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FURTHER REPORT OF THE FIVE MEMBER GROUP ON CERTAIN ISSUES RELATING TO THE SARDAR SAROVAR PROJECT

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Note: Appendices referred in this document are not reproduced here.

I. INTRODUCTION

(1.1) Our Report on various issues relating to the Sardar Sarovar Project (SSP) was handed over to the Secretary to the Government of India, Ministry of Water Resources (in a sealed cover, as directed by the Gujarat High Court) on 21 July 1994. It remained confidential until the Supreme Court ordered that it may be made public. Thereafter in an order dated 24 January 1995, the Supreme Court decided to refer certain issues (hydrology, height of the dam and resettlement and rehabilitation of oustees including environment) to us for a further report to be submitted in a sealed cover to the Registrar of the Court by 28 February 1995. This was communicated to us individually by the Government Advocate in the last week of January 1995 (Appendix I(IV)).

(1.2) However, work on this could not start immediately, because the Convener of the Group Dr. Jayant Patil wrote to the Secretary, Ministry, of Water Resources deeply regretting his inability to undertake this onerous work in view of the state of his health following recent surgery. This was reported to the Supreme Court, and the Supreme Court in an order dated 9 February 1995 desired the remaining four members of the Group to proceed with the work and (directed that Secretary, Ministry of Water Resources, may act as the (non-participating) convener of the Group to assist the Group to complete the task (Appendix I (2)). Accordingly Secretary, Ministry of Water Resources convened meetings of the Group on 16 and 17 February 1995, at which the Group made a careful assessment of the work involved and the time needed for its completion, and came to the conclusion that it would be able to submit its report by 31 May 1995. This was conveyed to the Convener in our communication dated 17 February 1995 (Appendix I (3)). However, the Solicitor General in a communication dated 24 February 1995 (forwarded to us by the Government Advocate) informed us that the Supreme court wanted to know whether we would be able to submit our report by 17 April 1995 at the latest (Appendix I (4)). We considered this carefully, and, having regard to the sense of urgency which had weighed with the Supreme Court in making this request, decided that we should comply with it, even if the compression of the time available meant that the report may fall short of the coverage and depth of examination which we would have liked to attempt. This was communicated in our memorandum dated 27 February 1995 (Appendix I(5)) and this was accepted by the Supreme Court vide the Supreme Court's Order dated 1 March 1995 (Appendix I(6)). It is in pursuance of that undertaking that this Report is being submitted.

(1.3) This is a supplementary Report and has to be read with our earlier Report which it does not replace or supersede except where specifically so indicated. That Report contains many observations and recommendations which need careful and urgent consideration. While action on that Report, submitted in July 1994, was (understandably) delayed because it was kept in a sealed cover, that difficulty has since been resolved, and we hope that the processes of decision-taking and implementation are in progress.

(1.4) The issues referred to us by the Supreme Court are dealt with in the ensuing chapters. In our examination of these issues we have taken into account the submissions made to us in accordance with the directions of the Supreme Court by the Government of India (Ministry of Water Resources), the Governments of Gujarat, Madhya Pradesh, Maharashtra and Rajasthan and the Narmada Bachao Andolan, and also some supplementary material provided to us by the Ministry of Water Resources at our request. We also received some communications from other sources which we took note of to the extent relevant or appropriate. All the material received by us has been enumerated in Appendix I(7). The material itself is being passed on to the Ministry of Water Resources for record.

(1.5) In the present Supplementary Report, unlike in the main Report, complete unanimity, has not been possible. Wherever there are differences of perceptions or views within the Group, these are clearly indicated.

(1.6) We gratefully acknowledge the support and assistance extended to us by the Ministry of Water Resources in the performance of our task. In particular we would like to place on record our appreciation of the invaluable assistance provided by Shri M.S. Menon, Member (Civil), Narmada Control Authority and his staff. We must also mention the enormous burden we imposed on Shri R.S. Rawat of NCA by way of secretarial and word-processing assistance and his untiring efforts to meet our requirements. Shri R.P. Chugh provided the necessary logistical support with smooth efficiency.

II. HYDROLOGY

2.1 The Point of Reference

We formulate the issue as follows: What is the Group's view on the debate on the 75% dependable annual flow in the Narmada for the purpose of the SSP? Is it 27 MAF as assumed by the NWDT, and as maintained by the Government of Gujarat, the Central Water Commission and the Ministry of Water Resources, or 23 MAF as argued by the Government of Madhya Pradesh and the NBA? What bearing does the decision on the question of flow have on the project?

2.2 Hydrological Basis for Project Planning

(2.2.1) At the outset it may be useful to set forth briefly the prevailing practices in regard to the hydrological basis of project planning. The guidelines issued by the Central Water Commission for the preparation of such projects stress the importance of run-off data of the necessary length. With reference to a classification of projects as A1 to A4, minimum lengths of data required have been indicated as 10, 25 and 40 years. Where rainfall data are available for a longer period than observed flow data, a rainfall-runoff coefficient can be worked out for the later years and applied to rainfall data for past years to derive runoff data for those years, so as to extend the available runoff time-series. This procedure is known as 'hindcasting'. We are informed that this is an established and internationally accepted practice. On the basis of runoff data (observed or hindcast or a combination of the two) the flow is assessed with different degrees of 'dependability': '50% dependability' means that a flow equal to or more than the assessed flow would be available in 50 out of 100 years and '75% dependability' means that a flow equal to or more than the assessed flow would be available in 75 out of 100 years. It has been the practice in India to plan major irrigation projects on the basis of '75% dependable flow'. On this point, the following observations of the Central Water Commission in their paper entitled "Sardar Sarovar Project - Availability and Plans for Utilisation of Narmada Waters" (April 1993) are relevant:

'In India, the Irrigation Commission has pointed out in its report (1972) that "the farmer should be assured of getting the designed supply in 75% of the years and the existing practice in Indian conditions of planning irrigation schemes on the basis of 75% dependability should continue". Where a carryover is provided, the 75% dependability can be figured out, taking into account the carryover. Later, on the basis of the report of a sub-group on agricultural development regarding clearance of major and medium irrigation projects, the then union Ministry of Agriculture and Irrigation indicated in November, 1975 that: "Money spent on scarcity relief should be taken note of in assessing socio-economic benefits of projects and the present criteria of 75% dependability; may be continued for Major Irrigation Projects. In the case of Medium Projects, the criteria can be relaxed to 50% dependability for the supplies". As per the decision of November, 1975 relaxing dependability criteria to 50% in case of Medium Irrigation Projects serving drought prone areas and as per Irrigation Commission (1972) recommendations that availability can be improved by providing carry over capacity in storage reservoirs at an additional cost, the then Ministry of Irrigation indicated in 1983 as follows:

"This indirectly means provision of a higher storage than is possible with 75% dependability. In the context of the recommendation of the Irrigation Commission, it is considered desirable that both in the case of Major and Medium Reservoirs in drought prone areas, a suitable carry over storage, may be provided taking into account permissible dependability factor and subject to the normal adopted cost-benefit considerations. It is suggested that in all future projects, this aspect may be kept in view while formulating the proposals".

This practice of planning the water projects is being followed.'

2.3 SSP : Assessment of flows

(2.3.1) The utilisable flows in the Narmada have been assessed by various authorities or agencies at different times in the context of the prolonged inter-State dispute on the sharing of the waters.

(2.3.2) The Khosla Committee had data of observed flows for only 15 years (1948-62) and extended this series by hindcasting for the years 1915-16 to 1946-47. This gave a 75% dependable flow of 28.72 MAF. It must be noted that the Committee had observed as follows:

“It is apparent that in the early years of records, the density of raingauges was not adequate to fully represent the catchment. However, from 1931 onwards, the density has improved in various sub-catchments excepting the small reaches between, Punas-Barwaha and Hiranphal-Navagam, where the improvement has been only in recent years since 1951”. “There is no significant difference between rainfall value obtained with 1931 raingauges and those obtained with raingauges existing in the period 1948 to 1960. As indicated by this study, the construction of runoff series could be considered adequate if extended backward only upto 1931. This provides a long enough series for yield analysis and has the merit of not appreciably vitiating the reliability of the series by inadequacy and mal-distribution of raingauges which existed in the years prior to 1931”.

However, in a later paragraph (5.25) the Committee took note of the point made by the Madhya Pradesh Government that the period 1931-62 did not cover some important drought cycles (years of low rainfall) and “decided that the runoff series should be projected back to 1915 to give a fair presentation of the rainfall runoff cycle.”

(2.3.3) Despite the Report of the Khosla Committee, differences among the State Governments persisted on various aspects. Further inter-State discussions continued, and in August 1966, at Official Level Discussions on a number of technical issues, an agreement was reached among the State Governments on the quantum of utilisable flows in the river at Navagam. This was to the effect that “for present planning, the 75% dependable flow of the river at Navagam may be taken as 27 MAF” and that allowing for evaporation losses from major and medium reservoirs and minor tanks (-4 MAF), regeneration or return flow (+2 MAF) and the effect of carry over storage of 5 MAF (+3 MAF)*, “the net utilised flow to be adopted for present planning, may be taken as 28 MAF”. Differences on other matters, however, persisted leading eventually to the establishment of the Narmada Water Disputes Tribunal in 1969. In 1971, the Tribunal framed the following issue as Issue No. 7: “What is the utilisable quantum of the waters of the Narmada at Navagam dam site on the basis of 75% and other dependability?” In July 1974, the Chief Ministers of Madhya Pradesh, Maharashtra, and Rajasthan and the Adviser to the Governor of Gujarat came to an agreement of which Clause-3 was to the following effect:

“The quantity of water in Navagam available for 75% of the years may be assessed at 28 MAF and that the Tribunal in determining the dispute referred to it may proceed on the basis of this agreement”.

The Tribunal considered this agreement and in its judgement of 8 October 1974 decided as follows:

“We accordingly accept the agreement of the party States on this issue (i.e. Issue No. 7) that the quantum of waters in Narmada at Navagam dam site on the basis of 75% dependability should be assessed at 28 MAF”.

At the request of the party States, the Tribunal also accepted and took on record the annual yield series at Mortakka and Garudeshwar sites which had been agreed upon by the technical experts of the State Governments in November 1974 and incorporated this in its Report as Table 4.3 (Exhibit C-3). There is a note below this table which-says that “figures prior to 1948-49 are based on; hindcast series and for 1948-49 to 1969-70 are observed flows at the concerned sites.”

(2.3.4) It is clear from this that the Tribunal did not undertake an independent determination of the flows, but accepted the agreement among the States on the quantum of allocable flows. However, as it adopted that figure and made it a part of the Award, it is fair to regard 28 MAF as the flow determined by the Tribunal. (For certain further calculations made by the Tribunal taking 28 MAF as the starting point, please see Chapter III/ paragraph 3.2.2).

(2.3.5) Subsequently, as a longer time-series of observed flow data became available, and these by themselves (i.e. without backward extension by hindcasting) seemed to indicate a 75% dependable flow of only 23 MAF, doubts began to be raised in some quarters whether the assessment of 28 MAF was correct. However, the Government of India and the Government of Gujarat have in their submissions referred to a study carried out in 1991 by the

* As we mention later (in Chap.III, paragraph 3.2.2), the Tribunal observed that “the figures adopted for evaporation, regeneration and carry-over had not been derived from any detailed studies” (Report, Vol.II Chapter XI, paragraph 11.2.1).

Narmada Valley Development Authority of the Government of Madhya Pradesh which came to the conclusion that the hydro-meteorological cycle for the Narmada Basin at Garudeshwar was 79 years, and that the 75% dependable yield for a cycle of 79 years would work out in the region of 27.64 to 27.89 MAF. The Central Water Commission also went into this question in 1991 at the instance of the Narmada Control Authority, and endorsed the Tribunal's determination of 28 MAF; that paper was referred to in our earlier Report. In the present Report we shall be referring to a later paper (April 1993) of the Central Water Commission which had not been made available to us when we were writing our first report.

(2.3.6) Charles Howard & Associates Ltd., a Canadian firm of water resource engineers, was consulted by the "Independent Review" (Morse Commission) appointed by the World Bank and they provided a Report entitled "Sardar Sarovar Project - Hydrologic Assessment" in July 1992*. That Report subjected the streamflow data to certain tests and came to the conclusion that it was suspect; they also found considerable divergence between the observed flows and the flows derived by the hindcasting procedure for the same periods. They thus questioned both the quality of the observed data and the reliability of the hindcast data, and suggested more analysis. (An extract of paragraph 5 on the "Consistency of Hydrologic Data" from the Howard Report is given in Appendix II (1). The letter forwarding the Report observed that "there are now enough new data, and sufficient time, to make improvements". These criticisms formed the basis for the Morse Commission's own observations on the hydrology aspect of the project and their judgement that it "will not perform as planned".

(2.3.7) The controversy regarding water availability led to the preparation of a paper entitled "Sardar Sarovar Reservoir - Availability and Plans for Utilisation- of Narmada Waters" by the Central Water Commission in April 1993 (Copy attached as Appendix II(2)). By this time flow data were available upto 1989-90. In this paper the CWC gives the 75% dependable flow based on the observed data alone (1948 to 1990) as 23 MAF and that based on a combination of hindcast data (from 1891-92 to 1947-48) and observed data from (1948 to 1990) as 26.6 MAF. The CWC proceeds to observe as follows:

"Statistically, 40 years data length is considered adequate for assessing utilisable annual flows within +/- 5% error band, provided the coefficient of variation of annual flows is less than 0.20. In the case of Narmada basin, the coefficient of variation of annual flows is larger, being around 0.35, requiring data length of over 130 years for assessing utilisable flows within +/- 5% error band".

It has also been stated that in accordance with the World Meteorological Organisation's Operational Hydrology Report (WMO No.356) on "Application of Hydrology to Water Resources Management (Planning and Design Level)" by V. Klemes, the sample size required for limiting the standard error to 4% when the coefficient of variation is 0.40 is 100 years.

(2.3.8) The controversy also led the World Bank to commission a study by the Wallingford Institute of the U.K. That Institute in its Report No.EX-2824 of May 1993 rejected the criticisms of Charles Howard & Associates as well as the Morse Commission and concluded that "the primary flow record is sound overall and fit for the purpose to which it has been put"; that "the lower virgin flows since 1949 do not constitute an emerging trend but rather a consequence of a natural variability"; that "among the different segments of the series analysed by CWC, the 100 year record is considered the most useful as a basis for allocation of water shares among States"; and that "it yields a 75% dependable annual flow of 32.9 BCM (26.6 MAF) which confirms the value of 27 MAF used by the Tribunal". (Relevant extracts from the Wallingford Report containing comments on the Howard Report and the Morse Commission are given in Appendix II(3)).

(2.3.9) The World Bank, in their draft Project Completion Report of September 1994, observed as follows:

"The Narmada River hydrological series were reviewed during appraisal, and again in 1992 by the Borrower's Central Water Commission (CWC) and the Bank's consultants, after the Independent Review report raised some doubts about their accuracy. All reviews have concluded that the basic hydrological data used for the design of the project are satisfactory".

* The Howard Report of July 1992 and the Wallingford Report (May 1993) referred to in paragraph 2.3.8 below were also not within our knowledge at the time of writing our first Report.

2.4 Submissions to the Group

(2.4.1) Both the Government of Gujarat and the Government of India take the view that the utilisable flow in the Narmada has been looked into several times by experts and is a settled issue; and that there is no need for any further review on hydrology. The Governments of Maharashtra and Rajasthan are also of this view. The Government of Madhya Pradesh argues that the observed flow data will always be far more reliable and precise than derived/hindcast figures; that the rainfall data prior to the year 1931 was considered unrepresentative even by the Khosla Committee in 1965; and that from the figures now available, the utilisable flow comes to about 23.5 MAF.* The Narmada Bachao Andolan (NBA) in their submission argue that a 42-year series of observed data is sufficient for project planning and significantly longer than the series used for several projects in India. They also suggest that the hindcasting as currently done appears to result in significant over-estimation of runoff for the period 1891-1948 and needs to be redone using the observed data series 1948 to 1990, or else abandoned altogether as unnecessary.

2.5 Our Examination

(2.5.1) We have examined the material submitted to us carefully and tried to reach conclusions. There is a difference of views within the Group on this matter. There is no disagreement whatsoever in regard to the need for a long enough time-series of data as a basis for project planning, or the legitimacy of the hindcasting procedure where needed and where reliable rainfall data for past years are available. However, differences arise in regard to the need for hindcasting in the present case, and the acceptability of the results arrived at by a combination of hindcast and observed data when these results differ significantly from observed data alone. While there can only be one of two possible conclusions (27 MAF or 23 MAF), the reasoning through which the conclusion is arrived at can proceed on different lines. The thinking of the different Members of this Group on this subject is set forth below.

(2.5.2) Prof. V.C. Kulandaiswamy's View

(2.5.2.1) The issue crystallises into a choice between the following two alternatives for Sardar Sarovar system: (i) a 75% dependable flow of 27 MAF as envisaged in the NWDT award or (ii) a 75% dependable flow of 23 MAF as derived from 42 years of observed flow data from 1948-49 to 1989-90.

(2.5.2.2) The data available at the time of the NWDT award was very limited in terms of observed flow. A particular approach was adopted in the given circumstances and the flow arrived at was agreed upon. We have today a longer period of observed flow; the advantage of the development in the science of Hydrology during the interim period and the results of further studies made on the project in later years. The problem has to be looked at, keeping in mind the picture as it emerges in the present context.

(2.5.2.3) In Hydrology, both the length and accuracy of data are important. Since hydrologic phenomenon is not deterministic, but probabilistic, a longer period of data has a higher probability of representing all sequences of high and low flows that might occur in the river. Since this information is crucial for determining the reservoir storage, as much of the data as available for obtaining river flow series must be made use of subject to conditions of reasonable accuracy and dependability. Techniques are also available for checking the data for consistency and making corrections for possible errors within certain limits.

(2.5.2.4) The arguments in favour of 23 MAF are as follows:

- i) As of 1990, observed flow record is available for 42 years and this period is long enough for prediction. There is no need to resort to hindcasting, especially in view of the reservations expressed against the representative character of the rain gauge network and the accuracy of recording. The observed flow data which is more reliable than hindcast data yields a 75% dependable flow of 23 MAF.

* The M.P. Government have given some figures which are at variance with the figures of the Central Water Commission; according to them the combination of hindcast data and observed data for a period of 102 years (1891 to 1993) gives 75% dependable flow of 24.26 MAF whereas, the CWC had given a figure of 26.6 MAF for the period 1891 to 1990. This needs to be reconciled.

- ii) Charles Howard & Associate Ltd. who were commissioned by the 'Independent Review' (Morse Commission) to study the Hydrology, questioned the reliability of both the observed flow data and the derived hindcast data. They have suggested further studies for improvement, using the new data available (1992).
- iii) The 'Independent Review' which commissioned the study by the above consultants took note of their findings and concluded that the project "will not perform as planned."

As against these views, we have the following 'studies in support of 75% dependable flow of 27 MAF:

- i) HR Wallingford Ltd., an internationally known consultancy firm which was commissioned by the 'World Bank' to study various aspects of Sardar Sarovar Project has in its report under 'Hydrology and Water Resources' has emphasised the need for a long period of data and concluded unreservedly in favour of 27 MAF (1993) for the design after a detailed study, taking into account all the criticisms against:

"the accuracy of flow measurements and the integrity of flow records, both measured and hindcast series; the accuracy of dependable flows derived from the flow series and used by NWDT for allocating water shares among the four states and the ability to meet the planned water requirements of the Gujarat command area".

- ii) The World Bank which has been critically looking at almost every aspect of the SSP has, on the basis of its studies of the results of various analyses carried out by different agencies and by their own appraisal team, have concluded in its draft Project Completion Report (1994) that "the basic hydrologic data used for the design of the project are satisfactory."
- iii) The Narmada Valley Development Authority, Government, of Madhya Pradesh in their note on "Assessment of the Annual Flow Volumes at Sardar Sarovar Dam Site in the Narmada Basin" (vide letter No. W(NVDA)/301/II I(d)/74 dated 10.5.91) have made the following observations:

"..... it looks sensible that the flow data for 40 years or so, is long enough to be relied upon and there should not be any necessity of considering a longer flow series by hindcasting the series on the basis of rainfall-runoff relationship etc. However, it should be recognised that there are good, bad and average years of rainfall which appear to follow a cycle on a long terra basis. The estimation of dependable flows should, therefore, be on the basis of data for long enough period to cover the Hydro-meteorological Cycle and Catchment characteristics. Keeping this in view a study was carried out to find out the period of Hydro-meteorological Cycle of Narmada river at Garudeshwar"

* * * * *

"It would be seen from this study that dependable yield for a particular dependability for "any sequence of 79 years works out practically the same. The 75% dependable yield works out in the range of 27.64 to 27.892 MAF and 90% dependable yield works out from 19.903 to 20.489 MAF".

* * * * *

"The above study proves beyond doubt that the Hydro-meteorological cycle for Narmada basin at Garudeshwar is 79 years. Any computation of inflow done for a period other than this is bound to give erroneous results."

(2.5.2.5) It is with the evidences available as above, for and against the two view points, that a choice has to be made. A brief explanation of 'the term 75% dependable flow of 27 MAF is relevant even at the risk of stating what may be known. A 75% dependable flow of 27 MAF, means that an annual flow equal to or more than 27 MAF will be available for 75 years out of 100: For 74 out of 100 years, it would, be more by differing quantities. On the basis of a detailed analysis made by the Central Water Commission (1993), the availability of flow, based on the length of series and dependability, is as follows:

Data series	Annual yield at dependability of		
	50%	75%	90%
Observed data 1948-49 to 1989-90	30.3	23.0	16.9
Hindcast data 1891-92 to 1947-48 and observed data 1948-49 to 1989-90	33.0	26.6	19.8

Even assuming for the sake of argument that we neglect the entire hindcast data and take 42 years as long enough for prediction, and that the 75% dependable flow is 23 MAF; it would mean that in terms of observed flow, 27 MAF will have a dependability of 61%. If we design the system for 23 MAF, we would allow a substantial amount of water to spill and flow to the sea for over 60 years in a 100 year period. The excess could vary considerably; for instance the annual flow last year (1993-94) was 34.4 MAF and this year (1994-95) it is seen that it will exceed 52 MAF. It is to be decided whether, considering the drought-proneness of much of the command area of SSP in Gujarat and Rajasthan we should choose 23 MAF for the design of the system as against 27 MAF.

