate, G.I.D.C., etc are governing development activities. The Commission feels that uniform elaborate development or construction rules for SUDA and Hajira area are framed, taking into due consideration the vulnerability to floods, geographical location, elevation, etc. It appears that there is lack of coordination in respect of preparation of development plans and permission for construction activities. It is essential that a single controlling authority or development authority is created for Hajira Industrial area who can control and monitor the development activities.

33 This Commission is of the opinion that no solid construction should be allowed up to a level which the recorded flood has achieved. For compliance the structure may have to be suitably designed for keeping the area between ground level and flood water level open for free flows.

#### 34 Special Comments and Recommendation.

In the foregoing paragraphs, the Commission has given its conclusions as well as recommendations. The Commission desires to give its express opinion about management of dam and express measures required to control development in the flood plain areas as under: -

The logging of water in the city of Surat during the flood of August-2006, has necessitated the government to review the reservoir management of Ukai dam by appointment of this Commission. One has to keep in mind that Ukai dam's priorities are irrigation and hydraulic. Consequential control of flood does not change the priority of dam management. If one looks back at the history of Surat city, then it is a low basin area which is pro-flooding and has

flooded the city more often than not prior to the dam construction. So, any consideration of the water management of Ukai reservoir will not be in a position to change and should not change the priority of Ukai dam.

After giving deep consideration to the management of reservoir water during August-2006 and thereafter the monsoon of the year-2007, the Commission feels that the person who is in charge of management of the dam during the monsoon should be a person who has successfully managed the crises of the dam in monsoon. According to the Commission, the canals and dams are the assets of Gujarat State and they need to be preserved at any cost; so, we feel that even though the administrative exigency may require the government to transfer a person at the regular interval, but the technical person in charge of the important technical institution during the period of crisis should be given the charge to the person who has successfully managed the institution during the crisis period. The reason being that the team which has successfully managed the crisis, has the feel of situation and can control the management for better. Again, we are of the opinion that for the management of a dam and the like institutions, no single person should be left with the decision which affects safety of either the dam or institution. We feel that there should be a Committee of experts who may be made available on the spot during the monsoon period. So, in case of failure of a single individual either to take his decision or to be available, there should be a team of persons at the site who can take decision for managing the crisis. Thus, we strongly feel and recommend that a team of experts should be made available at the site of dam during the height of monsoon where in case of over-flooding the water, they can jointly arrive at the decision and manage the things better.

It has come to the notice of the Commission that Tapi river bed has the obstruction, which might be well highly impossible to remove. In our interim report, we have pointed out the escape route of Tapi which needs to be preserved for future. This includes the route which may be available for diverting the water and no obstruction should be allowed to be created in its way. Thus, granting of lease to any individual industrial house to carry out construction, one has to see that the water shall have a free course of run without flooding the city. If this is not guarded well, the future of the city is dim in dark. The Hajira industrial area needs to be supervised very seriously while granting any permission of construction to any party and all the three authorities, i.e., Urban Development, Surat Municipal Corporation and Hajira authority, have to apply mind to see that before giving permission to any plan of construction, it should not obstruct the free run of water during the time of crisis. Alternatively, there should be appointment of a competent authority of the area who can summon these three authorities for the respective area for supervising the construction, that should not block running of water. We also feel that the Surat Municipal Corporation is required to be told in no uncertain terms that it is required to take very serious and firm steps towards the offending individuals who do not conform to the bye-laws of construction. This

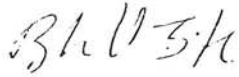
gives the strict implementation of the local laws. It has also come to our notice that the sewage opening in the river bed would affect silting of the river bed which has made the river bed shallow. The Corporation needs to plan alternatively, to direct the sewage by pipe line directly up to the opening of sea where it does not affect the silting of river bed.

While granting this building permission, competent authority has to verify whether the water level and the under current water level has been kept open in plan and this needs strict supervision by either the SUDA or SMC. A competent management of the reservoir and Ukai may control the release of water of Tapi river to some extent, but the water management of the Surat city is the responsibility of Surat Municipal Corporation, SUDA and the government authority. They have to see that the natural course of running water gets its route clear to pass effectively and quickly.

It is also suggested that there are knowledgeable people in the city who have study of management of different land levels of the city and the flood management. They have different kinds of maps to suggest alternatives like the Citizen Council, who has good study of geography of the city and its water management. One has to keep in mind that the objection does not always mean opposition. If a person has knowledge, he or she should be welcomed to guide the government for the better management. If it has been brought to our notice that the contour maps are the necessities of the day, whereby the Collector, sitting in his office can see how much flow of water can create how much clogging at what levels. The contour map is the necessity for the S.M.C. As suggested in the interim report, the Corporation should go for a contour map. The Urban Development authority was invited to participate for the same purpose, but unfortunately, the authority did not remain present. This suggests that the government should provide the Surat Municipal Corporation a contour map so as to facilitate them better for the flood measures. Experts in the subject should be made partners in the management and should also be Committee Members for recommendations of better crisis management.

With this, we present our final report of inquiry for consideration of the Government along with the documents and evidence considered in volume no. 2.

July - 7, 2008  
Gandhinagar

  
(Ms. Justice Sugnyaben K. Bhatt)  
Chairperson

  
(R. D. Soni)  
Member