(2.5.2.6) Hydrology as a science, has been developed during the second half of this century: it is still empirical in nature. Hydrological phenomena unfortunately are not deterministic but stochastic and any analysis, needs long periods of data. It does not lend itself to laboratory experiments: one has to collect the available field data and develop methods for generation of data series. In a stochastic system, there could be no definite answer and any hydrological prediction, has to be in terms of probability, the accuracy of which again depends on the length and quality of data and the length of record is an important determinant. Consequently any technical analysis would only provide alternatives with corresponding probability and expected results.

(2.5.2.7) Giving due weightage to the reliability of observed flow and the length of observed flow available; recognising the reservations expressed about the representative character of the raingauge network prior to 1931, and taking into account the fact that:

- i. HR Wallingford, after a detailed study in 1993, considering all the apprehensions and objections raised, have upheld the adoption of 75% dependable flow as 27 MAF;
- ii. the Narmada Valley Development Authority, Govern-ment of Madhya Pradesh, in its study (1991) addressed to the question of minimum period of data required and flow available for various periods of dependability have concluded that their study proved beyond doubt that the Hydro-meteorological cycle for Narmada River at Garudeshwar is 79 years and the 75% dependable, flow works out in the range of 27.64 MAF to 27.892 MAF.
- iii. the World Bank which has been seeking a critical review of the project, after analysing all the studies and results available, has affirmed in its Project Completion Report (1994) its accepta-nce of the hydrological basis on which SSP has been planned;
- iv. the annual flows in Narmada exhibit a high 'coefficient of variation' and longer records would help predicting the dependable flow with greater reliability;
- v. even on the basis of the observed flow data 27 MAF will be available for over 60 out of 100 years;
- vi. the design especially of the entire canal system and the distribution system has been made and are under different stages of construction for 75% flow of 27 MAF; and
- vii. keeping in mind that cost difference in the project works will be marginal normally and more so when parts of the work have been carried out; and
- viii. realising that in the matter of investment in water, the benefit of doubt has to be in favour of fuller utilisation of the flow, the balance of advantage is in favour of adopting 27 MAF for the design and during the periods of shortage, water is to be distributed among states as already provided for in the NWDT award.

(2.5.3) Shri Ramaswamy R. Iyer's View

(2.5.3.1) The fact that the Wallingford Institute has rejected the criticisms of M/s. Charles Howard & Associates and the Morse Commission and have endorsed the quality of the data, and that the World Bank has accepted this, is not by itself decisive. Even if we agree that the quality of the observed data is sound and that hindcasting is a standard and accepted procedure, the question still remains whether hindcasting is necessary in this case. It needs to be noted that the actual observed flow data at every stage, whether for 15 years as at the time of the Khosla Committee, or 22 years as at the time of the Tribunal's proceedings, or 30 years as at the time of the World Bank's Staff Appraisal Report of 1985 or over 40 years as at present available, give a 75% dependable flow of only between 22 and 23 MAF; it is only the addition of hindcast data which transforms this into 27 MAF. The question is: should we do this?

(2.5.3.2) However legitimate the hindcasting procedure may be, what it produces is derived data (i.e., runoff data derived from rainfall data) which cannot have the same degree of reliability as actual data (observed flows). While it may indeed be necessary to stretch, the time-series of observed data by hindcast data when the former is meagre, 40 years' flow data cannot be considered meagre in terms of the CWC's guidelines and in terms of current practice.

(2.5.3.3) It has been argued that the last 40 years are only a low-flow part of a longer cycle. This is at best a hypothesis. The possibility that the hindcast numbers overstate the past flows cannot be entirely ruled out.

(2.5.3.4) The CWC's argument in their April 1993 paper that where the coefficient of variation in annual flows exceeds 0.20 a longer time-series is needed and that in the case of SSP, 130 years' data would be required, does not seem to arise from the existing guidelines on project preparation, or from current practice; and it was not put forward at any time earlier. (This also seems to be a case of over-argument: if indeed 130 years' data are needed, how can we proceed on the basis of 79 years' or 100 years' data? Should we not then wait for a further period of 30 years for such a series to become available? And if we do, are we sure that it will confirm 27 MAF rather than 23 MAF?)

(2.5.3.5) It is true that there is a conflict between the present view of the Government of M.P. (that primacy should be given to observed flows and that these indicate a 75% dependable flow of 23.5 MAF) and the 1991 view of the NVDA of the Govt., of M.P. (that there is a 79-year cycle in the river and that on this basis the 75% dependable flow would be in the region of 27.64 to 27.89 MAF). Even earlier there was a difference of views in M.P. From the 80's onwards there has been a view in that State that the 75% dependable flow is only 23 MAF; it appears that, that view has now become the official view with the change of Government. It seems unlikely that the NVDA which is only a part of the M.P. Government will today continue to support its 1991 view. This change by itself does not prove the earlier view right and the later view wrong. Moreover, while the NVDA in 1991 argued for a 79-year cycle, the CWC, in its 1993 paper, argues for 130 years' data; there seems to be an inconsistency here.

(2.5.3.6) It has been stated that the hindcasting procedure has been followed in a number of other projects. Unfortunately detailed information pertaining to those projects is not available regarding the length of the available time-series of observed data, the length of the

period for which hindcasting was undertaken, the 75% dependable flow on the basis of observed data, and the flow on the basis of the addition of hindcast data. In the absence of that information, it is difficult to say what bearing (if any) those cases have on the planning of the SSP. So far as we know, there are not many cases in which a 40 year time-series of observed flow data was available; and no case (other than SSP) in which it was decided to extend such a long time-series by hindcasting has been brought to our notice.

(2.5.3.7) If the SSP were a new project which was being planned today, it seems very unlikely that given the availability of 40 years' flow data, the project planners would consider it necessary to stretch that time-series by hindcasting.

(2.5.3.8) Even if hindcasting is considered necessary, and assuming that the rainfall-runoff coefficient has been correctly worked out with reference to the observed flows, the reliability of the hindcast data would depend on the quality of the rainfall data. The Khosla Committee had initially referred to the inadequacy and maldistribution of raingauges in the years prior to 1931 and had stated that the runoff series could be considered adequate if extended backward only upto 1931, but had subsequently decided to go back to 1915 in response to the M.P. Government's point that the period 1931 to 1962 did not cover some important drought cycles. If we limit the backward extension to 1931 and take the observed data forward to 1994-95, we still get a 75% dependable flow of only 24.006 MAF

(The flow series on which this statement is based was obtained from NCA and is reproduced as Appendix II(4)). (However, as argued earlier, hindcasting is not really called for in this case).

(2.5.3.9) It could be argued that even if the order of dependability which could be attached to a flow of 27 or 28 MAF is lower than 75%, project planning could still be based on this in order to ensure the fuller utilisation of the waters in the high-flow years'. While such an argument may have some force, the position is that the principle of 75% dependability has not so far been changed. Such a change would require a formal decision by the Central and State Governments. Besides, the question that we are considering here is: What is the quantum of flow available with a 75% dependability? That question is not answered by suggesting that we could accept a lower order of dependability.

(2.5.3.10) The above line of reasoning leads to the conclusion that the 75% dependable flow in this case is 23 MAF and not 27 MAF. (The adjustments for evaporation, regeneration and carryover by which 27 MAF became 28 MAF cannot be transferred without change to 23 MAF. No assumptions can be made in this regard, for the present).

(2.5.4) Dr.Vasant Gowariker's View

(2.5.4.1) I am in full agreement with the arguments advanced and the conclusions reached by Prof. V.C. Kulandaiswamy and endorse the adoption of a 75% dependable flow of 27 MAF for the design purpose.

(2.5.4.2) I would add the following remarks. My perception difference is essentially in terms of the extent of agony and the expression thereof which I would attempt to explain in simple terms without recourse to technical details (to be found, where required, elsewhere in this chapter). To that end, the following para is' a prelude to my subsequent argument.

(2.5.4.3) All national weaknesses notwithstanding, what has withstood the test of especially post-Independence times is India's technical strength built almost entirely on the products of our own educational system - which statement is not meant to belittle in any way any of the valid criticisms about our system. The fact remains, though, that whether it is harnessing atomic energy involving as it does the totality of steps starting from uranium mining, its metallurgy, isotope separation, concentration, conversion into the fuel rods to conceiving-designing-engineering-fabricating a totally indigenous atomic power plant or indigenously designing the state of the art communication satellites or building gigantic rockets or launch vehicles, or designing, engineering and building of major and minor dams - this nation's technical and technological might has now come to be recognised the world over as comparable with the best available anywhere on this globe. India needs no certificate from any country, no matter how mighty, that her scientific and technical personnel know their job. But this is precisely what seems to have happened unwittingly.

(2.5.4.4) The hydrological assessment of the Narmada Water flow endorsed by the Central Water Commission (CWC), which represents the design-engineering-technical wing of the Ministry of Water Resources (and the apex technical body for approving the design of all multi-purpose dams in this country) was thought fit to be referred, to one Charles Howard & Associates Ltd., a Canadian firm of Water Resources Engineers, simply because a doubt was raised on what was essentially a totally technical parameter perfectly within the ambit of technical experts or agency like the Central Water Commission (CWC).

(2.5.4.5) The Canadian firm, having been asked by a foreign "Independent Review" to study and advise, did give what would seem quite an innocuous view - the operative part of which was that "there are now enough new data, and sufficient time, to make improvement". What appears to have been lost sight of was that the matter entailed a technical issue, as I said perfectly within the terms of reference of a body like Central Water Commission (CWC) which has a well thought out technical methodology to enable it to proceed with the design of a dam at any point of time without having to wait for the whole "river of data and time" to flow before crossing! Obviously, this was not the first dam that the CWC was dealing with.

(2.5.4.6) In any case, the World Bank now being endowed with two views on the same subject had to take a final view on the matter. So they referred it for a third opinion to H.R. Wallingford of the U.K. That agency in its Report to the World Bank rejected the criticisms of the Canadian firm as well as the Morse Commission and concluded that "the lower virgin flows since 1949 do not constitute an emerging trend but rather a consequence of a" natural variability." In nutshell, the Wallingford Institute endorsed the CWC stand and accepted the CWC's hydrological basis for Narmada Project that "the 75% dependable flow of the river at Navagam may be taken as 27 MAF (and

allowing for various losses, regeneration and carry over storage, the net utilisable flow to be adopted for present planning may be taken as 28 MAF)". Having now received a third opinion, the World Bank, in its draft Project Completion Report of September 1994 concluded: "All reviews have concluded that the basic hydrological data used for the design of the project are satisfactory". The World Bank has thus accepted the validity of the CWC assumption.

(2.5.4.7) In other words, after a full circle the World Bank has come round to accepting something that the experts of this country had in any case resolved 20 years ago. To my mind, what was raised a controversy on, was as good as a "non-issue". Retrofitting my 3-line prelude at para (2.5.4.3) I hence conclude thus: (a) questioning the validity of 27 MAF as the river flow was quite unnecessary because it was as good as a "non-issue" in the first place, (b) but be that as it may, that the 27 MAF now being finally accepted as the correct figure by the World Bank, the controversy may now atleast be considered as resolved.

(2.5.5) Shri L.C. Jain's View

(2.5.5.1) I am in agreement with the reasoning and the conclusion of my colleague, Shri Ramaswamy R Iyer, that for planning purposes we opt for the estimate of 23 MAF. However, I would like to (i) add a bit more to this view; as well as (ii) expand a little on the implications for the planning of the project system relative to the two alternative estimates: 27 MAF and 23 MAF.

(2.5.5.2) It is necessary to remind ourselves about the limitations/qualifications which the authors of various hydrological estimation exercises have themselves stated so that we can better appreciate their conclusions arrived at based on sound technical advice*. These are summarised in the following statement:

Hydrology Estimates: Limitations		
I Expert Bodies	II Conclusions	III Limitations /Qualifications by the Authors themselves
1965 Report of the Narmada Water Resources Development Committee GOI, Ministry of Irrigation & Power – September 1, 1965	Since the data available by discharge observation is only for a limited period of 15 years or so, the Committee requested the CW&PC to work out a runoff series, based on the rainfall records available for the Narmada basin, after working out a rainfall runoff relationship for the observed data for the period of 1948 onwards. The CW&PC, in the Hydrological Directorate, have carried out these studies and established a rain-fall runoff relationship based on the runoff data from 1948 to 1962. It may be seen that there is no significant difference between rainfall values obtained with 1931 rain gauges and those obtained with rain gauges existing during the period 1948 to 1960.	As indicated by this study, the construction of runoff series could be considered adequate if extended backward only upto 1931. This provides a long enough series for yield analysis and has the merit of not appreciably vitiating the reliability of the series by inadequacy and maldistribution of rain gauges which existed in the years prior to 1931. (emphasis added)

* "Attempting a deterministic solution to the complicated issues involving stochastic elements, is not an easy task Judgement pronounced by the Tribunal based on sound technical advice in matters like hydrology and project planning has to be viewed, if at all, not in purely technical terms but in the context of analysis attempted at that time". (emphasis added)

(SSP: Availability and Plans for Utilisation of Narmada Water, Central Water Commission, 1993)

I Expert Bodies	II Conclusions	III Limitations /Qualifications by the Authors themselves
<p>1966 Summary Record of Discussions and Conclusions Reached at the Official Level Conference” - GOI,Ministry of Irrigation & Power, New Delhi - August.</p> <p>Chief Ministers of Madhya Pradesh, Maharashtra and Rajasthan and the Adviser to the Governor of Gujarat arrived at an agreement with the assistance of the Prime Minister, on a number of issues on 12th July 1974. Narmada Water Disputes Tribunal (NWDT), 1978.</p>	<p>Agreement, as recorded, has been reached on the first three items: I. Hydrology of the Narnada at and above Navagam. II. Utilisable supply for irrigation, as at Navagam and III. Utilisable supply for power, and installed capacity.</p> <p>I. Hydrology of the Narmada at and above Navaqam</p> <p>After an examination of the data in Annexure-I(a) it was agreed that for present planning, the 75% dependable flow of the river at Navagam may be taken as 27 MAF.</p> <p>II. Utilisable supply for irrigation, as at Navagam</p> <p>Taking the 75% dependable flow as 27 MAF and allowing for: i) evaporation losses for major and medium reservoirs, and minor tanks, say 4 MAF ii) regeneration or return flow, say +2 MAF iii) effect of carryover storage of 5 MAF say + 3 MAF</p> <p>It was agreed that the net utilised flow to be adopted for present planning may be taken as 28 MAF .</p> <p>That the quantity of water in Narmada available for 75% of the year be asses-sed at 28 million acre feet and that the Tribunal in determining the dis-putes referred to it do proceed on the basis of that assessment; This agreement came up for consideration of the Tribunal and in its judgement dated 8.10.1974 the Tribunal decided this issue as follows: “We accordingly accept the agreement of the party States on this issue (that is, issue No.7) quantum of waters in Narmada at Navagam dam site on the basis of 75% dependability should be assessed at 28 million acre feet.” The same figure has been at in the Official Level Conference in 1966 under:</p>	<p>It may be emphasised here that the studies/exercises carried; out by the States have been prepared at short notice and in considerable hurry; and also the comments and replies thereto.</p> <p>(emphasis added)</p> <p>The figures adopted for evaporation and carry over storage had not been derived from any detailed studies. The actual figures could be different but it is clear that these three factors have to be taken into account in securing the utilising quantum of 28 MAF in 75 percent years.</p> <p>(emphasis added)</p>

I Expert Bodies	II Conclusions	III Limitations /Qualifications by the Authors themselves
1993 H.R. Wallingford	<p>75 percent dependable flow... 27 MAF</p> <p>Evaporation losses from reservoirs... (-) 4 MAF</p> <p>Regeneration.. (+) 2 MAF</p> <p>From carry over..... (+) 3 MAF</p> <hr/> <p>28 MAF</p> <p>(emphasis added)</p> <p>After a detailed study in 1993, considering all the apprehensions and objections raised, have upheld the adoption of 75 percent dependable flow as 27 MAF;</p>	<p>Page -2: “This document does not purport to cover all the hydrology elements in the scheme design, nor is it in any sense a formal review of the hydrological decisions taken over many years”. “There is no pre-tence in this document at carrying out similarly detailed calculations that are properly the preserve of Indian agencies”.</p> <p>Page-13: “A conscious decision was taken not to spend disproportionate time pursuing all data back to its raw form...”</p>

(2.5.5.3) The Wallingford Report uses data of 1891-1948 series directly from NWDT (and adds that “there is no pretence in this document at carrying out similarly detailed calculations that are properly the preserve of Indian agencies”); NWDT accept the agreement of the party States on the quantum of waters (28 MAF) in Narmada (and adds that the figure has been arrived at in the Official Level conference in 1966); and the said Conference in 1966 presided over by the then Chairman of CWPC, went on record to say that “it may be emphasised here that the studies/exercises carried out by the States have been prepared at short notice and in considerable hurry”.

(2.5.5.4) The same virtuous circle goes for the estimate of evaporation losses, regeneration, effect of carry over storage. It was first calculated by the official Level Conference in 1966 but qualified as having been prepared “at short notice and in considerable hurry”. Twelve years later this estimate is adopted by NWDT which again qualifies that “these had not been derived from any detailed studies”. As in 1995, the matter rests there. I have not come across any detailed study of this aspect since.

(2.5.5.5) A word about hindcasting. Hindcasting is not untouchable. It is a question of when to touch it (that is, the necessity for it), and with what caution. In the instant case, it is pertinent to recall the caution sounded by the Narmada Water resources Development Committee (1965) headed by Shri A.N. Khosla with regard to the use of data for hindcasting in this case:

As indicated by this study, the construction of run off series could be considered adequate if extended backward only upto 1931.

This provides a long enough series for yield analysis and has the merit of not appreciably vitiating the reliability of the series by inadequacy and mal--distribution of rain gauges which existed in the years prior to 1931.

(2.5.5.6) The Khosla Committee also recorded that:

“Gujarat have agreed that the run-off categories should be from 1931 onwards only, considering the density and mal-distribution of rain gauges stations prior to 1931”

(2.5.5.7) However, being short of adequate period and on grounds urged by M.P. as noted earlier, the Khosla Committee leaned back upto 1915, i.e. included yield data for 1915 to 1930 in its calculations. But that did not alter the fact of “inadequacies and mal-distribution of rain gauges which existed in the years prior to 1931” and hence its mere use by the Khosla Committee could not improve the “merit” of the data for the period 1915 to 1930. One explanation for use of such data, inspite of recognised limitations is offered by CWC’s 1993 paper that judgement in matters like hydrology has to be viewed, if at all, not in purely technical terms but “in the context of analysis attempted at that time.”

(2.5.5.8) We need not question the conclusion drawn by CWC in its 1993 Paper that in the case of the Narmada Basin, the required data length is over 130 years for assessing utilisable flows; and its explanation that hind-casting had to be “resorted to improve the sample size to 79 years in past”. There can be no quarrel about the advice of a technical body about the length for which data is required. Indeed longer the series the better. But we cannot incorporate any data just to elongate the series. There has to be a discrimination between what, is admittedly more rigorous and reliable data.

(2.5.5.9) Similar comments apply to NVDA’s exercise which recommends a 79 year series. The length is fine. But the question is: which 79 years? From 1931 onwards or any 79 years?

(2.5.5.10) CWC can not improve the quality of the data prior to 1931 at this stage. It is difficult to understand how they have chosen to transgress the 1931 line - if greater reliability of data for project planning is their primary concern.

(2.5.5.11) CWC is our highest technical body in this field in the Government domain. Till today its guidelines for Project Planning for River Basin Development prescribe 40 years observed data as the basis (as in 1980), and 40-50 years (as in 1990). There is no amendment to these guidelines as of date. Nor were we given (though we asked for it) any project report for any project of this type, where more than 40 years data has been used as a basis for planning. CWC’s view that SSP requires a base of 130 years data for safer planning purposes makes this project a historical monument - never to be.

(2.5.5.12) There is a view that for the planning and design of the system of SSP, we should take into account:

- (i) the drought-proneness of much of the command areas of SSP in Gujarat and Rajasthan, the design, especially of the entire canal system and the distribution system has been made and are under different stages of construction for 75% flow of 27 MAF, there the cost difference in the project works will be marginal normally and more so when parts of the work have been carried out; and
- (ii) according recognise that in the matter of investment in water, the benefit of doubt has to be in favour of fuller utilisation of the flow.

Given these two the balance of advantage is in favour of adopting 27 MAF for the design of SSP.

It is a legitimate view that the maximum flow from Narmada should be tapped even if dependability were lower i.e. only about 60 years in 100 years, in order to extend the fight against drought; and since SSP is conceived as an assault on drought and is already under construction, it would be better from all angles to enhance SSP’s capacity through more effort and investment: however, this view is based on several assumptions, which need to be examined, even if at some length.

(2.5.5.13) In this perspective, we look a little closely, first as to how and to what extent SSP’s command is placed, by its design, to help Gujarat’s drive against drought; and what will be the implications of even marginal additions to investment on SSP, on Gujarat’s capacity to fight drought. Second, we look at the availability of essential associates since to become utilisable (especially through large engineering projects, such as SSP - their dams, storage capacities, canals etc.) water-flows require the compulsive company of other essential flows/factors - two of which are critical : finance and time, even if constraints of rehabilitation of the displaced and environment were to be excluded for a moment from consideration.

(2.5.5.14) Gujarat's need for water is paramount, unquestionable and urgent. For Gujarat, Narmada waters are waters of hope. Assault on drought is vital. There can be no two opinions about it. But in our general concern about the drought situation in Gujarat, it is often overlooked that the extent and degree of water deficiency varies sharply between different regions of that State. In the acutely drought afflicted areas of Gujarat it is not mere deficiency, it is deprivation. The question of putting more investment and effort on SSP to utilise the maximum available water resources for greater attack on drought has to be tested against the extent of access of the water-deprived areas of Gujarat to the Narmada Waters. This bears details including a repetition here of the points highlighted in FMG's April 1994 Report.

(2.5.5.15) To start with, it was the Irrigation Commission(1972) which put its stamp on the scheme to fetch Narmada Waters to Gujarat for fighting drought:

Wherever we went, and at whatever meetings were held, we were made keenly aware of the strong conviction of the people, that any significant improvement in the irrigation picture of Gujarat, particularly of the scarcity areas in Saurashtra, Kutch and North Gujarat, can only be brought about by irrigation from the Narmada.

Our visit to the scarcity areas brought home to us the urgency of providing irrigation there, and we are quite clear in our minds that, irrespective of what share of the Narmada waters might come to Gujarat, the first priority in the use of this water must be given to these areas where the rainfall is scanty and irregular, rather than to Broach and Baroda districts which have 762mm of assured rainfall.

The benefits from the use of this water in the areas of North Gujarat, Saurashtra and Kutch will be far greater than what would accrue in the two districts mentioned above. There will also be indirect benefits from the replenishment of the sub-soil water which will help the farmers to raise more than one crop each year. As a long-term prospect, we can envisage a beneficial change in the ecology of the area. (emphasis added)

(2.5.5.16) Indeed, Gujarat pressed its case before the Narmada Water Disputes Tribunal not only on the grounds of general drought-proneness of the state but in particular the imperative of alleviating the acute drought-affliction of Kutch, Saurashtra and North Gujarat as had been emphasised by the Irrigation Commission in 1972.

(2.5.5.17) In August 1978, the Tribunal gave its Award on the basis of 27 MAF (which is indeed the basis of present planning of the project and allocated 9 MAF to Gujarat's as its share in Narmada Waters. But what happened after Gujarat received its allotment is instructive.

(2.5.5.18) After the Award, the allocation of Narmada Waters by Gujarat Government amongst its different regions, followed a pattern different than the scheme of regional priorities recommended by the Irrigation Commission. Regions which were ranked as deserving the highest priority were given the lowest share and vice-a-versa. As mentioned in our earlier (April 1994) report, against 9.45 lac acre of land to be irrigated in Kutch, Government of Gujarat decided to allot water to irrigate only 0.94 lac acre of land in Kutch (i.e. 10 percent of the demand).

The Distribution Water from Sardar Sarovar Project (Kutch Development Forum as submitted to FMG)					
District	Area (Sq. Kms)	Average Rainfall (inches)	Present Irrigation (Lac Ha)	Irrigation S.S.P.	Percentage
Ahmedabad	8,707)		0.46	3.30	44.93
Gandhinagar	649)		—	0.10	
Mehsana	9,027)	25 to 35	0.63	1.50	
Banaskantha	12,702)		0.94	3.13	
Baroda	7,788)		1.24	3.40	
Broach	9,045)		1.28	0.58	
Panchmahal	8,866)	35 to 60	0.10	0.10	31.44
Kheda	7,188)		2.37	1.16	
Rajkot	11,203)		0.99	0.34	
Surendra Nagar	10,155)	20 to 30	0.23	3.04	21.45
Bhavnagar	11,155)		1.40	3.04	
Kutch	45,612)	5 to 10	0.24	0.37	2.11

(2.5.5.19) Gujarat Government's rationale for the above pattern of allocation of Narmada waters within the state is contained in "Sardar Sarovar Project: What it is and What it is not" (September, 1991). It merits attention:-

"The limits of the command area of the SSP have been determined on the basis of the alignment, of main canal, which has to run on falling contour to cover maximum area under gravity irrigation. Maximum area, which can be commanded from this canal by gravity, has thus been included for providing irrigation facilities.

Another limiting factor is water allocated for irrigation by Tribunal. The allocated water under normal application doses is not enough even to irrigate 1.3 M ha of area but in order to benefit the largest number of people, 1.8 M ha of annual irrigation is planned. If more waters are allocated to Gujarat by Tribunal, more areas could be covered even by lifting waters but this is unfortunately not the case.

It has never been claimed that all the areas under Saurashtra, Kutch and North Gujarat will be covered. We are aware that large areas are left out but we have tried to give maximum benefit to these regions by providing drinking water supply to all the areas which are in the command and also to areas outside the command in these 3 regions. This is a big gain for these areas.

As regards irrigation facilities to the areas left out of the Narmada Command; the optimum development of water resources in these areas, by all feasible schemes, including surface schemes, ground water and check dams and harvesting of water in the fields which would also recharge the ground water and counteract salinity are the only measures left." (emphasis added)

(2.5.5.20) FMG's comment on this issue, in its earlier report is worth recalling:

"It may, therefore, be reasonably expected that such measures would find adequate place and provisions in Gujarat's 8th Five Year Plan, 1992-97; and indeed the preliminary statement of Approach to Development in the State's 8th Plan document records high priority and promises massive support to such measures;

The diverse soil and water regions of Gujarat will be provided massive support through a high priority programme of watershed development, tank construction and of other traditional water development systems, completion of field channels and modernisation of lower level canal systems, improved ground water extraction and lift irrigation schemes”.

“However, the actual outlays proposed do not seem to reflect this. The Plan document says that the limited provision is on account of prevailing financial crisis and availability of very limited funds” (emphasis added)

(2.5.5.21) The same plan document also throws light on why the availability of funds is very limited for such (minor irrigation) schemes, though they are accorded “high priority” and promised “massive support”. It says the strategy of the Plan is to “provide maximum resources available for SSP”. In the State’s 8th Plan, (1992-97), Rs. 2,900 crore are committed to SSP; another Rs. 310 crore for continuing schemes of other major and medium irrigation projects. The provision for minor irrigation is Rs. 232 crore, of which Rs. 225 crore is for continuing schemes - and Rs. 7 crore for new schemes of minor irrigation in the entire 8th Plan period.

(2.5.5.22) So even in terms of the ‘only other measures left’, the financial outlays offer little relief. No one could do better than Shri C.C.Patel, former Chairman of Sardar Sarovar Narmada Nigam (SSNNL) Gujarat, to bring out the awesome implications of this continued neglect of these most drought-afflicted areas of Gujarat. In a letter dated 23 November, 1993 to FMG, Dr. Patel observed as follows:-

“Coming now to Gujarat, there are 5 district zones. The south Gujarat, Central Gujarat, North Gujarat, Saurashtra and Kutch.

Central and South Gujarat zones are reasonably well off so far as the water availability is concerned. Infact, the other infrastructural development in these zones have come up because of rapid agricultural and industrial development based on water intensive process.

However, the North Gujarat, Saurashtra and Kutch regions are drought prone and agriculture is a total gamble. The effect of drought is getting more and more severe because of depletion of ground water due to over draws*. No Government in Gujarat can enjoy political stability if water is not provided to these three regions.

Without Narmada waters there is no hope of development of these three drought prone regions. Large scale migrations of cattle running into millions have taken place during drought period especially in the last drought of 1985-87. The scenario undoubtedly is getting from bad to worse. It is unimaginable what would happen if millions of people are forced to migrate from Saurashtra, Kutch, and North Gujarat in search of food, shelter and water.”

(2.5.5.23) The SSP system has already been planned for receiving 27 MAF, but its command and consequently the design of the entire canal system has been so fixed as to deliver more water to zones, which Patel describes as “reasonably well off” or to areas where” agriculture is a gamble”. We could still go ahead and do that if after meeting SSP’s financial needs (which are estimated by SSNNL at Rs. 13,000 crore at 1990-91 prices, and we can easily see that sum is at 1994-95 prices; According to World at 1985 prices, while in 1988, the project was approved Rs. 6,400 crore, there were even reasonably small amount of investment resources left in the state plan. For the water starved areas outside the SSP command to enlarge our attack in drought, but that as we have seen is not the situation. Indeed, the overall resource position for capital investment through the budgetary support has undergone a sea change:

* In total contrast, to Patel’s moving plea is the planning/ investment thrust of the World Bank (PCR), which asks that even the limited plans which SSP has to provide irrigation to Kutch, Saurashtra, North Gujarat be cut out; which surely should find no support in SSP on those concerned with drought-affected areas:

“As the main canal and command area are still in their initial stages of construction, there is still time to readjust the irrigation and power supply components so that this project could become economically more profitable. This would be possible by cutting out some of the higher cost locations within the command area”

(In this case the higher cost locations recommended for cutting out are the tailenders - i.e. the small areas of Saurashtra and Kutch.)

It illustrates the agonising question in planning: benefits yes, but for whom?

“One of the most disturbing elements in the finances of State Governments is the increasing revenue deficit, the financing of which is often done by relatively high cost borrowed funds. This phenomenon, if unchecked for years, would eventually lead to unsustainable levels of debts and also progressively reduce the availability of resources for capital investments”

“The growing non-plan non-developmental expenditure, is estimated to pre-empt about 38.8 percent of the revenue receipts during 1994-95 as against 36.7 percent in 1993-94. The pre-emption of a relatively large portion of revenue receipts for meeting the growing non-plan non-developmental expenditure would imply that State Governments would have to undertake larger borrowing for meeting the investment requirements of (Plan) social and-economic infrastructure” . (‘Finances of State Governments 1994-95; Reserve Bank of India Bulletin, October 1994’)

Therefore, while ideally speaking, in the matter of investment in water, the benefit of doubt has to be in favour of fuller utilisation of the flow, investment decisions have to contend with many complexities. There are competing claims inter-sectoral (i.e. between irrigation and other sectors of the economy) and intra-sectoral (i.e. between mega, major, medium and minor irrigation projects/schemes) for the limited financial resources. Then there is the tyranny of cost/benefit: the actual utilisation of the irrigation potential of such large ventures remains particularly poor and returns even poorer:

“Experience of large number of Irrigation and Multipurpose Projects implemented so far shows that:

- i) In a number of cases the time taken for completion is considerably more than initially estimated and consequently benefits have been realised much later than expected.
- ii) The costs have been appreciably more than originally estimated and the returns have been smaller than anticipated.

While it is to be conceded that there has been a general escalation of prices of materials and wages, the extent of increase of project costs has exceeded the general price rise. Incomplete investigations, analysis and deficiency in the initial project planning are largely responsible for this state of affairs.

“The present position in the country in respect of planning for water resources and preparation of Project Reports for approval of the Government of India were highlighted in the report of the Expert Committee on rise of costs of Irrigation and Multipurpose Projects, 1973.” (Working Group Report, Guidelines for Preparation of Detailed Project Report of Irrigation and Multipurpose Projects GOI, Ministry of Irrigation, 1980.)

“The situation today is that since 1951, 246 big surface irrigation projects have been initiated. Only 66 out of these have been completed; 181 are still under construction. Perhaps, we can safely say that almost no benefit has come to the people from these, projects. For 16 years, we have poured out money. The people have got nothing back, no irrigation, no water, no increase in production, no help in their daily life.” (Address by Prime Minister Rajiv Gandhi to the Conference of State Irrigation Ministers, August 1986)

“The reality is that one of the world’s largest irrigation investments is performing unevenly and, on average, far below potential. Despite several decades of significant public investment in irrigation infrastructure, mainly large surface schemes, productivity is not breaking through to enable agricultural growth beyond the past threshold.

“Paradoxically, India’s major engineering achievements over the past half-century, resulting in massive expansion of surface irrigation, have contributed to the sector’s current problems. With the focus centered on construction the broader management needs of the sector were neglected and the cumulative costs of this neglect are now apparent”.

“Over the past decade, the situation appears to have worsened”. India cannot afford an over-expended and under performing sector. Sooner, rather than later, the burden will be financially unsustainable, and infrastructure will be physically unsustainable due to declining construction and maintenance standards. The situation is compounded in some area by environmental degradation. Above all agricultural growth will suffer”. (India: Irrigation Sector Review, World Bank, 27th June, 1991, Vol. I, Mai Report).

“Ultimately, in a developing country particularly, the environment and development can’t be mutually exclusive. We have to synchronise and harmonise the two. We are not going in for large dams any more.

We want run of the river projects and to have smaller dams, if they are necessary at all, which will not cause any impediment whatsoever to the environmental needs. We can hardly have a massive hydro project, except on the Brahmaputra, where we would be able to tame the river and make safe from flooding a very substantial area which gets flooded every year. But that all takes money and it is true, the Brahmaputra project has disappeared.” (N.K.P. Salve, Union Minister of Energy, International Water Power & Dam Construction, January 1995)

Further, such benefits as they yield are spatially restricted (location specific) while water needs of our villages and people therein, are almost universal.

And if all eggs are put in one basket as here in SSP, the water starved regions like Kutch etc are certain to be denied even the minimum resources, accentuating the equity crisis. And, that would be poor planning.

(2.5.5.25) To conclude, from the view point of fighting drought in Gujarat, it is advisable not to put all the eggs in the SSP basket - whose command design has excluded the acutely affected areas. We must not dry up the scope (finances) for meeting the minimum needs in the minimum time of those severely drought afflicted areas of Gujarat which are outside the SSP command. Even for SSP, adoption of 23 MAF for planning will ease the pressure of finance and likewise on inter-linked projects in MP etc.

(2.5.5.26) We are not here to look askance at a higher hydrological flow should nature bestow that upon us in its munificence. To do so would be an act of ungratefulness. Nor are we here to belittle the most audacious engineering solutions. We are here to choose how much of the river's bounty we can prudently entrap through engineering interventions which can not be autonomous of other factors: finance, time, and the pressing needs of other, drought afflicted areas; and our capacity to bear the uprooting of people which is here and now and certain while, as past experience teaches us, what these majestic projects promise is neither so certain nor so near.

2.6 Bearing on Project

(2.6.1) In our earlier Report we had recommended that “the Government should quickly have this issue examined and resolved once for all.” However, now the issue has been referred back to us by the Supreme Court and we have examined it and given our views. As is evident from the preceding paragraphs, our views on this question are not unanimous. However, for our present purpose we need merely note that the implication of assuming that the 75% dependable flow is only 23 MAF, is that 27 MAF of runoff may not be available with 75% dependability; but it may be available with a lower order of dependability, say 61%. In other words, the quantity of flow (on this assumption) may fall short in 39 years rather than 25 years in a 100 year period. Such a situation could well have emerged even after the project had been completed and had gone into operation. The Tribunal has already; provided a formula for distribution when the flow falls short:

“In the event of the available utilisable waters for allocation in any water year, from 1st July to 30th June of the next calendar year falling short of 28 MAF, the shortage should be shared between the various States in the ratio of 73 for Madhya Pradesh, 36 for Gujarat, 1 for Maharashtra and 2 for Rajasthan.” (The NWDT's Report, Vol.1, Chapter IX, paragraph 9.10.8).

III. HEIGHT OF THE DAM

3.1 The Point of Reference

In our earlier Report we had referred to a proposal (received at a late stage) from the Madhya Pradesh Government that the height of the dam should be reduced with a view to reducing the magnitude of submergence and displacement, and had refrained from going into it as the height of the dam was among the aspects of the project which we were required to take as fixed, in accordance with our Terms of Reference as clarified by the Ministry of Water Resources. Now this is one of the issues referred to us by the Supreme Court. We have to consider the rationale and implications of the proposal and express an opinion.

3.2 The Background

(3.2.1) At the outset it may be useful to recall certain basic features of the project as at present under construction in terms of the Tribunal's Award:

Maximum Water Level	460' (140.2 m)	
Full Reservoir Level	455' (138.7 m)	
Spillway Crest Level	400' (121.91 m)	
Dead Storage Level (for irrigation)*	307' (93.6 m)	
Minimum Draw Down Level (for power generation)	363' (110.6 m)	
Dead Storage	2.97 MAF	
Space for Silt in Live Storage	0.30)	
Live Storage for Regulation (upto level 453')	1.39)	4.70 MAF
Carry over Storage	2.81)	
Storage between 453' and 455'	0.20)	
Gross Storage	7.67 MAF	

(3.2.2) Before entering into a discussion of the issues involved, we must take note of the manner in which the Tribunal determined the FRL of 455'. As mentioned earlier, the Tribunal had accepted the agreement among the party States that "the quantum of waters in Narmada at Navagam dam site on the basis of 75% dependability should be assessed at 28 million acre feet" (paragraph 4.1.16 of the Report, Vol. I). The Tribunal had also noted that this was based on a 75% dependable flow of 27 MAF, with adjustments for evaporation losses from reservoirs (-4 MAF), re-generation (+2 MAF) and carry-over (+3 MAF) as agreed upon by the party States, (paragraphs 4.1.10 and 4.1.11). The Tribunal observed that the figures adopted for evaporation, re-generation and carry-over had not been derived from any detailed studies, but agreed that these factors had to be taken into account (Report, Vol. II, paragraph 11.2.1). Having accepted the utilisable flow of 28 MAF, the Tribunal proceeded to consider how this could be ensured and came to the conclusion that allowing for evaporation losses and re-generation from water use, the total quantity of water which needed to be made available for the purpose would be 29.29 MAF; and further that this could be secured only by providing the necessary carry-over storage space in various reservoirs*. The Tribunal came to the conclusion that a total quantum of carry-over storage to the extent of 8.29 MAF had to be provided in the whole of the river system and that this should be provided in the reservoirs of Madhya Pradesh and in Sardar Sarovar more or less pro-rata to the water use i.e., in the ratio of 18.5 (including Maharashtra) to 9.5 (Gujarat + Rajasthan). On this basis they decided that carry-over capacity of 5.48 MAF in the reservoirs of M.P. and 2.81 MAF in Sardar Sarovar would be required (Report, Vol. II, paragraph 11.5.1).

(3.2.3) For the purpose of ensuring that the canal waters would reach Rajasthan, the Tribunal had fixed the full supply level (FSL) of the canal at +300' which, with a provision of 2' for working head at the head regulator and losses of 5' in the approach tunnel and channels, gave a dead storage level (for the purpose of irrigation alone) of 307'. At this level, the dead storage capacity, would be 1.68 MAF (Report, Vol. II, paragraphs 10.14.1 and 11.11.1). This, together with the provision of space for silt deposition in live storage (0.30 MAF), a live storage capacity of 1.39 MAF for irrigation and a carry-over storage provision of 2.81 MAF (as mentioned above) gave a gross capacity of 6.18 MAF. This corresponds to an FRL of 436' (paragraph 11.12.1).

* But see paragraphs 3.3.3 and 3.5 below.

* One Member of this Group, Ramaswamy R. Iyer, has some questions to raise on the manner in which the Tribunal has proceeded in this regard. His note is attached as appendix III (1).

(3.2.4) However, the Tribunal noted that the Jalsindhi hydroelectric project jointly sponsored by Maharashtra and M.P. would become unfeasible with the construction of Sardar Sarovar with an FRL of 436'. In order to make good the loss of this potential, the Tribunal decided that the FRL should be raised in order to increase the power-generating head and the quantum of power generated in the SSP, as also to ensure year-round operation. For this purpose they concluded that an FRL of 453' would be needed. Having arrived at an FRL of 453', the Tribunal decided to add a further 2' to increase the carry-over capacity, and fixed the FRL of SSP finally at 455'(paragraphs 11.14.1 - 11.15.3).

(3.2.5) This is the background to the determination of the height of the dam by the Tribunal and from this follow the various features mentioned in paragraph 3.2.1 above.

3.3 Submissions to the Group

(3.3.1) We shall give here a broad outline of the submissions made to us on the subject, leaving details to be dealt with later in our discussion of the issues.

(3.3.2) The basic proposition in the submission of the Madhya Pradesh Government (deferring for later consideration certain secondary propositions) is that the height of-the dam should be reduced from FRL 455' to FRL 436' by the elimination of the 19' added by the Tribunal essentially for increasing the power benefits. Their argument is that this addition greatly increases the magnitude of submergence and displacement. They point out that the Tribunal had proceeded on the basis of a certain number of submergence-affected families (7366 out of which 6147 would have been in M.P.) whereas the actual numbers (as we now know) are very much larger* (reportedly 33014 families in M.P. alone). The M.P. Government feel that the whole displacement/ rehabilitation problem has become very large, complex and difficult, and that it is necessary to see whether the size of this problem can be reduced and made more manageable. One way of doing this would be to reduce the height of the dam (FRL) to 436'. This, they argue, will affect only the power generation and not the water allocation or the irrigation benefits, whereas there will be a significant reduction in the magnitude of submergence and displacement. M.P. whose share is 57% of the power benefits is willing to accept the reduction in that benefit which will result from the proposed height reduction.

(3.3.3) The Gujarat Government's answer is that the proposed reduction of height would affect not only the power benefits but also the irrigation benefits, for the reason that the MDDL for the purpose of power generation has been fixed at 363' as against the dead storage level of 307' planned for irrigation, with the result that the storage for irrigation is available only from 363' upwards (and not from 307') to the FRL. A reduction in the FRL would, therefore, affect the water available for irrigation. The Gujarat Government also argue that the reduction in the power benefits would be larger than estimated by the M.P. Government and that this would be a substantial national loss; and that on the other hand the reduction in displacement would be only marginal and not of the magnitude mentioned by the M.P. Government. On these grounds they argue that the dam height should not be reduced. They also point out that it will be possible to reduce the extent of submergence and displacement by providing afflux bunds which will mitigate the backwater effects even without any reduction in the height of the dam.

(3.3.4) The Maharashtra Government point out that as a result of the proposed height reduction, there will be a substantial reduction in the energy generation leading to a significant loss of power benefit for Maharashtra also, whereas the reduction in submergence area and affected population in Maharashtra is negligible. They, therefore, do not agree to the proposal to reduce the FRL from 455' to 436'.

(3.3.5) The Government of Rajasthan is of the view that the NWDT had made a critical study of all the issues and had fully addressed and negated the alternative of fixing the height at 436', and that the height of the dam is subject to review only in/after December 2024.

(3.3.6) The Government of India point out that any reduction in the height of the dam would result in loss of power generation; that the major reason given by the M.P. Government for the proposed reduction, namely, the saving in submergence and displacement, has to be considered in the light of the fact that considerable expenditure

* As we point out in the next chapter, there are a number of reasons for this increase in numbers; the NWDT's estimate and current estimates are not strictly comparable.

has already been incurred on the project and that “it is essential to derive interim benefits from the project”; and further that “to ensure this, it is necessary that the dam is constructed at least upto EL 110.64 M (363’) without any delay”. They add that “without violating the provisions in the clauses of the NWDT Award and without ignoring the issues raised against the SSP, the Sardar Sarovar Dam could be constructed upto the crest level of EL 122 m (400 ft.) as per existing designs. Raising the reservoir level further through installation of gates above the crest could be carried out in phases, to accommodate slippages, if any, in R&R. It has been observed that at EL 122 M (400 ft.), when a 1 in 100 year flood occurs, the afflux at the dam will be at EL 136 M (446 ft.). Hence in the later phases of construction, the afflux levels at the dam during the monsoon season could be maintained in such a way that the level would not go beyond EL 136 M (446 ft.) until R&R is completed in full upto this level..... it would be possible to limit the afflux levels for various phases of construction above crest level to EL 136 M (446 ft.) by judicious operation of the gates. With the constructed level at EL 122 M (400 ft.) and with Afflux Bunds constructed at EL 138.68 M (455 ft.), it would facilitate implementation of R&R plan to a great extent. Afflux Bunds are similar to flood embankments.” (A Feasibility Report on “Schemes for Protection of Villages in M.P. affected by Backwaters of Sardar Sarovar Reservoir” has been prepared by the NCA, and field surveys are said to be in progress).

(3.3.7) The NBA points out that suggestions for a reduction of the height of the dam are not new and that numerous proposals in this regard have been made by various official and non-official agencies and individuals from time to time since 1980; that the displacement which the NWDT had estimated at around 7,000 families has already touched 41000 families, even without counting categories other than those directly affected by submergence; that R&R has run into serious difficulties; that the hydrological aspect of the project has become highly controversial; that the financing of the project is becoming problematic; that there are severe environmental impacts; that there is uncertainty about the benefits; and that on these and other grounds a re-examination of the project is called for. They broadly support the M.P. Government’s proposal for a reduction in the height of the dam, but go far beyond it. They feel that, a review should not confine itself merely to the question of reduction of height but should consider a radical restructuring of the project taking into account all the adverse factors and uncertainties which have been urged and also keeping in view the changing perspectives of water resources development.

3.4 The Points at Issue

We formulate the points at issue as follows:

- i) Is the M.P. Government’s contention that the proposed height reduction (from FRL 455’ to 436’) will not affect the water allocation to Gujarat and Rajasthan or the planned irrigation benefits of SSP, valid?
- ii) What will be the impact of the proposed height-reduction on the planned power benefits?
- iii) What will be the magnitude of reduction of submergence and displacement as a consequence of the height-reduction?
- iv) In the light of the answers to Questions (i), (ii) and (iii) above, is there a case for reducing the height of the dam as proposed by the M.P. Government?
- v) Are there grounds for considering the other propositions (FRL of 400’, 384’ etc) put forward by the M.P. Government, and the more radical restructuring of the project proposed by NBA?
- vi) What is the Group’s view on the Government of India’s suggestion of proceeding in a phased manner beyond 400’?

3.5 Impact on Irrigation

(3.5.1) An important point is whether in fact the irrigation benefits will be affected by the reduction in the height of the dam as argued by the Gujarat Government. It is true that the MDDL for the purpose of power generation has been fixed at 363’ and that consequently this has become the MDDL for irrigation also, though the dead storage for irrigation alone would have been 307’. However, an irrigation bypass tunnel had in fact been envisaged and

figures in the enumeration of the salient features of the project in various documents. It is understood that the M.P. Government was objecting to this feature because of the apprehension that this might reduce the availability of water for power generation. Now that the M.P. Government is proposing a reduction in the height of the dam and is willing to accept the consequent reduction in the power benefit, that objection no longer subsists. In fact they have stated as follows in their submission: "As suggested at one time by the Government of India, an irrigation bypass tunnel could be provided." It is, therefore, possible to operate with a dead storage level of 307' for the purpose of irrigation through the provision of an irrigation bypass tunnel. To the limited question of whether the proposed, reduction of the FRL from 455' to 436' will by itself affect the inter-State water allocation or the irrigation benefits, the answer is: "No, if an irrigation bypass tunnel is provided, assuming that carryover storage capacities and regulated flows from M.P. as stipulated, by the Tribunal, remain unchanged." That assumption however, may not be valid as will be seen from the following paragraphs.

3.6 Points regarding Flows and Storages

(3.6.1) The Gujarat Government have pointed out that in accordance with the Tribunal's direction, M.P. was to have increased the carryover capacity in its reservoirs to an aggregate of 5.48 MAF or adjusted the pattern of its water use. Referring to the fact that the Narmada Sagar Project which in accordance with the Tribunal's award should have come up along with or earlier than SSP is lagging behind, the Gujarat Government have drawn attention to the fact that the Tribunal had observed (Report, Vol.II, paragraph 15.6.5) that in the absence of regulated releases from the Narmada Sagar Dam, the FRL of the Sardar Sarovar dam would have to be 490'. On the other hand, the M.P. Government argue that in the light of the longer series of observed data now available, the 75% dependable flow in the river is 23.5 MAF and not 28 MAF; and further that the water availability in the reach between Mortakka (near NSP) and Garudeshwar (near SSP) on the basis of the runoff series for the period 1931-1992 is 2.5 MAF and not 5.21 MAF as assumed by the Tribunal, thus invalidating the Tribunal's argument that a high carry-over storage is needed in SSP "to comb the flood flows below Narmada Sagar".

(3.6.2) The M.P. Government have also argued that the carry-over storage provision in the SSP made by the Tribunal (2.81 MAF which is 67% of the total live storage) is excessive; that in other projects (Bargi, Bansagar, Narmada Sagar), carry-over storage is provided only to the extent, of, 20% of the live storage; and that in the SSP the provision could be reduced from 2.81 MAF to 1.27 MAF or even 0.66 MAF. Based on different assumptions regarding the 75% dependable flow and the quantum of carry-over storage, they postulate different FRLs (436', 422', 404', 400' and 384'). As the Gujarat Government have pointed out, arguments on these lines (questioning the provision of the carry-over storage capacity of 2.81 MAF in SSP, proposing 1.27 MAF or 0.66 MAF instead, and so on) had been put forward by the M.P. Government before the Tribunal and the Tribunal in its Further Report had specifically considered all these points and rejected them. (In the event of the virgin flows being lower than 27 MAF, the storage capacities may have to be recalculated, but the principle that the Tribunal has laid down that the capacities should be provided in the two States in the proportion of the respective water allocations would remain).

(3.6.3) In their submission, the M.P. Government have stated that even if the carry-over storage in SSP is reduced from 2.81 MAF to 1.27 MAF or to 0.66 MAF, "the irrigation requirement of Gujarat and Rajasthan can be fully met by the carry-over storage in the upper catchments of the valley in M.P. and by suitable regulation of water releases." The letter from the Chief Minister of Madhya Pradesh to the Prime Minister proposing a reduction in the FRL of the dam from 455' to 436' also makes the point that the water allocation to Gujarat and Rajasthan would be maintained. Apart from the fact that similar assurances had been rejected by the Tribunal, we are not clear how precisely this assurance is proposed to be implemented particularly in the context of the delay in the Narmada Sagar Project.

(3.6.4) In this context we must also take note of certain observations of the NWDT and of the CWC. The NWDT in its Further Report (paragraph 4.6.2) says:

".... It is necessary to emphasise that the quantum of 28 MAF of 75% dependability is relevant only for allocation of water and not for fixation of the height of the dam".

The CWC in its 1993 paper (paragraph 8.3) observes:

"..... Sardar Sarovar Dam storage was decided independent of the value tag of 75% dependable flow. Storage need depends on the expected monthly inflow pattern, monthly demand pattern and the criteria stipulated for reasonable success in meeting the planned demands."

These observations of the Tribunal and the CWC need to be properly understood. They mean that the 75% dependable flow is not the only factor in determining storage capacities or the height of the dam, and not that it is not a relevant factor. The CWC itself refers to “the monthly inflow pattern”, and the Tribunal begins its chapter on the determination of the height of the dam (Report, Vol. II, Chapter XI) with several paragraphs on the 75% dependable flow.

(3.6.5) Our own understanding of this rather complex matter is as follows: Assuming that the virgin flows remain the same, there may be a case for compensating for an inadequacy of carryover storage capacity upstream by increasing the capacity in the terminal project. However, that argument may not have the same force if the virgin flows themselves are lower than had been assumed. Up to a point, in the event of lower flows, the height of the dam could be retained or even raised with a view to impounding a greater proportion of the annual flow; but this argument cannot be carried too far, and in any case it would imply a departure from the principle of 75% dependability which still remains in force.

(3.6.6) These arguments regarding flows and storages do not by themselves enable us to take a view on the proposal to reduce the height of the dam; that question can be answered only in the light of all the relevant circumstances.

3.7 Reduction of Power Benefits

(3.7.1) What will be the quantum of reduction of power benefits if the FRL is reduced to 436'? This is a difficult question as there are divergent answers. The Tribunal had calculated that with the FRL at 436' instead of 455', the loss of power generation would be 230-350 MKwh per year and that power generation would be seasonal. However, the power component of SSP as now being implemented is significantly different from what the NWDT had envisaged. The NWDT had provided for 5 conventional units of 150 MW each aggregating to 750 MW in the RBPH and 5 conventional units of 75 MW each amounting to 375 MW in the CHPH, the total capacity being 1125 MW. Now, however, the installed capacities of RBPH and CHPH are 1200 MW and 250 MW respectively; the RBPH is an underground powerhouse; and reversible turbines are being installed in the RBPH to function in the pumped-storage mode. Thus, the factors with reference to which the Tribunal had made its calculations have changed and the calculations have to be made afresh.

(3.7.2) The M.P. Government makes the point that there has been a delay in the project construction as also in the receipt of the T.G. sets for the RBPH and that work on the canal is going ahead, with the result that the particular configuration and phasing of power generation and irrigation development that the Tribunal had envisaged is not materialising. In view of this, the M.P. Government argues that there will be an over-all reduction in the quantum of power generation to the extent of 23%. They also criticise the manner in which the Tribunal estimated the loss of power benefits corresponding to an FRL of 436' as being un-representative. They feel that the reduction in the FRL to 436' would lead only to a marginal loss of power benefits: they estimate this at around 10%.

(3.7.3) The Gujarat Government disagrees with this and estimates the loss of the power benefit at 30%*. They refer to the Tribunal's estimate of a loss of 230-350 MKwh per year and take the latter figure, to which they add a loss of 279 MKwh in the RBPH and a further loss of peaking power of 310 MKwh as a result of the reversible operation not being possible for 5 months in a year and arrive at a total annual loss of 939 MKwh.

(3.7.4) In their submission, the Government of India have not attempted their own assessment of the reduction of the power benefit but have merely referred to the Tribunal's estimate.

(3.7.5) The difference between the two State Governments' estimates of loss of power benefits resulting from a reduction in the FRL to 436' is a technical question on which we are not in a position to give, an opinion. This will need to be referred to experts for an authoritative determination of the correct position. However, while the actual numbers have to be determined by experts, there can be little doubt that there will be a significant loss of power generation if the FRL is reduced from 455' to 436'. It is possible that the benefit of peaking facility may also be affected. While M.P. may be willing to accept a reduction in the power benefit, Gujarat and Maharashtra will also

* GOG mentions an annual power generation of 5000 MKwh. 30% of this would be 1500 MKwh. However, GOG later puts the annual loss of power generation at 939 MKwh.

be affected as they are to get their shares of SSP power (16% and 27% respectively). This is certainly a matter for concern. The question is whether this has to be accepted as inevitable in the interest of bringing about a reduction in the incidence of displacement. Accordingly, we now turn to the quantum of saving in submergence and displacement in the event of a reduction of the height of the dam from FRL 455' to FRL 436'.

3.8 Reduction in Displacement

(3.8.1) The M.P. Government gives the following figures in this regard:

S. No.	Particulars	FRL 455 Feet	FRL 436 Feet	Saving
1.	Gross submergence in the Three states (Acres).	91,500	66,750	24,750
	(Hect.)	37,045	27,004	10,041
2.	Culturable area sub- merged in Madhya Pradesh (Hect.)	6,598	3,350	3,248
3.	Forest area submerged in Madhya Pradesh (Hect.)	2,732	2,150	582
4.	Villages affected in Madhya Pradeh	193	126	67
5.	Population affected in Madhya Pradesh (Nos)	1,13,983	75,522	38,461

The Gujarat Government state that the reduction in the gross submergence would be 10,231 ha which is not very different from GOMP's figure, but they say that out of this, private agricultural land would be only 2755 ha* and that the rest of it is either waste land or forest land. As regards reduction in the number of project affected people, GOG observe as follows:

“The proposed reduction would bring down the number from 33,014 to 26,400 if the proposal of MP Govt. is accepted giving the impression that 6,918 families are saved from submergence. Of this number, however, a substantial portion - 5764 in number - are such as whose huts are merely affected and are to be resettled at a higher elevation. In other words, the real benefit of the proposed height reduction is only in respect of 1,154 families who are affected both in terms of huts and agricultural lands.”

“One of the arguments advanced for reduction in height is that a very large number of Tribals would be saved from displacement by reducing the height from 455 ft. to 436 ft. This is not borne out by facts. Only about 29% of PAPs in M.P. are tribals and the PAPs saved from submergence will be only from M.P.”

(3.8.2) It will be seen that while there is not much difference between GOG's and GOMP's assessments of the reduction in gross submergence, there are some differences in regard to the extent of agricultural land as well as in regard to the number of people affected. These are only rough and preliminary estimates. The precise number will have to be determined after detailed surveys. For the present, having regard to the GOG's estimate of 6918 families

* On p.50 they refer to the Action Plan on R&R prepared by the Government of M.P. and draw the conclusion that “the reduction in submergence of private agricultural land would not exceed 1254 ha.”

(which may translate into around 21,000 people if we make the assumption of 3 members in a family, based on the numbers of project-affected families and the population affected given in the next chapter on Resettlement and Rehabilitation) and the GOMP's estimate of over 38,000 people, we can only make the assumption that the actual numbers may be somewhere in between.

(3.8.3) In so far as Maharashtra is concerned, it has been stated that the reduction in the submergence area and R&R problems would be only marginal. GOG gives no figures of this kind for Gujarat. In any case the total numbers affected in Gujarat and Maharashtra are relatively small.

3.9 GOI's Suggestion

(3.9.1) We must also consider the Government of India's suggestion referred to in paragraph 3.3.6 above. If we have understood them correctly, what they have in mind is that (having regard to the stage of construction already reached and the expenditures already incurred), it would make sense to raise the dam to the minimum height (363') needed for the commencement of benefits and further upto the crest level of 400', while at the same time ensuring compliance, with the condition of rehabilitation six months in advance of submergence; and that beyond that level, the gates can be installed in stages (three tiers) corresponding to different reservoir levels, so that at each stage the advance completion of R&R before submergence can be ensured.

(3.9.2) While we find much merit in this idea, there is one point on which we are not entirely clear. The Government of India have referred to "phased construction above EL 122 M (400')", at which level "when a 1 in 100 year flood occurs, the afflux at the dam will be at EL 136 M (446)"; and also to the possibility of limiting "the afflux levels for various phases of construction above crest level to EL 136 M (446)' by judicious operation of the gates" (underlining ours). This can be interpreted to imply that the condition of advance rehabilitation before submergence will be ensured beyond 400' through the operation of the gates (i.e. controlling the water level by opening the gates), and not by making the progress of construction conditional on the completion of R&R. If this interpretation is correct, this would not be phased construction but phased submergence; through tiered construction. This could have the effect delinking construction from R&R. We presume this is not the Government of India's intention.

(3.9.3) Reference has also to be made to the scheme for protecting a large number of villages through the construction of afflux bunds which are said to be akin the flood embankments. Flood embankments are familiar enough but the idea of building such embankments or afflux bunds on the banks of reservoirs in large storage projects is not [...] this is done in SSP, it will be the first large project to adopt this feature. We note that a proposal in this regard is under the consideration of the Narmada Control Authority. We hope that this idea which seems promising will be found feasible.

3.10 NBA's Position

(3.10.3) As noted in paragraph 3.3.7 above, NBA has called for a radical restructuring of the project. The specific issue referred to us by the Supreme Court is "height of the dam" and we have to confine ourselves in this chapter to that issue. In so far as the reduction in the height of the dam is concerned, we note that the NBA supports the M.P. Government's proposal.

3.11 Conclusions

(3.11.1) Views of Prof. V.C. Kulandaiswamy, L.C. Jain and Ramaswamy R. Iyer

(3.11.1.1) We must now draw conclusions from the foregoing analysis, but a preliminary point needs to be made. The SSP is now in an advanced stage of construction, with the central portion of the dam already raised to 80 m; the canal constructed upto a length of 140 Kms; and most of the equipment for various components of the project ordered and some of it already wholly or partly manufactured. An expenditure of over Rs.3800 crores is said to have been already incurred on the project; significant social costs have also been incurred in terms of displacement and rehabilitation. The benefits for which these costs have been and are being incurred have not materialised yet.

In that, situation, anyone with a concern for keeping project costs under check and for ensuring the early commencement of benefits would generally like to accelerate rather than retard the completion of the project as planned. If any suggestion for major changes in the features of the project at this juncture is to be entertained at all, there will have to be the most compelling reasons for doing so.

(3.11.1.2) Are there such compelling reasons? The answer to that question would depend on the view we take of the displacement/rehabilitation problem. Two views are possible.

- (i) If we are of the view that the problem is manageable and that the deficiencies which have come to light can be rectified through appropriate remedial measures, then there is really no case for a reduction in the height of the dam or for any other major change in the basic features of the project. In this view, the project authorities should take all necessary steps on the R&R front, and press ahead with the implementation of the project.
- (ii) On the other hand, if we are persuaded that R&R is beset with serious and persistent problems and is not proceeding smoothly and is not likely to do so, then we might be led to the conclusion that there should be an examination of the possibilities of reducing submergence and displacement to a more manageable size. The question of the magnitude of the R&R problem and the manner in which it is being managed is discussed in the next chapter.

(3.11.1.3) Meanwhile we have to take a view regarding the controversy between the Governments of Gujarat and M.P. In the light of the circumstances referred to in paragraph 3.11.1 above, we appreciate the Gujarat Government's desire to proceed with the project. At the same time we cannot ignore the M.P. Government's apprehensions on the R&R front and their desire to reduce the magnitude of that task. It is in this context that we find that the Government of India's idea of phased construction outlined earlier offers a practical solution; it does not prevent the FRL from being raised to 455' in due course if the necessary conditions are satisfied; and it enables the, Government of M.P. to take stock of the position at 436' and call a halt if necessary. We would, however, reiterate the presumption expressed in paragraph 3.9.2 above namely that no delinking of construction from R&R is intended and that by "phased construction" the Government of India do not mean merely tiered construction which facilitates controlled submergence in phases. We recommend phased construction in a literal sense, that is to say, that at each phase it must be ensured that the condition of advance completion of R&R has been fulfilled before proceeding to the next phase (i.e. the installation of the next tier of the gates). This would apply even to the installation of the first tier. "Judicious operation of the gates" (while necessary) cannot a substitute for the aforesaid condition.

(3.11.1.4) 'In this proposition, the possibility of further construction when the FRL of 436' is reached or a stoppage at that stage is left open. This assumes that the irrigation bypass tunnel will be already in place so as to keep the irrigation benefits intact. It further assumes that the shares of Gujarat and Rajasthan in Narmada waters as allocated by the Tribunal will be maintained by M.P. by appropriate releases from upstream storages as promised.

(3.11.1.5) As regards afflux bunds, if it is found feasible to afford substantial protection to project-affected people through such measures, this should certainly be done, and should perhaps become a part of project planning in the future. We would urge that an early decision be taken on this, and that if found feasible, the scheme should be implemented speedily.

(3.11.2) Dr. Vasant Gowarkier's View

(3.11.2.1) The matter concerning the height of the dam is discussed by the FMG elsewhere in the Chapter which gives the technical analysis of the issues involved. It's not so much this analysis as its implication that would like to emphasise.

(3.11.2.2) In all humility I may state that in my scientific career from being a working scientist to becoming a scientific adviser to the Prime Minister, I have not come across a situation where, when the dam has already been raised to 80 m. , the canal construction completed upto 140 kms, most of the equipments ordered, an expenditure of about Rs.4000 crores incurred and in addition contracts amounting to over Rs.2000 crores already entered into that some very fundamental questions are raised by parties as to whether there should be a dam at all or whether its height could be reduced from its design figure 455' to 436', 422', 404' etc.

(3.11.2.3) The height of the dam decides the quantitative base, the foundation, the material etc. in short, the quantification of how many million tonnes of concrete - which having once been decided and got underway makes some crucial technical parameters, such as the height, totally irreversible. After spending and committing roughly

Rs.6000 crores for the dam, any consideration of a major change in the dam is too late in the day to be entertained. But this is precisely what is happening. Instead of quickly allowing a stage to be reached when the benefits of the dam can be made to begin to flow to the needy, the parties seem to be suggesting alternatives and demanding alterations, unleashing delays in the economic recovery from whatever has already been a very significant investment. I am not questioning their bonafides or intentions because I have no doubt that, these are beyond doubt and honourable. But I suspect a distortion in overall perspective can cause a technical project of such extreme complexity as the SSP appear totally de-professionalised in its public visibility.

(3.11.2.4) The proposal of height reduction is sought to be linked with the magnitude of the resettlement & rehabilitation (R&R) problem. At one end of the spectrum, there will be no R&R problem if there is no dam. But I would have thought that the concerned four States of the Indian Union sat through several years of the Tribunal deliberations and decided several years ago that this nation has the will and capability to resettle and rehabilitate the populace affected by a river basin project.

(3.11.2.5) The present proposal for height reduction from 455' to 436' was infact considered, deliberated upon and rejected by the NWDT which decided the dam height at 455' after taking into account, the carryover capacity required for obtaining 28 MAF water at 75% dependability at SSP, provision for silt storage, requirement for regulated releases for SSP, live storage, and the need to generate power at SSP in lieu of power generation proposed at Jalsindhi and also considering alternative FRL 436' and 490' for Sardar Sarovar. At FRL 455'; the gross capacity of reservoir is 7.7 MAF. The State of Madhya Pradesh had sought clarification on the points decided by NWDT i.e. in respect of the basis on which NWDT had raised FRL of SSP from 436' for irrigation alone to FRL 455' for power generation (page 45 of Further Report of NWDT). NWDT had clarified that at FRL 436', power generation would be possible only in ten months to the tune of 777 Mkw in a surplus year as against 1007 Mkw (at FRL 455') and only in seven months to the tune of 522 Mkw in a water-deficit year as against 856 Mkw. In other words, there would be a power loss of 230-350 Mkw (23 to 38%) every year and power generation would be seasonal (Page 45 Further Report). Madhya Pradesh also raised the issue of reduction in carryover storage and thus pleaded for height reduction (Page 51, 52 of Further Report). NWDT discussed each point in detail in their Further Report (pages 52 through 54) before giving Final Order. Thus, the NWDT decided the FRL @ 455' after going into exhaustive details including social, financial and technical aspects of the project. After 15 years, the same question is being asked again.

(3.11.2.6) The construction of Sardar Sarovar dam has been envisaged with respect to FRL 455'. Accordingly, all the parameters like inlets for power house, Canal Head Power House (CHPH) and other pertinent features have all been designed with respect to FRL 455'. It may not be practicable at this stage to revert these parameters to fit into the proposal of FRL 436' as that may make a substantial part of the work infructuose.

(3.11.2.7) Finally, I would urge most humbly that in the execution of a project of the SSP's complexity, the finality in technical matters be allowed to prevail and the project people allowed to get on with their jobs.

IV. RESETTLEMENT & REHABILITATION

4.1 Our Earlier Report

(4.1.1) We had dealt with this subject in a brief but compendious manner in our earlier Report and would suggest that the present chapter should be regarded as a continuation of Chapter V of that Report.

4.2 The Point of Reference

(4.2.1) The Supreme court has now referred the issue of Resettlement and Rehabilitation (R&R) back to us. We formulate the issue as follows:

- i) What is the magnitude of the R&R task in terms of numbers, categories, etc?
- ii) What is the governing philosophy and what are the main principles and conditions of R&R? Is there any conceptual problem or lacuna or lack of clarity here?

- iii) What is the current status of R&R vis-a-vis the status of construction activities?
- iv) What is the quality of R&R? What problems and difficulties have been experienced by the project-affected people and by the Governments? What kinds of hardships have occurred and what remedies are being applied?
- v) What is the machinery for implementation, monitoring, grievance redressal, etc.? How well is it working?
- vi) In the light of the answers to questions (i) to (v) above, what is this Group's overall assessment of the R&R situation in the project and what are its recommendations?

4.3 The Magnitude of the R&R Task

(4.3.1) There is no doubt that the numbers of project-affected people have gone up over the years. The NWDT had gone by an estimate of around 7000 families whereas current estimates are in the region of 41,000 families. This is the result of several factors. First, the figures available to the Tribunal were rough preliminary estimates whereas better estimates based on detailed surveys are now available. Secondly, with the progressive liberalisation of the R&R policies, the definition of "Project Affected Families" has changed over the years and this has resulted in larger numbers of families. Thirdly, the cut-off date for counting major sons has been shifting, resulting in more persons qualifying. Fourthly, there has been an increase in the population in these areas as elsewhere in the country, as can be seen from the differences between the numbers based on the 1981 census and those based on the 1991 census. The numbers now given in this Report are slightly higher than those mentioned in our earlier Report. Some of the processes mentioned above continue to operate and the numbers may increase further.

(4.3.2) The Status Report on R&R brought out by the Narmada Control Authority for the quarter ending December 1994 gives, the following information:

"As per the latest information, about 40,727 families would be affected due to submergence and back water effect. Statewise breakup of affected villages and number of affected families (PAFs) are given below:

(No. of PAFs)

States	Village affected			Families to be rehabilitated including major sons/daughters As per latest information (Dec., 94)	Population affected	
	Full	Partial	Total		1981 Census	1991 Census
Madhya Pradesh	1	192*	193*	33014	45000	89796
Maharashtra	-	33	33	3113@	11082	19650
Gujarat	3	16	19	4600	10593	18000
Total	4	241	245	40727	66675	127446

* Out of 193 submergence villages of Madhya Pradesh, in 30 villages 26% to 50%, in 14 villages 51% to 75%, in 4 villages 76% to 90%, and in 1 village 100% agricultural land will be submerged. In 61 villages only abadi (habitation) will be affected due to back water and in 9 villages only Government waste land will be submerged.

@ The number may increase to about 3300 after due verification of genuine PAFs."

“Different category of oustee families going to be affected in three States are as given below:-

State	Different category of Oustees (No. of PAFs)							Total
	Land Owners	Co-sharer	Encroachers	Tapu land holders (island holders)	Major sons	Landless agricultural labourers	Other Landless Lab.	
Gujarat	874	624	677	-	2222	180	23	4600
Maharashtra	428	-	1042	37	827@	779	-	3113#
Madhya Pradesh	9985	-	-	-	15018	5776	2235	33014
Total	11287	624	1719	37	18067	6735	2258	40727

@ Includes major unmarried daughters also.

Total number of PAFs may increase to about 3300 after due verification of genuine PAFs.”

“A large percentage of the affected population is of tribals, being 100 percent in Maharashtra and 97.4 percent in Gujarat. In Madhya Pradesh 29% population belong to Scheduled Tribes and 12% belong to Scheduled Castes. Details of the affected Scheduled Castes and Scheduled Tribes families and population in three States are as given below:-

Sub Caste	Gujarat		Maharashtra		Madhya Pradesh		Total Population	
	(Census)		(Census)		(Census)		(Census)	
	1981	1991	1981	1991	1981	1991	1981	1991
Scheduled Tribes (ST)	10287	17532	11082	19650	23240	26041	44609	63223
Scheduled Castes (SC)	-	-	-	-	3650	10775	3650	10775
Others	306	468	-	-	18110	52980	18416	53448
Total	10593	18000	11082	19650	45000	89796	66675	127446”

(4.3.3) The same Status Report gives the following picture of the total R&R task in its Table-2.

S. No.	State	Unit	PAF FAMILIES			
			By Origin	By State of Resettlement	That Require Agri. Land	That Require House Plots
1.	Gujarat					
	(a) Gujarat in Gujarat	No.	4600	4600	4577	4600
	(b) Maharashtra oustees in Gujarat		-	999	999	999
	(c) Madhya Pradesh settling in Gujarat		-	14124	14124	14124
				----- 19623	----- 19700	----- 19723
		%	11.29	48.43	87.00	48.43
2.	Maharashtra	No.	3113*	2114@	2114@	2114@
		%	7.64	5.19	9.34	5.19
3.	Madhya Pradesh	No.	33014	18890	830	18890
		%	81.06	46.38	3.67	46.38
4.	Total	No.	40727	40727	22644	40727
		%	100	100	100	100

* Likely to increase to 3300

@ Likely to increase to 2301

(4.3.4) The numbers mentioned above relate only to the submergence-affected people. This needs to be supplemented by information relating to others who may also be affected by the project in various ways. For this purpose (as mentioned in our earlier Report), there should be a complete census of all categories, groups, communities and individuals, affected in any manner whatsoever, including canal-affected persons, communities downstream of the dam, groups and individuals providing supplies and services to others and so on, so that the data-base needed for planning is comprehensive.

4.4 The Approach to Rehabilitation

(4.4.1) Details of the rehabilitation measures laid down by the NWDT and of the policies framed by different State Governments are given in Appendices V(1,2,3 & 4) to our earlier Report. As we had observed in that Report, the NWDT's award itself laid down norms and principles governing compensation and rehabilitation which represented a vast improvement over the earlier approaches; and the measures were further liberalised in response

to 'the representations of voluntary agencies, the points made by the World Bank during loan negotiations, the decisions of the Courts and so on. While there are some variations in the R&R policies from State to State, in general it can be said that all of them represent significant advances over past principles and practices. The World Bank's Independent Review (the Morse Commission), which was highly critical of R&R, praised Gujarat saying, "In 1987-88 Gujarat developed a policy for its villagers affected by the Sardar Sarovar Project (SSP) that has since been welcomed as among the most progressive package of measures ever devised for securing the long term rehabilitation of people displaced by large scale development projects." In its recent Draft Project Completion Report, the World Bank says that "it was the first time that such high standards of R&R were being applied to a project in India." For facility of reference, even at the cost of repeating what is contained in our earlier Report, we are reproducing in Appendix IV (1) a comparative statement highlighting the NWDT award provisions and the further liberalised policies of the State Governments, taken from the NCA's Status Report referred to above. A broad summary picture, also taken from the same source, is as follows:

"As per the NWDT stipulations the oustees have to be offered land in the command area of the project Gujarat has to accommodate all the people willing to migrate to that State from the States of Maharashtra and Madhya Pradesh so that the benefits of the project are fully shared by the people who get dislocated due to the reservoir submergence.

Resettlement of the persons affected by the project, their relocation, economic betterment and social integration at their new place of resettlement is the responsibility of the project authorities and the costs thereof are to be charged to the project. Option for the choice of relocation site rests with the affected people. The project administration and the concerned States have to help them accordingly.

NWDT award clearly stipulates that in no event shall any area in Madhya Pradesh and Maharashtra be submerged under the Sardar Sarovar unless all payment of compensation, expenses and costs is made for acquisition of land and properties and arrangements are made for the rehabilitation of the oustees therefrom in accordance with NWDT directions and intimated to the oustees.

Gujarat shall acquire and make available a year in advance of the submergence before each successive stage, irrigable land and house sites for rehabilitation of the oustee families from Madhya Pradesh and Maharashtra who are willing to migrate to Gujarat. Gujarat shall in the first instance offer to rehabilitate the oustees of Maharashtra and Madhya Pradesh in Gujarat territory.

Gujarat shall at each successive stage of submergence intimate to Madhya Pradesh and Maharashtra the area coming under submergence at least 18 months in advance. The inhabitants of the area coming under the respective stages of submergence will be entitled to occupy or use their properties without being required to pay anything to such occupation and use till a date to be notified by the state concerned which date shall not be less than six months before submergence. They must vacate the area by the notified date.

Supreme court has given directions in the Writ Petition No. 1201 of 1990 filed by Shri B.D. Sharma, Ex-Commissioner SC/ST. Government of India that rehabilitation should be so done that at least six months before area is likely to be submerged, rehabilitation should be completed and should be in respect of home-stead, substitution of agricultural property and such other arrangements which are contemplated under the rehabilitation scheme;"

(4.4.2) However, what we are concerned with is not so much the details of the various policies as the spirit behind them or the governing philosophy. This again is best captured in the summation given in the above-mentioned Status Report:

"Plans for Resettlement & Rehabilitation of the oustees are implemented in such a way so as to ensure that oustees shall promptly after displacement:

- improve the, standard of living or atleast regain the standard of living they had been enjoying prior to their displacement, and
- be relocated as village units, village sections or families in accordance with the oustees preference.
- be fully integrated in the community in which they are resettled.

- be provided with appropriate compensation and adequate social and physical rehabilitation infrastructure including community services and facilities.
- ensure adequate participation by the oustees in their Resettlement and Rehabilitation.

The basic approach of rehabilitation is to convert the dislocation into a potential beneficial opportunity for economic betterment of the project affected persons with State's support and resources.

The oustees are to make their own choice of relocation sites as per their own preferences out of three options given to them. This would then help to ensure the cultural, ethnic and other community oriented identity to the maximum extent possible.

The oustees or their representatives are being associated/involved in the implementation process of the R&R work. For Monitoring and Evaluation (M&E) of the R&R work, specialised social science agencies at the State levels have been engaged to evaluate the socio-economic status of the oustees before and after their resettlement. The detail key indicators have been identified and the same is being evaluated by M&E Agencies. The intention of the Government is to see that the socio-economic status, of the oustee families after resettlement, improves substantially."

(4.4.3) We must also take note of the definition of the meaning of "resettlement" given in paragraph 1.4.0 of the NCA's 1993-94 Annual Action Plan document:

"A PAF is treated as resettled if the following activities are completed for him:

- i. Compensation for land and properties going under submergence if any, has been paid.
- ii. Agricultural land and house plot have been allotted at the relocation site of his choice as per NWDT provision and State policies. House plot and financial assistance to acquire productive assets or purchase land provided to landless PAFs including major son in Madhya Pradesh.
- iii. Free transport has been availed by him to shift materials or has shifted his materials on receipt of transportation assistance.
- iv. Ex-gratia payment, rehabilitation grant, subsistence allowance, development assistance for pucca plinth of house etc. as per respective state packages have been paid or partly paid.
- v. Ration card has been issued at the relocation site.
- vi. Education, drinking water, medical facilities etc. are provided.
- vii. Irrigation facility/vocational training provided."

(4.4.4) The formulation of the objectives of R&R, the definition of "resettlement" and the stipulation of conditions outlined in the preceding paragraphs together constitute a very enlightened approach to this human problem and cannot easily be faulted. There are, however, a few inherent difficulties which need to be noted here. (We are referring to problems of concept, approach and policy and not practical problems of implementation which will be dealt with later).

These are as follows:

- (i) The "packages" offered by the different State Governments are not identical. We had taken note of this in our earlier Report and found it acceptable, but it has been argued that these differences have a bearing on the "free choice" offered to the PAFs in regard to location of rehabilitation, and further that when one State Government takes an enlightened view on a particular matter, say the entitlement of landless labourers or encroachers or unmarried adult daughters, that view should be adopted by the other State Governments.
- (ii) A lacuna in the policies, principles and conditions presented above is that the focus is on the people affected by submergence. As mentioned earlier (in paragraph 4.3.4), there is a range of people who do not fall into this category but who are nevertheless affected by the project in one way or the other.

- (iii) A new conceptual problem now emerging is the distinction sought to be made between temporary and permanent submergence. However, this will be dealt with later when we come to the practical problems and difficulties of implementation.
- (iv) There is also the question of 'encroachers'. Tribal, communities without formal title to land are described as "encroachers", but they have a longstanding relationship with the natural environment in which they live, and this has been recognised through regularisation in some areas. Where this has not been done, this creates a problem in regard to the tribals' entitlement to R&R packages.

4.5 Legal Framework

(4.5.1) The legal framework for R&R begins with the various principles, norms and conditions relating to the resettlement of 'oustees' laid down by the NWDI. These have been supplemented by orders of the High Court and other Courts in the States and the Supreme Court of India in various cases. All this has been translated into a set of R&R policies by each of the State Governments (Gujarat, Maharashtra and Madhya Pradesh). These policy statements, modified or added to from time to time are also part of the legal framework. There are also the conditions relating to R&R in the loan agreement with the World Bank for this Project. In addition, the guidelines of the Central Water Commission on the R&R aspects of water resource projects are also relevant; and the policies and principles laid down by the Union Home Ministry and the National Commission for Scheduled Castes and Scheduled Tribes have also to govern the R&R activities. The concerns of other Ministries such as the Ministry of Welfare, the Ministry of Labour etc. have also to be kept in mind. Finally, there are the conditions imposed by the Government of India, Ministry of Environment and Forests, while giving conditional clearances to the Project in 1987 from the environment angle as well as under the Forest Conservation Act; these were incorporated by reference in the Planning Commission's communication of 1988 accepting the Project for inclusion in the Plan. (These communications have been reproduced in the Appendices IV(1), (2) and (3) to our earlier Report). In the actual processes of R&R, the provisions and procedures of certain Acts, such as the Land Acquisition Act, the Environment Protection Act, the Forest Conservation Act, the Wildlife (Protection) Act, the Water (Prevention and Control of Pollution) Act, etc. have to be kept in view.

4.6 Institutional Arrangements

(4.6.1) The institutional arrangements relating to the R&R aspects of the Project have already been described in our earlier Report, but may be outlined here for the sake of completeness. The most important institution in this regard is the Narmada Control Authority which has been "charged with the power and the duty to do any or all things necessary, sufficient and expedient for the implementation of the Orders" of the Narmada Water Disputes Tribunal. Out of the six items listed for action by the NCA two were related to resettlement and rehabilitation as under:

- (1) "acquisition by the concerned State for Sardar Sarovar Project of lands and properties likely to, be submerged under Sardar Sarovar", and
- (2) "compensation, resettlement and rehabilitation of oustees".

At the time of giving conditional clearance to the Project in 1987, the NCA was reconstituted and its role was also expanded so as to enable it to exercise more effective supervision over the fulfilment of the environmental and R&R conditions. The constitution and functions of the NCA as also those of its R&R Sub-group have been given in Appendices IV(4) and V(5) to our earlier Report. The R&R Sub-Group is presided over by the Secretary to the Government of India, Ministry of Welfare, and apart from representatives of the State Governments concerned it also includes a few non-officials. Its observations and recommendations are considered not only by the NCA of which it is a sub-group but also by the Sardar Sarovar Construction Advisory Committee (SSCAC) which monitors the progress of the SSP. In the event of differences emerging at the meeting of the NCA and remaining unresolved, there is a provision for referring such differences to a Review Committee at the level of Ministers, the constitution and functions of which were also given in Appendix IV(4) of our earlier Report.

(4.6.2) The actual R&R work is carried out by the rehabilitation authorities in each State. There is also separate agency called the Sardar Sarovar Punarvasavat Agency in Gujarat.

(4.6.3) Apart from these arrangements, the loan agreement with the World Bank had stipulated that there should be a review of R&R from time to time by an independent Monitoring and Evaluation agency in each State. In accordance with this condition the Centre for Social Studies, Surat, in Gujarat, the Hari Singh Gour University of Sagar in Madhya Pradesh and the Tata Institute of Social Sciences in Maharashtra were appointed as the independent M&E agencies.

4.7 Current Status of R&R

(4.7.1) In the NCA's Status Report on R&R for the quarter ending December 1994 there is a Table (Table-3) entitled "Summary of Progress as on 31.12.94" which is reproduced in Appendix IV(2). This indicates the present position with reference to the total task of resettling and rehabilitating upwards of 41,000 submergence-affected families. The number affected so far are not yet a large proportion of the total, it is only in the years 1997/98 that the numbers will go up very steeply (from around 2,700 families in 1994-95 to over 31,000 families in 1997-98).

(4.7.2) A useful statement is the Table-IB entitled "Annual and Quarterly Plan for R&R with" Achievement during the 4th Quarter Ending March, 1994" given in Annex V to the 10th Report of the R&R Sub-group of the NCA to the Supreme Court. The Table is reproduced on the next page.

TABLE-III

STATE	1993-94 (QUARTERLY WORK PLANNED)																TOTAL TARGET		TOTAL ACHIEVEMENT			
	1 ST QUARTER				2 ND QUARTER				3 RD QUARTER				4 TH QUARTER				House Plots	Agri. Plots	House Plots	Agri. Plots		
	House Plots		Agri. Plots		House Plots		Agri. Plots		House Plots		Agri. Plots		House Plots		Agri. Plots		House Plots		Agri. Plots			
	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.	Target	Achi.		
GUJARAT	200	217	404	125	-	39	-	19	19	409	22	-	31	-	25	-	28	28	609	404	303	203
MAHARASHTRA																						
a) In Guj.	100	115	100	21	100	18	100	7	150	1	100	13	136	4	136	29	29	500	436	138	70	
b) In Hah.	200	122	200	122	-	-	-	10	200	17	200	16	100	10	100	17	17	500	500	149	165	
Total	300	237	300	143	100	18	100	17	350	18	300	29	236	14	236	46	46	1000	936	287	235	
MADHYA PRADESH																						
a) In Guj.	800	141	1000	138	500	240	-	72	900	88	1200	323	800	430	800	400	400	3000	3000	899	1013	
b) In Hah.	-	-	150	-	-	-	-	-	1000	84	150	-	1000	340	-	-	-	2000	300	424	-	
Total	800	141	1150	138	500	240	-	72	1900	172	1350	323	800	770	800	400	400	5000	3300	1323	1013	
Grand Total	1300	595	1854	*506	600	297	100	108	2659	212	1650	383	1036	809	1036	554	554	6609	4640	1913	1451	

Source: 10th Report of the R&R Sub-group to the Supreme Court.

* This seems to be a misprint for '406'.

(4.7.3) Another pertinent statement is the information relating to the position of R&R with reference to specific stages in constitution namely EL 69 M and EL 80.3 M. This information is reproduced in Appendix IV(3). The NCA states that the R&R is complete in relation to the height of 80 M. It is understood that the word “complete” is used here in the sense proposed in the Joint Affidavit of the Government of India and the four participating State Governments, which is referred to in paragraph 4.9.3 below.

4.8 Quality of R&R and Problems

(4.8.1) Submissions to the Group*

(4.8.1.1) The Government of India’s submission is to the following effect. There are comprehensive R&R policies which are also being constantly improved. There are comprehensive and exhaustive R&R plans and their implementation is being monitored by the R&R Sub-group of the NCA. Reports are also being made by the Sub-group to the Supreme Court from time to time. The Supreme Court’s instructions are being followed. The States are fully alive to the impacts of the dam on the downstream areas though these will take a few years emerge. In regard to the release of forest land for rehabilitation purposes, there has been no conflict and no secondary displacement as apprehended by the FMG. There is an effective linkage between construction and rehabilitation and the SSCAC will not permit construction to proceed without taking into account the reports of the Environment & R&R Sub-groups. There is an elaborate mechanism of consultation of the people, and their problems are being looked into. Grievances are being attended to by the R&R Sub-group. No instances of forcible eviction have been brought to the notice. There are social science agencies of repute undertaking the monitoring and evaluation of R&R work. ‘The tribals are being dealt with, with the utmost care. There are grievance redressal mechanisms. There is also an active involvement of voluntary agencies.

(4.8.1.2) The Gujarat Government state that the rehabilitation policy framed by the State Government is one of the most liberal policies framed anywhere in the world; that there is complete involvement of the beneficiaries in the sense that they are given the freedom to select the place where they wish to resettle; that in the process, the tribals select places that ensure the preservation of their cultural and social identity; and that this enables the project-affected people to resettle in the new location with minimum disturbance to their social and cultural life. The GOG state further that the stipulations of the NWDT regarding the issue of notice of submergence and the arrangements of resettlement are being adhered to; that there is a separate agency called the Sardar Sarovar Punarvasavat Agency to look after the task of R&R; that NGOs like Arch Vahini and Anand Niketan Ashram are actively involved; and that the State Governments are causing minimum disturbance to the affected, people. The GOG have also enumerated the various decisions taken from time to time progressively liberalising the R&R measures. They have outlined the procedures for the listing of PAPs (List Committee) and for purchases of land (Land Purchase Committee). They state that the scope of beneficiaries has been widened and that non-agricultural beneficiaries have also been identified for the benefits of rehabilitation; that a detailed survey has been made of canal-affected persons; that the Government has decided to extend the benefit of rehabilitation to the small and marginal farmers; that while the identification of the affected persons downstream of the dam is premature, the task has already been taken up; and that a specific package of benefits has also been extended to the identified persons of the six villages located near the project site whose lands were acquired around 1952. There is said to be a close interaction with the NGOs and the oustees. It has also been stated that the tribal population make their own choice of resettlement sites primarily based on their cultural affinities and social relations and also continuity of their hamlet-like structure within the village, and that they have not agreed to select sites for entire villages as a whole. GOG have outlined the arrangements for the purchase of land in the command area and claim that they have implemented the recommendations of the FMG without even introducing legislation in this regard. A detailed Master plan is said to have been already prepared with time schedules and that it is stated that the process of displacement is done smoothly and with as little psychological trauma to the PAPs as possible. GOG further state that appeal and grievance redressal mechanisms exist; that R&R is carried out in a humane manner; that there is adequate involvement of the people; that there is a system of due process followed by the flow of information; and that the orientation of the bureaucracy suggested by us has already been ensured. There is also a reference to the Manibeli incidents: the GOG state that most families have already accepted land in Gujarat, but because of outside influence some families are being persuaded to stay in Manibeli. They add that no case has come to light where the PAPs

* This paragraph gives only brief summaries of the important points in the various submissions.

have returned to M.P. for the reason that possession is not given by the seller. Some PAPs who were landless labourers are said to have difficulties in cultivating lands and therefore to have returned to M.P. for jobs after giving their land to local agriculturists for cultivation. They also add that it is only with the passage of time that PAPs would be able to mix and blend with the new social environment. It is stated that some issues come up which are being overcome by the Government and that the problem of cattle grazing has been solved. Finally, they say that the GOG is ready and willing to provide and extend all facilities to oustees, if they so desire to resettle in Gujarat.

(4.8.1.3) The Government of Madhya Pradesh have mentioned a number of difficulties and problems relating to R&R, such as the steep increase in the number of Project Affected Families in M.P. (from 6147 at the time of the NWDT Award to the present estimate of 33014); the inability of the Government of Gujarat to give adequate land before each stage of submergence; the difficulty in finding sufficient irrigable land in the command area of the Project, which will force the PAFs in the later stages of submergence to accept resettlement much farther away in a different social and cultural milieu, or alternatively outside the command of the SSP; the failure to resettle villages/hamlets as composite units; the non-establishment of independent rehabilitation villages; and so on. They have also referred to certain common problems noticed in all the relocation sites such as the absence of approach roads and related facilities; the absence of grazing land or alternatives like stall feeding arrangements, forcing some PAFs to send their cattle back to their original villages; the aggravation of the problems of the PAFs by the absence of the facilities they were earlier enjoying from adjoining forests; accommodation in uncomfortable tin-sheds lacking ventilation; contamination of drinking water wells; absence of Hindi teachers in schools; the difficulties of getting jobs in Gujarat despite requisite qualifications; difficulties created by a lack of knowledge of Gujarati and/or English; waterlogging of transit accommodation and also agricultural land; etc. Other problems mentioned include the refusal by the original land-holders (because of incomplete payment) to allow the PAFs to cultivate the land allotted to them, hostility on the part of neighbours and co-villagers in some cases, insecurity arising from the operations of anti-social elements, etc. As a result of some of these factors, 122 families are said to have returned to M.P. It has also been stated that 109 families out of the 447 affected are not accepting the award and are neither prepared to migrate to Gujarat nor to shift from their present places. Apart from these problems, the Government of Madhya Pradesh have also referred to some differences of opinion between them and GOG. They say that it is the GOG's view that landless agricultural labourers of the 'marginally affected' villages (i.e. where the submergence does not exceed 25%) are not entitled to the R&R package because there is no loss of occupation. There is also a difference of opinion in regard to the treatment to be given to the families affected by temporary submergence, the Gujarat Government taking the view that they should be settled at a higher elevation and that their rehabilitation should not be a pre-condition for raising the height of the dam. In the light of all these problems and difficulties, the Government of Madhya Pradesh have proposed that the magnitude of the R&R problem should be reduced by reducing the height of the dam. The GOMP have also stated that amendments to Articles 341 and 342 of the Constitution would be needed to ensure that SC/ST PAFs, on their migration to Gujarat for the purpose of R&R do not lose the rights, privileges, and benefits to which they are entitled; that they have made proposals in this regard to the Government of India, Ministry of Welfare, who have sought the opinion of the Government of Gujarat; and that the GOG's opinion is awaited.

(4.8.1.4) The NBA's present submission is supplementary to the presentations made and the material submitted by them to this Group last year. It is partly in the form of a critique of our report of April, 1994. The important points made in the NBA's submission are the following:

- (i) There can be no differences in the entitlements across the States if the choice given to the oustee families is to be real.
- (ii) Justice needs to be done to the families affected by the project colonies, especially Kevadia Colony, and those affected by afforestation works as a part of Compensatory Afforestation or Catchment Area Treatment.
- (iii) Compensatory Afforestation and Catchment Area Treatment have been resulting in the displacement of tribals in all the three States from their lands under cultivation.
- (iv) Serious conflicts have emerged between hundreds of tribal families in the districts of Dhule (Maharashtra) and Jhabua (Madhya Pradesh) and the Government departments.
- (v) Land availability is an important issue. There is no land in Madhya Pradesh and hence no rehabilitation would be possible for PAPs who choose to remain in M.P. (and they should be free

not to choose Gujarat). Land availability in Gujarat itself is not established. In Maharashtra, only forest land is made available and this too creates problems.

- (vi) Cultivators in Akrani Taluka have been termed as “encroachers” in the most unjust way, as land settlement in those areas was never completed to grant them rights.
- (vii) Release of forest land for rehabilitation leads to the destruction of forests. It is not possible to agree to release more and more forest land.
- (viii) The idea of legislation to provide land in the command area is complex and politically problematic. The experience of the Maharashtra Act shows that such land acquisition is not so easy. The extension of this to Gujarat does not seem practicable.
- (ix) Non-land based rehabilitation will not be acceptable for agriculturist PAPs (landowners and labourers), especially the tribals*. It will be retrograde to go back on the principle of land for land. If land availability is a problem, the justifiability of the project must itself be examined.
- (x) The feasibility of R&R remains in doubt until a credible Master Plan is ready. When the Master Plan is not ready 15 years after the NWDT Award, it is unlikely to become ready in the next six months*.
- (xi) The obvious failure of the monitoring structures has had terrible consequences for the affected people. There has been a sidelining of the independent agencies. The R&R Sub-group has practically no independent person on it; it does not meet often despite the requirement of submission of monthly reports to the Supreme Court; and it has shown a singular lack of sensitivity towards the affected people. The suggestion of an Ombudsman is inadequate*. What is required is a full-fledged monitoring structure with sufficient powers and with independent people who will not hesitate to use them.
- (xii) The NBA concludes by saying that the conditions of those displaced so far and “resettled” whether in Gujarat, M.P. and Maharashtra is, terrible; and that under such circumstances it is necessary to ask that the complete feasibility of just and proper R&R be established beyond doubt before any further displacement or irreversible work can take place. They call for a stoppage of work on the dam. It is their view that to allow work to continue while fundamental issues remain unsolved will be a blatant violation of the people’s fundamental right to life.

(4.8.2) Reports by Official Agencies

(4.8.2.1) At our request copies of the agenda notes and minutes of some of the more recent meetings of the R&R Sub-group of the NCA, the NCA itself and the Sardar Sarovar Construction Advisory Committee (SSCAC), as also the 9th, 10th & 11th Reports of the R&R Sub-group to the Supreme Court, were made available to us. Extracts from these various documents are reproduced in Appendix IV (4). We have also seen the reports of two field visits which were annexed to the M.P. Government’s submission.

(4.8.2.2) While these records, do give evidence of well-meaning efforts to deal with difficult problems, they also show that there are persistent differences between the State Governments. The M.P. Government repeatedly refers to difficulties in regard to the availability of the land and the absence of irrigation facilities. There are also differences between the M.P. Government and the Gujarat Government about the entitlements of landless labourers, PAFs from marginally affected villages, the distinction between temporary and permanent submergence, and so on. The M.P. field visit reports also refer to problems regarding drainage, thefts, absence of hand-pumps, lack of fodder and grazing facilities, non-acceptance by host community, difficulties in regard to title, requests for change of land, etc., as also some complaints about schools, absence of Hindi teachers, etc.

(4.8.2.3) At the 27th meeting (18.10.94) the Chairman of the R&R Sub-group expressed concern that the State Governments did not seem to be “effectively gearing R&R work to match the required elevation of the dam to make the SSP worthwhile to a minimum extent for the purposes for which it had been conceived and was being executed.” He further observed that “in the face of all this what seems to be happening was that time-bound construction schedule was not being laid down in the absence of definite R&R schedule which in turn was not being properly implemented in the absence of definite time frame for raising of dam height.” He also stated that he got the impression

* These comments are with reference to the observations/recommendations in our earlier Report.

that “perhaps left to themselves they would not like to be a party to go beyond the present EL 69 M and reorganise their R&R work in a manner which could permit further raising in the height of the dam beyond EL 69 M.”

(4.8.2.4) At the 56th meeting of the Sardar Sarovar Construction Advisory Committee (SSCAC) held on 1st December, 1994, the fact that the dam height had been raised in a couple of blocks by 1 m and 2 m respectively above the approved levels came up for discussion. The Minutes state as follows:

“A statement indicating the construction levels of the dam blocks achieved upto 30th November, 1994 vis-à-vis the progress till June, 1994 as circulated by the Govt. of Gujarat alongwith L-Section of the dam profile (enclosed as Annex-III) indicates that in 3 blocks - 2 auxiliary spillway blocks and one composite block, the dam height had been raised by 1 m and 2 m respectively above the levels approved by the SSCAC in the previous meetings. Madhya Pradesh expressed serious concern at this lapse on the part of the Govt. of Gujarat and suggested that such deviations should not be allowed to occur at all. Govt. of Gujarat clarified that this had taken place for technical reasons and was not done intentionally.

The Committee after detailed discussions decided, as under:

- (A) SSNNL shall strictly adhere to construction schedule approved and ensure that dam height as approved by the SSCAC from time to time is not exceeded at any stage in future.
- (B) The construction of the dam shall proceed between blocks 30 and 43 of the spillway upto E.L. 80.3 m as approved in the 55th meeting till a further review is taken on the progress of pari-passu implementation of R&R works in the next meeting of the SSCAC which is proposed to be held early January, 1995.”

We must also take note of the fact that an attempt by the GOG to advance the schedule of construction without adequate regard to the R&R aspects led to infructuose expenditure and invited adverse comments from the Comptroller & Auditor General of India. (extracts in Appendix IV(5)). The above instances show that those responsible for construction tend occasionally to go beyond the approved limits; that when this happens, the institutional arrangements are such that they are stopped; and that the root cause of the trouble is that R&R work tends to slip behind the, schedule.

(4.8.2.5) Further, at the 57th- Meeting of the SSCAC held on 3 January 1995, there appears to have been a lack of complete agreement on the further construction programme, and the minutes state: “It is, therefore, decided by the SSCAC that the work can be carried out as proposed keeping in view the observations made by M.P. and Maharashtra. However, if any party State has reservations/objections to the programme, they are free to take recourse to appeal to RCNCA as provided in the award.” We are not entirely clear how the question of a reference to the Review Committee arises if construction work proceeds with due regard to the observations of the participating States and the status of R&R. In any case, if any differences arise in the SSCAC and are not resolved, it appears to us that they should be referred to the NCA; it is our understanding that the Review Committee is meant for resolving differences arising in the NCA and not the SSCAC.

(4.8.3) Reports by Independent M&E Agencies

(4.8.3.1) In accordance with the conditions of the World Bank loan independent monitoring and evaluation agencies to report periodically on the R&R activity had been appointed in each of the States : Centre for Social Studies, Surat in Gujarat, Doctor Hari Singh Gour University of Sagar in M.P., and the Tata Institute of Social Sciences (TISS) in Maharashtra. These agencies had been making, periodical reports, but after the Government of India decided to withdraw from the World Bank Loan agreement, there, seems to have been a slackening in these arrangements. The Centre for Social Studies in Surat continues to make reports but these are, relatively infrequent. The M&E arrangements in M.P. do not seem to be active at present. In Maharashtra, the State Government appear to have terminated the arrangements with TISS and are said to be thinking of alternative arrangements; but none seems to have been made so far.

(4.8. 3.2) There has been a controversy between the Tata Institute of Social Sciences and the Government of Maharashtra with reference to a couple of Reports by the former containing a number of critical comments which the latter has rejected. We do not propose to enter into that controversy. However, the following observations of a general nature from a Summary Report of July, 1994 seem to be of some cautionary value: “unless the dam oustees are convinced that they will be appropriately rehabilitated, they will refuse to move out, and those shifted

forcefully will eventually return to their original villages..... Left with hardly any options, the villagers will either move further up the higher ranges of Satpudas and live a life cut-off from the outside world or move out to the plains only to be completely dispossessed one day and forced to migrate to live in urban slums in due course of time.”

(4.8.3.3) The latest report (the 19th Report) by the Centre for Social Studies, Surat, for the period April '94 to September '94, concentrates on the specific theme of the farmer's own coping mechanism when farm productivity is adversely affected by erratic rainfall, and goes into technical details of calorie intake, consumption expenditure, agricultural technology, fertiliser use and so on. However, it has some thoughtful observations of a general nature, such as the following:

“The traditional social links and institutions at the submerging villages had important place in the life of oustees. These arrangements had helped sustaining the oustees in the submerging villages under harsh environment. Even in worst of the situations the system was enabling a minimum level of consumption. The randomness of relocation in absence of these traditional arrangements at the new sites has made the oustees vulnerable to exploitation and subsequently risk aversion.”

“Ousteas (a) are unfamiliar with the complexities of market, (b) have little entrepreneurial capabilities to create their own economic institutions, and (c) are unable to respond under unfamiliar environment. Thus, it becomes pertinent on the part of the Nigam to facilitate the rehabilitation process by understanding first farmers' own adjustment mechanism and then strengthening it by external support.”

(4.8.3.4) The M&E Report of the Dr. Hari Singh Gour University of Sagar, Madhya Pradesh for the period ending March 31, 1993, contains the following observations:

“The point that we want to emphasise here is that there should be a legally empowered administrative apparatus in the field, which could take care of the grievances of affected people quickly and justifiably. This is necessary to earn the confidence of oustees. A close observation of the agitations in affected areas suggests that the central cause of their agitation is not against the construction of the dam. Attributing the agitation to any environmental issue is also an erroneous judgement of the hard reality;”

“The anger of the affected people is that they are not getting fair treatment. Thus, we see that the reality is not exactly the same as it is publicised or said to them. The terms of compensation are alluring only in the books. They are not receiving, the treatment as, is prescribed in the scheme of compensation awards. Situation is adverse not because of their anti-dam stand as it is being projected by [...] and the media. Once they are given compensation and benefits according, to the prescribed and approved rules of NWDT awards, the agitation can be easily arrested to a convincingly satisfying point.”

“Procedural wrangles on the way of compensation distribution of aids should be simplified creation of an administrative machinery with well defined powers for making speedy disposal of compensation cases is the urgent need of the hour to earn confidence of the oustees. The condition of resettlement is also far beyond the general expectations of the oustees. On the name of house, oustees are made to live in temporary constructed tin-sheds. Other facts of social amenities are in utterly poor shape. Instead of being point of attraction, majority of oustees develop distaste for that. A concerted effort should be made to evolve an administrative set-up which is capable of materialising the schemes of compensation in its true spirit with, accountability.”

(4.8.4) Reports by Committees set up by the M.P. Maharashtra Governments

(4.8.4.1) The Government of Madhya Pradesh had set up a Committee of MLAs to look into the rehabilitation of Sardar Sarovar oustees. This Committee (Sardar Sarovar Visthapit Jaanch Samiti) under the Chairmanship of Dr. Ram Chandra Singh Deo, MLA, submitted an interim report on 10 December 1994 and a final report on 21 December 1994. These reports mention numerous problems, difficulties, lapses, hardship and so on. These points are not being reproduced here, as they broadly fall under one or other category of the problems mentioned by the Madhya Pradesh Government in their submission (vide paragraph 4.8.1.3 above). The Committee finds the situation very unsatisfactory and comes to the conclusion that the major responsibility of resettlement of the displaced people is going to be that of MP. It suggests that the Government of MP should invoke the relevant Clause in the Tribunal's Award in terms of which MP can resettle the displaced people at Gujarat's cost if Gujarat is incapable of resettling them. The Committee feels that grave injustice has been done to the displaced people of MP and

suggests that recourse might be had to the provision in the Tribunal's Award for the resolution of disputes through the appointment of an umpire by the Chief Justice of India. The Committee considers the problem of displacement to be "a human problem of vast dimensions, specially as it involves the Adivasis and the backward classes" and says that "the construction of the dam should be stopped till the ousted persons are properly rehabilitated." It adds that "it is important that a human solution has not been found for the project-affected people." The Committee refers to the M.P. Government's proposal to reduce the height of the dam and says that this would automatically reduce the number of project-affected people.

(4.8.4.2) The Government of Maharashtra had also set up a Committee consisting of Shri Manekrao Gawit, Member of Parliament and Shri Vivek Pandit, to investigate the rehabilitation of people from Maharashtra affected by the SSP. This Committee submitted its report, on 17 December 1994. It has made a number of recommendations. Among these, one is to the effect that permission to raise the construction of the dam should not be granted till oustees have been wholly rehabilitated and legally relocated according to NCA and SC principles. The Committee also refers to the problem [...] encroachers and recommend that the land survey should be immediately completed so that they can become entitled to rehabilitation. The Committee further recommends that a non-governmental committee consisting of representatives of the Government and the Andolan should be constituted to improve cooperation between PAPs, NGOs representing PAPs and the Government, to see that rehabilitation is completed in a timely, smooth and effective manner. They suggest that the Committee should report to the Chief Minister once in every six months. The comments of the Government of Maharashtra on this Report, as furnished to the Central Government, have been made available to us and are attached as Appendix IV(6). These are to the effect that the problems mentioned have mostly been attended to. The recommendations of the Committee are said to be under the examination of the Government of Maharashtra.

(4.8.5) The World Bank's Present Views

(4.8.5.1) In the draft Project Completion Report on the Sardar Sarovar Project prepared by the World Bank in September '94, there are some important observations on R&R. While it is true that it is a draft report and may undergo some changes, these observations indicate the current thinking in the World Bank, at least at certain levels. They observe that "because this was the first time that such high standards of R&R had been applied to a project in India all concerned underestimated the complexity and time required to resettle and rehabilitate over 100,000 people"; and that "ultimately because of the efforts of the Bank and also the role played by NGOs and the Independent Review, the project has been the source of many improvements in R&R". They refer to a number of difficulties faced by the R&R component of the project but add that "most of these issues were resolved satisfactorily except for the survey of oustees in Maharashtra whose resolution continues to be hampered by dam opponents". In their view, "a long learning process led to what can now be considered a reasonably well structured programme"; and "although implementation still exhibits weakness, the Sardar Sarovar Project R&R programme has set new policy and implementation standards which can be applied in future resettlement programmes". They note, however, that concerns remain about the extent of land options being offered for Madhya Pradesh oustees who wish to remain in that State. Among other observations made by them are the following: that while the civil engineering aspects of the project were well understood, the complexities and issues associated with large-scale R&R operations were not adequately appreciated; that the latest estimates of the numbers affected are still not final because of anomalies persisting in NCA's R&R Status Report of May 1994; and that the multiplier coefficient between the number of families and the population affected varies considerably from State to State. The World Bank feels that the lack of prior consultation with the affected families is probably one of the major reasons for the difficulties encountered in carrying out socio-economic surveys, preparing satisfactory R&R policies and plans; and implementing them in a satisfactory manner. It also points out that throughout project implementation, the Government and the activists opposing the dam were unable to establish a dialogue of any kind; and that in Maharashtra, the Government on a few occasions used intimidation and even force to reduce opposition during the submergence of Manibeli, the resettlement at Taloda and the implementation of socio-economic surveys in non-cooperative villages, but to no avail.

4.9 Our Assessment

(4.9.1) In the light of the material summarised or referred to above, we have tried to make an overall assessment of the R&R situation. Numerous problems are referred to repeatedly in these records but not all of them are major; some can be relatively easily dealt with. For instance, complaints about school facilities, Hindi Teachers, dispensaries, non-working hand-pumps, and so on, can be attended to without much difficulty. Others, however,

are somewhat more difficult to handle. Complaints about the availability of land, the quality of the land allotted, the fact that it is not irrigable in many cases, problems of drainage leading to the waterlogging of both transit accommodation and agricultural land, etc., are not easily remedied. Limitations on the availability of land and in particular of plots of adequate size, and the consequent dispersal of PAFs over numerous sites, departing from the principle of community resettlement, are serious problems. GOMP's apprehensions that PAFs in the later stages will have to accept land in distant parts of the command area or alternatively outside the command area, cannot be dismissed. Difficulties arising from the lack of clear title, or from the continued assertion of their rights by landowners who have not been paid off fully, are not minor. Complaints about inadequate notice to the submergence-affected families, and the criticism that the free choice of the resettlement site tends to get limited in practice through various circumstances, have also to be noted.

(4.9.2) Even in the best of cases, the uprooting of families and communities (particularly tribal ones) from their old ways of living, the severance of their links with the surrounding environment and the natural-resource base, and their relocation elsewhere, are fraught with difficulties which may not be appreciated in full measure by the authorities in charge of rehabilitation. The integration of these immigrant families in the resettlement areas, their adjustment to new ways of living and new kinds of agriculture, and their acceptability to the neighbouring villages, are bound to be long-drawn processes. As regards the mechanisms of consultation and, the redressal of grievances, both the Government of India and the State Governments claim that these exist, but the question is whether they are fully sensitive and responsive to the complexities and nuances of the problems that arise.

(4.9.3) In the effort to cope with their difficulties, the Governments, Central and State, are trying to simplify their task in some ways such as the following:

- i) Landless labour in villages which are 'marginally affected' (where the submergence is less than 25%) are held to be not entitled to R&R benefits.
- ii) Relocation sites 'where the number settled is less than 500 are said to be ineligible for certain facilities such as school, dispensary, panchayat, etc.*
- ii) The Tribunal had stipulated that land should be offered a year in advance. The Supreme Court had said that rehabilitation should be completed six months in advance of submergence. (A copy of the Supreme Court's Order is attached as Appendix IV(7)). Now it is being argued that even this time-limit of six months presents difficulties and that the time-limit is not practicable.
- iv) A distinction is sought to be made between permanent and temporary submergence, with the former alone warranting the R&R package whereas the latter needs only temporary accommodation at a higher elevation. In a joint affidavit filed in the Supreme Court in June '94 by the Government of India and the four participating States it has been argued that this distinction is in accordance with the Tribunal's directives. (Appendix IV (8)).
- v) Finally, there is an attempt to change the very definition of 'rehabilitation'. In the joint affidavit referred to above it has been argued that the action taken by the rehabilitation authorities to offer alternative land, house plots and compensation six months in advance, may be taken as the fulfilment of the legal obligations stipulated under the Award.

We strongly urge that there should be the strictest adherence to the NWDT's stipulations and the Supreme Court's decisions and the closest conformity to the declared philosophy and principles of R&R. There should be no compromise in this regard.

(4.9.4) In the submissions of the Governments as well as in the proceedings of the various Committees referred to earlier there is repeated reference to the difficulties faced by the administration because of resistance by the PAFs under the "undue influence" of "hard-core" activists; there are also complaints about "misinformation" and "dis-information" by activists. We would leave it to the NBA to answer these charges. If there have been such instances we would deplore them. However, it seems to us that if people have readily responded to such calls and decided to take on the might of the state, they must have had some apprehensions and anxieties of their own; the call of the NBA must have struck a chord in them. The Governments, State and Central, need to ask themselves

* The dispersal of PAFs in a large number of sites is bad enough, but the position becomes even worse when that dispersal leads to the number of people in a given location being small and when this in turn disentitles them to certain facilities.

why an R&R package which is claimed to be very liberal fails to enthruse some people. The apprehensions and fears of the people must be understood and allayed and not dismissed as unreasonable or as 'entirely the result of 'undue influence'. The answer to 'misinformation' and 'disinform-ation' is information, and an abundance of it.

(4.9.5) In Gujarat Government's submission it has been stated: "Unfortunately instances have occurred where despite this arrangements as stipulated in the award have been made for resettlement, the affected people are being prevented from shifting from the submerging village. State Government is of the opinion that in such cases there is every justification for compulsory rehabilitation." Even under such circumstances, we would suggest that persuasion, information, and a gentle, humane and considerate response to apprehensions and anxieties, are the only answers. If 'development' is the objective and if humaneness is the declared principle, such difficulties should not be treated as law and order problems. However, if in fact certain groups are being unreasonably on-cooperative, we would, suggest that the Government can have recourse to the Ombudsman for the redressal of grievances which we had recommended in our earlier Report.

(4.9.6) Our understanding of how the project got into such difficulties on the R&R front is as follows. In the earlier stages there was perhaps an inadequacy of appreciation of the magnitude and complexity of the R&R task relating to this project. Without sitting in judgement on the planners and administrators of the past with the wisdom of hindsight, it would probably be true to say that the project was embarked upon without the fullest possible appreciation of the intensity and diversity of its adverse impacts, leaving these matters to be worked out as the implementation of the project proceeded. In this process difficulties have been encountered which have had the effect of slowing down the implementation itself. In response to emerging problems, the authorities have kept refining and improving the various R&R policies and measures, partly because of the efforts of voluntary agencies to bring the difficulties of the affected people to notice. Over the years the task has become larger and the administrative difficulties have grown; and this is reflected in the proceedings of the R&R Sub-group, SSCAC and the NCA. The difficulties are likely to increase substantially in the context of the huge numbers which will be affected in 1997 and 1998.

4.10 Our Recommendations

(4.10.1) We have observed that R&R has been, and notwithstanding considerable efforts on the parts of the Governments concerned, continues to be, the weak link in the chain. It has been the cause of delay in the progress of work and the subject of controversy transcending the borders of the participating States. We have stated elsewhere that the R&R package in each of the States is an improvement over any that has been adopted in any other project hitherto in India. We have also pointed out that there are important stipulations and conditions laid down by the NWDT and the Supreme Court. Further, there is an elaborate institutional framework, details of which have been given earlier, the most important of which are the NCA and its R&R Sub-group. The R&R Sub-group also submits periodical reports to the Supreme Court. Lastly, there are independent Monitoring and Evaluation agencies. The clearance given to the project in 1987 imposed a number of conditions. It has also been clearly laid down that the construction work must be linked to the fulfillment of the R&R requirements. If inspite of all these factors, there have been problems in the R&R operations, this has to be attributed, among other things, to the inability of the machinery that has been set up to perform as effectively as needed to ensure the implementation of the R&R and the progress of the work.

(4.10.2) We have given anxious consideration to the above, and keeping in mind also our assessment in paragraph 4.9 above, we propose to suggest steps:

- (i) to activate some of the components of the frame-work like the M&E agencies which in some cases have not been fully effective;
- (ii) to improve the representative character of the monitoring and reporting groups; and
- (iii) to provide an apex agency that will have the power as well as the credibility for fairness to ensure just decisions when grievances are represented.

(4.10.3) We would first like to draw attention to and reiterate several recommendations made in our earlier Report:

- (i) a complete census of all categories, groups, communities and individuals affected in any manner whatsoever by the project;

- (ii) the evolution of a number of category-specific rehabilitation packages;
 - (iii) a re-examination of the approach to and concepts of R&R in the light of the various actual difficulties which have been experienced;
 - (iv) legislation to give those who bear the social costs of the project, a share in the benefits as a prior right;
 - (v) with reference to the foregoing, the preparation of a Master Plan with detailed time schedules within six months* ;
 - (vi) strict adherence to NWDT and Supreme Court injunctions regarding rehabilitation well in advance of displacement;
 - (vii) the humane administration of rehabilitation and the necessary orientation of every level of the bureaucracy;
 - (viii) an ombudsman for grievance redressal; and
 - (ix) full and timely flow of information to the people and the fullest cooperation with the voluntary agencies.
- (N.B. (i) In our earlier report we had recommended the appointment of one Ombudsman in each State. On reconsideration, we feel that this would create difficulties. Though different States are involved, there is only one Project, and we feel that there should be only one Ombudsman with appropriate arrangements to hear grievances in different States and areas and with adequate support.
- (ii) On the question of uniformity in the R&R packages across the States, there is a difference of views within this Group. Prof. V.C. Kulandaiswamy and Dr. Vasant Gowariker continue to hold the view expressed in our earlier Report that the R&R packages of the different States need not be identical. They feel that some elements may be more generous in one State and others may be more generous in another State, and the package has to be taken as a whole. In their view, it is not desirable to split the package into components, make comparisons and choose a combination of the best in each to make a package. Shri Ramaswamy R. Iyer and Shri L.C. Jain feel that considering that the SSP is one project and that the PAPs have to be given a free choice to accept resettlement in their own State or in Gujarat, their free choice should not be affected by differences in the R&R packages of different States. They feel further that the most enlightened elements in all three packages should be put together to form a common package.)

(4.10.4) In addition to the above, we make the following further recommendations:

- (i) find speedy just and humane solutions to the problems of colony-affected people, “encroachers”, the land rights of tribals, and the problems of landless labourers;
- (ii) minimise dispersal and ensure community settlement as far as possible;
- (iii) even in those settlements where the number is less than 500, ensure that the people are provided with or given access to basic amenities and facilities such as school, dispensary, etc.
- (iv) make people’s participation a reality through proper institutionalisation including, if possible, periodical public hearings in both the submergence and resettlement areas;
- (iv) establish appropriate mechanisms to ensure the free and timely flow of information to the people;
- (v) operationalise the Ombudsman idea speedily; the Ombudsman should be appointed by the Government of India in consultation with the Chief Justice of India and should not be removable without the Chief Justice’s approval; while the Ombudsman will be primarily concerned with the redressal of the people’s grievances, complaints that the Governments may have about unreasonable non-cooperation by the people may also be brought within its purview;
- (vi) change the nature of the R&R Sub-group from a predominantly official committee to a more broad-based one with an adequate non-official component, including not merely a few selected non-

* This time-limit was laid down in our earlier Report. We hope the work is in progress and will be completed soon.

officials but also members who will represent the viewpoints of the affected people effectively, as also representatives of the NGOs assisting them or associated with the R&R work; make similar changes in the structure of the Environment Sub-group; while the recommendations and decisions of the Environment and R&R Sub-groups may be subject to review by their principal, namely the NCA, they should be binding on the SSCAC;

- (viii) reactivate the Monitoring and Evaluation arrangements; ensure their independence by providing for the selection (as well as the removal) of the M&E Agency in each State to be made by or with the approval of the Ombudsman; make it obligatory for the R&R Sub-group and the NCA to give full consideration to the reports of the M&E Agencies and take appropriate action; and
- (ix) make copies of the periodical reports of the M&E agencies, the minutes and reports of the R&R and Environment Sub-groups, and the NCA/SSCAC/Review Committee agenda notes and minutes available on request to the NGOs concerned.

(4.10.5) In addition to the above, we must also point out that while the NCA has been vested with responsibilities in relation to R&R by virtue of the Tribunal's Orders and these have been expanded to encompass environmental aspects, as well when the NCA was reconstituted following the grant of conditional clearance to the Project in 1987, the overseeing of the actual construction of the project is within the purview of the Sardar Sarovar Construction Advisory Committee which is also a creature of the Tribunal's Award. We have recommended above that the observations and the recommendations of the Environment and R&R Sub-groups which are Sub-groups of NCA, should be binding on the SSCAC. We feel that it is also necessary to redefine the relationship between the NCA and the SSCAC so as to provide for a unified command structure. We recommend that:

- i) the NCA as the apex body should be able to ensure that every other agency charged with responsibilities in different operational aspects of the SSP fulfills the requirements stipulated for R&R;
- ii) the NCA should have the full authority to monitor closely the progress of work on the dam and on the R&R front and authorise or stop any operation as it may deem necessary for ensuring the discharge of the responsibilities devolving on it; and
- iii) the progress of work on the dam at every stage and for any height should be subject to the fulfillment of the R&R requirements stipulated by, the NWDT with such additions and modifications as might have been made with the approval of the appropriate authority.

(4.10.6) Both in the interests of the affected people and in the interest of the project, we recommend that all the arrangements that we have suggested for a strengthening of the R&R effort should be in place and operational within a period of three months.

V. ENVIRONMENT

(5.1) The issues referred to us include 'environment'. We have considered the matter in the light of the material submitted to us and find that the subject is by and large adequately covered in the observations and recommendations contained in Chapter IV of our earlier Report. Some supplementary observations and recommendations have also been made in paragraph 4.10.4 and 4.10.5 of the present Report.

(5.2) There are, however, two aspects not covered in our earlier Report to which we would like to draw attention. The first is archaeological conservation and the protection of historical monuments and of places of religious importance. We are sure that these aspects are being taken care of by the Environment Sub-group of the NCA and by the Ministry of Environment & Forests, as also by the appropriate archaeological and other authorities, Central and State.

(5.3) The second relates to the question of seismicity. We are aware that this aspect was gone into by the Project planners and that the project incorporates certain measures in this regard. However, following the recent Latur earthquake in Maharashtra, long established ideas on the incidence and areas of seismic activity appear to be undergoing a change. The more recent earthquake in Kobe in Japan also appears to have generated a debate among experts throughout the world in regard to protective measures. We have no doubt that the project authorities including the Dam Safety Panel are seized of these matters and are considering what protective steps, if any, are needed in the SSP.

VI. OTHER ISSUES

The material submitted to us by the NBA raises several larger issues. The different Members of this Group have their individual views on those issues but the Group as a whole has not gone into these matters because it was felt that we should confine ourselves in this Report to the specific issues referred to us by the Supreme Court.

(Ramaswamy R. Iyer)

(Prof. V.C. Kulandaiswamy)

(L.C. Jain)

(Dr. Vasant Gowariker)

New Delhi, 16 April 1995

A NOTE BY RAMASWAMY R. IYER

This is not a note of dissent. I am a signatory to the Report and fully concur in the recommendations. However, I find it necessary to make some further observations. This is a personal statement. My esteemed colleagues on this Group may disagree sharply with what I am going to say; they may also feel that I am overstepping the terms of reference given to us by the Supreme Court. Nevertheless, I find myself compelled to write this note.

2. There are two main directions in which I would like to go beyond the Report. The first is regarding the overall assessment of the R&R situation; the second is in relation to some of the larger issues raised in the submissions.

3. Towards the end of the chapter on the height of the dam, two possible views are postulated: (i) that the R&R problems are manageable with some changes and improvements, and (ii) that the R&R problems have become very difficult to manage and that ways and means of reducing the magnitude of the problem should be explored. Having posed this either/or, the chapter says that the magnitude and manageability of the R&R problem would be discussed in the next chapter. Unfortunately this is not followed up in the next chapter. That chapter provides extensive material regarding the magnitude and complexity of the R&R task, the problems encountered, the comments of various groups, committees and agencies, and so on; gives an overall assessment which does recognise difficulties; and then proceeds to make a number of recommendations. The inference that may be drawn from this is that the Group has implicitly adopted the first of the two views posed in the earlier chapter; in other words, that the Group has come to the conclusion that R&R problem is a manageable one and that with the recommendations made the situation will improve greatly. The alternative view that the problem is tending to become unmanageable, and that it might be necessary to consider reducing the magnitude of the problem is not explicitly referred to; but by implication it stands rejected. I have no reservations whatsoever on the recommendations made in the R&R chapter and I do believe that they will have a beneficial effect if implemented swiftly. However, I also believe that the R&R dimensions of the SSP have become far larger and more difficult than the chapter on R&R indicates.

4. It is clear from the table giving progress with reference to annual and quarterly targets which follows paragraph 4.7.2 that there were considerable shortfalls in 1993-94, and further that the pace of R&R work was slowing down from quarter to quarter in that year. It is understood that the targets for R&R work were based on the anticipation of the dam reaching the height of EL 110 m whereas it has reached only EL 80 m so far. It is possible to argue that having regard to the height reached the shortfalls with reference to the R&R targets do not matter very much; but this would be a circular argument. It is precisely because R&R work was not making satisfactory progress that the height of the dam could not be raised to the planned level; this cannot then be made the ground for excusing the shortfall in R&R.

5. Turning to the quality of R&R, it appears that while perhaps the Gujarat PAPs are being reasonably well settled by the Gujarat Government, there are all kinds of problems and difficulties relating to the PAPs of Maharashtra and Madhya Pradesh, whether they are to be resettled in their own States or in Gujarat. If the PAPs of Madhya Pradesh were given a totally free choice as to where to settle and large numbers choose to settle in Madhya Pradesh, it is not at all clear where the Madhya Pradesh Government will resettle them. Nor is it clear beyond doubt that the availability of land even in Gujarat will present no problems, as the numbers of PAPs increase steeply in the coming years.

6. It is also evident that there are problems in Akrani and Taloda in Maharashtra; these are referred to in the Reports of the Tata Institute of Social Sciences. The Gawit-Pandit Committee set up by the Maharashtra Government also refers to some problems. The Maharashtra Government have rejected the Reports of the TISS; and have stated that most of the problems mentioned by the Gawit-Pandit Committee have already been taken care of. There is hardly any point in appointing an independent M&E Agency and then rejecting everything that that agency says; or in setting up a Committee and then virtually implying that the problems that it refers to do not exist. As regards Manibeli, there are widely divergent accounts as to what happened there, but even the World Bank has referred to the use of force to reduce resistance in Manibeli. It would also appear that though the Governments in their submissions have denied that any problems have been created by the processes of catchment area treatment or compensatory afforestation, there are indeed some problems as the areas in question are not totally uninhabited, and these activities do impinge on existing populations.

7. As regards the resettlement of Madhya Pradesh and Maharashtra PAPs in Gujarat, there appear to be instances of both success and failure. There are many complaints about the quality of land, lack of irrigation, uncomfortable tin-shed accommodation, lack of grazing facilities, and so on. As mentioned in the Report some of

these may be easily remediable and others may be more difficult; but that problems exist cannot be denied. Nor can it be denied that some families, whatever their number and whatever the reasons, have returned to their original States. The Report of the Committee of MLAs under the Chairmanship of Shri Singh Deo makes disturbing reading. One has also to take note of the cautionary remarks of the Madhya Pradesh and Gujarat M&E agencies.

8. My purpose in referring to these problems and difficulties is not to blame the authorities or to belittle their efforts, but merely to make the point that the SSP has in fact run into considerable difficulties on the R&R front. This is the impression that I get from a reading of all the material that has been made available to us. Even partially favourable reports such as the World Bank's Project Completion Report of September 1994 do convey this impression. It is also evident that even as yet the full magnitude of the R&R task is not clear. The total number of submergence-affected people is still not final (as even the World Bank notes); and there is not yet adequate information on the numbers involved in other categories of affected people such as the canal-affected people and so on. We do not so far have a proper assessment of the impact of the project on the areas downstream of the dam, right down to the estuary. The Government's submissions say that these impacts will take some years to emerge and that it is premature to try to assess them at this stage; but that seems to me a dangerously complacent attitude. (A precisely similar attitude prevailed some years ago in relation to the full assessment of the submergence-affected people). It is impossible to ignore the fact that there is much popular discontent and resistance. Even if this is attributed to the, NBA's campaign, it has to be recognised (as pointed out in the Report) that their call must have found some response in the people because of their genuine difficulties and grievances.

9. There is no doubt that in response to emerging difficulties, the Governments have tried to improve and refine the policies and measures, partly on their own, and partly as a result of the efforts of NGOs, as also the World Bank. However, such responses are often both reluctant and belated. Faced with a problem, the first tendency of the administration is to say that it does not exist; after some time (which can mean some years) the problem is admitted; and after further delay some kind of a solution is found. In general, it would be true to say that the administration is always several steps behind the emerging problems and difficulties. To use management jargon, administrative action is generally reactive and not proactive.

10. The fact that R&R work is proving more and more difficult and intractable is shown by the manner in which the Governments are trying to simplify their task through expedient solutions. This has been referred to in paragraph 4.9.3 of the Report. While we can understand the efforts of an overburdened administration to make things easy for itself, we have to note that what makes things easy for the administration may make things very difficult indeed for the affected people.

11. So far the numbers that the R&R authorities have had to handle is around 7000, and this has been spread over the last four or five years. If the Governments have run into such problems in dealing with this number, I find it very difficult to be confident that the machinery will be able to handle successfully and humanely the much larger numbers (upwards of 30000 Project Affected Families or almost 100,000 people) which will need to be dealt with in 1997-98. If the authorities push ahead with the implementation of the project, this will inevitably lead to "compulsory rehabilitation" and the use of force. However, that will have its own repercussions and will make the implementation of the project even more difficult. It is against this background that I feel that it is necessary now to take stock of the situation and consider whether this problem can be reduced to a more manageable size.

12. Such a review necessarily implies that pending its completion and the taking of appropriate decisions, there should be no addition to displacement. I recognise that a pause in the implementation of the Project even for a few months at this stage could have legal and financial implications and entail compensatory payments to the contractors in terms of the provisions of the various contracts; there is also a risk of offers expiring, costs escalating, and so on. However, in my view, these problems will have to be faced in the interest of ensuring justice to the affected people and minimising their distress. The R&R provisions of the NWD Award, the Court decisions, the R&R policies of the Governments and the commitments made in the World Bank loan, not merely form a legal framework as mentioned in the Report, but also constitute a kind of social contract with the people. I feel that the obligations of the Governments under this social contract are as important as their obligations towards contractors under the various construction contracts.

13. It is also necessary for the State and Central Governments to review the financing aspects. This is not one of the issues referred to the Group by the Supreme Court, and so the Report refrains from going into the details of this aspect, but it is evident that the old sanctioned estimate of the project is no longer valid and that the revised cost estimates will be very much higher. Finding resources of the magnitude involved will not be an easy task. The

prescribed procedure of a fresh examination and sanction where the revised cost estimates exceed the sanctioned cost estimates by over 20% needs to be gone through without delay so that these aspects can be gone into as fully as possible.

14. In any such re-examination, it seems to me that it would make no sense to limit the enquiry to one possibility, namely, an FRL of 436'. If a reduction of 19' would mean a significant reduction in submergence and displacement, further reductions in the height of the dam would clearly mean corresponding further reductions in adverse impacts. The M.P. Government had indicated a number of different possibilities (422', 400' and 384'). A series of cases can be worked out with a proper appraisal of each.

15. That brings me to the question of "alternatives" and "radical restructuring". I am not referring to the big dam controversy or the question of 'alternative paths to development'. Those are difficult and complex questions which can be usefully discussed when taking new decisions or planning new projects. Entering into a general debate of that kind in the context of a project which is already under construction does not seem a very fruitful exercise. We have to see what we can get out of the investments already made and the structures created. It follows that when we talk about "alternatives" in this context we can only mean such alternatives as are available under the given circumstances, making use of what has already been done, and not alternatives to large projects in a general and hypothetical sense.

16. Such an examination would include a consideration of the possibilities outlined by Dr. A. Vaidyanathan, Shri V.B. Eswaran and Shri K.R. Datye, all of which envisage the use of the facilities already created. It will also be necessary to examine the ideas put forward by Dr. A.K.N. Reddy and Shri Girish Sant. All these were annexed to our earlier Report. The "alternative restructuring" outlined in the paper by Suhas Paranjpe and K.J. Joy which has been appended to the NBA's submission dated 29 January 1995 will also need to be looked at. I am not endorsing any of the possibilities referred to above. All these will require careful study and appraisal, and some of them may be found to be unviable or even unworkable. It is possible that a detailed examination of these proposals may even result in a return to the project in its present form as the best option. However, it is necessary to explore all possibilities of optimising benefits and minimising pain, pain being defined to include distress to human beings, livestock and wild life, and adverse environmental impacts.

17. Finally, though this Group is concerned only with the Sardar Sarovar Project (SSP), it would not be out of place to utter a word of caution regarding the Narmada Sagar Project (NSP) of Madhya Pradesh. If the Madhya Pradesh Government is full of doubts and apprehensions about the manageability of the R&R task in relation to SSP, they would need to consider very carefully how they are going to handle that task in relation to the NSP, where it is understood that the displacement would be three times as large. It seems clear to me that a thorough review of the NSP is called for at this stage, rather than after the problems have arisen.

18. There is no conflict between what I have said in this note and the idea of phased construction recommended in Chapter III of the Report. A thorough review of the R&R problem implies a pause, perhaps for three or four months. In fact even the implementation of the recommendations will require time: the Report has stipulated three months. During this period the possibilities put forward by Datye Paranjpe/Joy, etc., can be quickly examined. If they can in fact realise SSP's objectives (irrigation, drinking water, taking water to Saurashtra and Kutch etc.) at lower cost and without causing large scale displacement, it may not be necessary to proceed beyond the particular FRL needed for the purpose. In the light of that examination, if it is found necessary to go upto 400' or beyond, this can be done in a phased manner as recommended in the Report.

(Ramaswamy R. Iyer)
16th April, 1995

**DR. VASANT GOWARIKER'S BRIEF COMMENT ON
SHRI RAMASWAMY R. IYER'S NOTE**

I dissociate myself from the individual note that a learned colleague Shri Ramaswamy R. Iyer thought it necessary to produce and append on the last day as the otherwise agreed draft was ready for signature. The issues raised in that individual note (like the alternative) are totally outside the terms of reference stipulated by the Hon'ble Supreme Court to the FMG, and hence my first impulse was not to be a party to a report that contains this individual note.

But my not signing the report doesn't help the Hon'ble Supreme Court on the issues raised to us for our views. I have, therefore, decided to sign the main report agreed to by all the members. I have well considered views on some of these issues and these views are reflected elsewhere in the report. I would, however, like to take this opportunity to add along with this E.G. Verghese's book "Winning the Future" which largely reflects my views on Narmada.

(Dr. Vasant Gowariker)

NOTE BY PROF. V. C. KULANDAISWAMY AND DR. VASANT GOWARIKER

1. We start this note with an explanation and an apology. We realise that the Hon'ble Supreme Court has given the FMG the limited and well defined task of giving our views on three aspects, namely

- i. Hydrology
- ii. Height of the Dam and
- iii. Resettlement & Rehabilitation of oustees including environment

in the case of SSP. It is clear to us that such topics as i. Alternatives, ii. Restructuring of the Project, iii. Stoppage of the work to review the R&R status and to use the occasion to study other possible proposals and the iv. Capacity of the State of Gujarat to finance it, are in our opinion without a trace of doubt, outside our purview. Discussing them here may even give an impression that we tend to use this medium to air our views on certain issues that are now subjects of public debate on the philosophy of development itself but not germane to the issues referred to us by the Supreme Court. The report from page 1 to page 125 was finalised and agreed upon on 13.4.1995 and we were to meet to sign the fair copy on 16.4.1995. As we assembled on 16.4.1995, we found that one of the members came up with a note dealing with topics that we considered outside our terms of reference and also partly contradicting and negating what has been stated in the main report as the agreed assessment and recommendation of all the members. We tried to avoid having to do it: but did not-succeed.

2. We have assembled to sign an agreed draft; but find a situation not in our scheme of things. There is hardly any time within half a day to touch upon a number of topics discussed in a note and presented to us as a fait accompli. It is also not possible, nor is it desirable to delay the signing of the report. We decided to add this brief note under an extreme handicap of absolutely short notice besides the unexpected problem that faced us. We entertain the hope that these issues will be held outside the purview of this Group. We add a brief note, though reluctantly, giving our immediate reaction. Our apologies for bringing in, what, in our opinion, need not have been brought in. We hope the Hon'ble Supreme Court will be kind enough to appreciate the compulsion and the constraint of time under which we write this note.

3. Alternatives: the advocacy of alternatives to large dams and debate over large dams is nothing "new." Today it forms part of a new philosophy of approach to development itself. The subject has been a theme of national and international seminars. In water resources planning and development suggestions concerning rainwater harvesting, conservation of water, construction of minor irrigation works, recharge of ground water and conjunctive use of surface water and ground water have been recognised and adopted. These measures are necessary and are to be practiced as widely as possible. Irrigation practices with canal irrigation in India date back to the beginning of the Christian era: the Grand Anicut across Cauvery, perhaps the oldest irrigation structure in the world still in use, belongs to the 2nd century A.D. and Tamil Nadu has over 39,000 irrigation tanks. We now see the application of modern technology for minor irrigation practices and for water resources utilisation. In the Indian conditions, as per considered opinion of the technical experts who are capable of taking a comprehensive view of the matter, these are necessary and complementary to large storage work since canal irrigation system also has its own limitations of coverage. But given the facts that the entire precipitation which is the only source of water is concentrated in a matter of about three months in a year, storing extremely large quantities of water that become available in short periods of time and flow in unmanageable floods to the sea and making them available for over three fourths of the year are inescapable in Indian conditions. The extremely lopsided temporal variation is not the only problem; we have, perhaps in an equally acute form a lopsided spatial variation with devastating floods, loss of life and property in one part of the country and severe drought and conditions bordering on famine in another part, both occurring at the same time. The problem we face is not only storage for distribution over time, but also for distribution over space. The future may have in its womb, developments that may make a break through in water use and food production and bring about changes not comprehended and visualised by us today. In the existing and foreseeable state of science and technology, India with its present and steeply growing needs at one end and lopsided distribution of water resources in space and time at the other, has no other alternatives to large scale storage and distribution within a given basin today and long distance transportation across the basins tomorrow. We have to accept this inevitable prospect and reality and find acceptable solutions to attendant problems that follow in the wake of such developments. However, all debates on alternatives could be for future planning and development: its relevance to SSP, which is fast nearing 50% stage of completion, is not easily conceivable.

4. Restructuring: Any suggestion of restructuring in the context of SSP and in its present shape of progress can only be taken to be euphemism for abandoning the project as conceived and designed. We do not want to list here the items of work completed, as well as those tendered and contracted. The progress at the main dam, canal works, gates and powerhouse units will lend themselves to no significant restructuring. The possibility of reduction in height and its implications and that too with two alternatives +436' and +455' have been discussed in the main report and our recommendations have been given. Any other aspect of restructuring is not in the domain of reasonable possibility at the present stage if one wants to see SSP completed substantially, as conceived, designed and being constructed. We would only refer to the letter from the present Chief Minister of M.P. to the Prime Minister of India dated 1.3.94 wherein he has stated that, with the reduction of the height of dam to 436', he has expressed, confidence of enlisting the co-operation of NGOs to meet the problems that arise in R&R operation. We are unable to comprehend any meaningful approach to restructuring at this stage other than the alternatives we have discussed in the main report.

5. Gujarat's Capacity for Financing the Dam: We do not feel competent to go into this issue either in terms of our knowledge of the subject or the information available at our disposal.

6. R&R and its Magnitude: An approach to R&R with a concern for the persons and families who are to be displaced and for ensuring their satisfactory resettlement is one aspect: but looking at it as source of argument for stopping the work, examination of scope for restructuring, and considering alternatives is totally a different aspect.

In Chapter IV of this report, we have considered the R&R issue at length, analysed the problem in all its aspects and given a unanimous assessment of the task and our recommendations for successfully meeting the challenge that R&R operations pose. We fail to understand the rationale of opening the issue again in a separate note.

We may state that the FMG has listened at the time of preparing the first report to a detailed and comprehensive presentation by the members of the NBA, of the magnitude of the problem, the hardships encountered and being suffered by the PAPs and the indifference or inefficiency of the authorities in charge of the R&R operations. We also listened to a few representatives of PAPs in a few sessions. They presented with great concern and anguish an exhaustive and graphical picture of the R&R scenario. The Members of the FMG gave due and deep consideration to the issues to the best of their capacity. It was for us a choice between the hardships to be faced by two groups of the members of the public i.e., the PAPs numbering over 41,000 odd families on one side and the people to be benefited who may be over 30 million on the other. The problems of life are problems of choice. Giving anxious thought to all aspects, we concluded that:

“The statement that rehabilitation is impossible is a counsel of despair which cannot be accepted. It is no doubt an enormously difficult task but it cannot be treated as impossible on that account.”

We have before us the documents presented by the Government of India, the State Governments and the NBA. In terms of the hardships encountered by the PAPs, the problems they face in the new environment, the social consequences and emotional problems, the NBA's presentation earlier still remains the most effective and comprehensive. Giving necessary consideration to all relevant aspects and considering the choices available, we come to feel that the conclusion reached by the FMG in its earlier Report, when R&R was the only major issue and was debated at length, still holds good. Our thoughts and efforts have to be addressed to R&R operations that demonstrate concern, compassion and realisation of and respect for the rights of the PAPs and in general, ensuring a humane approach in every way and efficient implementation of policies.

It is needless to say that we recognise fully that human beings are not chattels to be transported from place to place at will, even if the 'will' be that of the mighty government. Displacement by way of uprooting people from places and surroundings, when it is not of their own choice and for their own benefit, is an unhappy experience for any one to undergo and an unpleasant task for any one to undertake. The emotional stress could perhaps be understood fully only by those who experience it; the best of our intentions and the most fertile of our imagination may not fully comprehend their emotions, keeping the economic aspects apart. Granting all this, we have to recognise the basic fact that displacement and rehabilitation of people is part of most of the major developmental projects - the river valley projects being important ones among them - while the numbers and distances may differ. Having accepted this as part of the developmental process, not only in this country, but all over the world, what is expected of the parties concerned is to ensure that the few who are displaced, not necessarily for their own benefit, but for the benefit of others who are many, are compensated adequately and their needs are looked at not from procedural or legal point of view but, with human considerations and sympathy and as people who have made some sacrifice for the sake of' larger interests. Whatever public relations measures that; are possible must be brought to play in the long process of moving them from where they are to where they are resettled and rehabilitated;

resettlement may be a physical process but rehabilitation is something more; it takes time and neither law nor administrative measures can achieve it. Our expectations and demands naturally have to take into account these limitations; resettlement is a compensation; is relocation; it can never be a “restoration”; it could also be that in some or many cases the relocation is better than restoration; an instance is the continuous migration - no doubt voluntary - of millions from villages to urban centres near or far as the case may be.

With the above preamble, we may take a look at the R&R scenario of the SSP. The issue as such has been discussed in the main report. We are here concerned with the manageability of the R&R task and record our view on such suggestions as stoppage of work, restructuring and considering alternatives stating that R&R of SSP is unmanageable. The points that need consideration are:

- i) whether a satisfactory R&R package is provided to various categories of PAPs and procedures have been established for displacement, resettlement and rehabilitation.
- ii) whether a suitable network of organisations [...] for implementation as well as for assessment [...] monitoring the performance with regard to [...] and time frame
- iii) whether the components of the machinery set up with appropriate responsibilities for R&R operations perform their tasks satisfactorily.

It has been pointed out in the report that the R&R package of SSP marks a significant improvement over any that has been earlier offered in this country in any project. Even the World Bank which has been critical of the R&R operations and other aspects of SSP has observed that

“In 1987-88, Gujarat developed a policy for its villagers affected by the Sardar Sarovar Project (SSP) that has since been welcomed as among the most progressive package of measures ever devised for securing the long term rehabilitation of people by large scale development projects.”

It is conceded unreservedly that besides the enlightened approach of the Governments concerned, the NGOs have played a significant part in this regard.

As regards the operational procedures for effecting the displacement and resettlement, NWDT has laid down clear guidelines in all details which we have already referred to.

Considering the machinery for implementation, it is known that a network consisting of:

- i. NCA
- ii. R&R Sub-group
- iii. SSCAC
- iv. M&E Agencies and cooperating
- v. NGO organisations

have been set up with adequate powers where necessary for performing their tasks. As a further step of ensuring satisfactory performance, report is sent to the Supreme Court from time to time. In the case of Gujarat, a Committee named as “Sardar Sarovar Punarvasavat Agency” functions directly under the Chief Minister and Gujarat has also established a committee known as “Land Purchase Committee” for acquiring lands by private negotiations. Prima facie the set up is adequate, but what needs to be assessed is its effectiveness.

We come to the question of implementation of the R&R package and R&R policies by the machinery set up for this purpose. The assessment has to be made, based on the reports we have from different agencies. They are

- i. Reports of R&R Sub-group
- ii. Reports of the State Governments
- iii. Reports of M&E agencies
- iv. Reports of NBA

v. Reports of Members of Legislature from the M.P. assembly and Members of Parliament from Maharashtra.

One of the important aspects for consideration is whether the resettlement is done in time before the areas where the PAPs live are submerged and whether a linkage exists between the progress of work and the dam and advance displacement and resettlement of the PAPs. The answer is that it exists and the question is how effective it is in ensuring the synchro-nisation. We quote below, three events which may be a repetition of what has been stated in the main report. It is done intentionally for continuity in the present narration.

EXAMPLE-1:

Extracts from the Report of Comptroller and Auditor General (A/c) of Gujarat dated 31 May, 1992:

“A revised construction programme for these works was therefore approved in December, 1989 by the SSCAC. The company (SSNNL) requested the agency contractors for advancement of the approved construction schedule . . . the proposal for the advancement of the target was not accepted by the SSCAC, who recommended that the Government should adhere to the Revised Implementation Schedule (RIS) approved by them in December, 1989 the company indicated to the Government that the entire expenditure on these proposals were to be borne by the Government. Accordingly, Government gave their consent to these proposals in January, 1991 and sanctioned while the company went ahead with the construction of the work as per the revised time schedules, the SSCAC directed the company in December, 1991 to restrict the placement of cement on the dam due to reservation expressed by the Maharashtra and Madhya Pradesh Governments regarding their ability to take up the additional load of rehabilitation **THUS THE DECISION OF THE COMPANY TO SPEED-UP THE CONSTRUCTION OF DAM AT CONSIDERABLE COST WITHOUT DUE CONSIDERATION OF THE ABILITY OF THE PARTICIPATING STATES TO SPEED-UP THE REHABILITATION WORK AND WITHOUT SYNCHRONISING THE PROGRESS OF THE CANAL AND SUBSIDIARY WORKS WAS UNWISE AND RESULTED IN SUBSTANTIAL EXPENDITURE.**”

However, the work was not allowed to proceed.

EXAMPLE-2:

On the construction year 1993-94, the minimum block level of the dam, though sanctioned only upto EL 67 m, the project authorities went ahead upto EL 69 m without sanction. This is recorded in the Minutes of 50th Meeting of SSCAC held on 21.1.94, “Chairman wanted the likely problems of R&R linked with the closure of sluices to be discussed at this stage when the dam had been raised within minimum block level at 69 m though SSCAC had decided to keep this at EL 67 m.

EXAMPLE – 3:

In the construction year 1994-95, 3 blocks were raised to levels higher than what was approved by SSCAC. The Minutes of 56th Meeting of SSCAC held on 1.12.1994 recorded this: “A statement indicating the construction levels of the dam blocks achieved upto 30.11.1994 vis-a-vis the progress till June, 1994 as circulated by the GOG alongwith L-Section of the dam profile indicates that in 3 blocks - 2 auxiliary spillway blocks and one composite block, the dam height had been raised by 1 m and 2 m respectively above the levels approved by the SSCAC in the previous meetings. Madhya Pradesh expressed serious concern at this lapse on the part of the GOG and suggested that such deviations should not be allowed to occur at all.

The Committee after detailed discussions decided, as under:

SSNNL shall strictly adhere to construction schedule approved and ensure that dam height as approved by the SSCAC from time to time is not exceeded at any stage in future.

One may quote these instances to show that there have been violations of the approved phasing of resettlement and submergence. One may also quote the same instances to show the efficiency or effectiveness of ensuring linkage between raising dam height and resettlement and the concerned authorities moving in to stop construction work when found warranted and admonishing when violations even of a minor nature are noted.

Both the approaches may have some justification; but one cannot but note that there is a mechanism, a reasonably alert one, to oversee the linkage. It can be seen that in the first case the construction has not been

allowed though contracted; in the third case the SSNNL has been pulled up for exceeding the approved height between 1 m and 2 m, not in the dam as a whole, but in 3 blocks out of 64 blocks which by itself will have no adverse effect on submergence.

As per the revised implementation schedule of 1989, the dam is to be completed upto EL 110 m by June 1995. But taking into consideration the slippages in R&R the SSCAC has so far allowed the construction to proceed only upto 80.3 m. We have reason to conclude, therefore, that there is an effective system of linkage between the progress of work at the dam site and performance in R&R operations and there is a genuine effort on the part of the system to abide by the stipulated conditions in operation. Of the lapses in control, the case of increase in dam height by 2.0 m warrants attention; information on the consequent flooding if any and hardship caused to inhabitants is not available in the pages of reports we read through; it is a lapse, but a single instance must be given the importance that is due - neither ignored nor overstated.

We would like to record here also that the part played by NGOs assisting the PAPs would have had its influence on the alertness of the concerned committees.

As regards the resettlement; itself we have discussed it at length in the main report and given our unanimous assessment and recommendations. Really any further discussion is not warranted in this report on the very same subject. We shall be brief. We do not contribute to the thesis that all Government established Committees lack credibility and their assessment is not to be taken seriously. There are evidences to show from the reports of R&R groups that they have pointed out lapses and deficiencies in the resettlement accomplished. We do not also believe that they would submit the periodic reports to the Supreme Court without being sure of their being factually correct. We also concede certain limitations from which a body consisting mainly of Government officers may suffer. We have taken note of this in our main report.

We have assessed carefully the progress made in data collection, identification of the submergence of land area and its categories, the number of villages as well as houses and huts affected, the number of families and persons involved. We have taken note of the fact that resettlement of PAPs in Gujarat in Gujarat itself and PAPs in Maharashtra in Maharashtra itself have not presented major problems. The main task is one of PAPs from Maharashtra and M.P. to be settled in Gujarat. In so saying, we have not ignored the difficulties met with in the latter cases also. We have considered carefully the accounts given by Gujarat, the Government of India and the replies of Maharashtra, to some of the criticisms on R&R and the letter of the Chief Minister of M.P. to the Prime Minister. We have made a detailed study of the observations on R&R in the Project Completion Report of the World Bank which has been the severest critic of SSP especially concerning R&R. Its final report can be interpreted to be reasonably optimistic. The following observation of the Bank deserves to be noted. Discussing i) baseline information, ii) specific policies covering the different category of PAPs, iii) institutional arrangements, and iv) monitoring arrangements, the Bank observes:

“However, while all these criticisms are largely valid, it is also true that in all four of these areas enormous strides were made during the early years of the project to the extent that the R&R undertaken to date is better than of any R&R undertaken in India. Indeed, the R&R work done in Gujarat has been used as a model for such work in other areas.”

We feel that there is no room for fear of inability of the three major States to manage the R&R problems of 41,000 families and 1,27,000 persons if they arrive at the height as +455' and about 30,000 families and over 90,000 persons if the height is agreed upon as +436'.

The dam has been completed upto +80.3 m and upto this height the authorities have ensured the fulfillment of the requirement that the R&R is completed before the dam is allowed to reach a particular height. We have taken note of the sense in which GOI uses the term 'complete'. Delays there have been and delays there may be in future. That does not demonstrate or prove inability. Taking into account every factor that has relevance and comprehending fully the magnitude as well as the complexity of the task and matching them against all aspects of preparation so far made, we have no reason to subscribe to any thesis of unmanageability of R&R operations. We may conclude by saying that as regards resettlement and rehabilitation, we are of the considered opinion that the conclusion we reached in our first report still holds good.

(Vasant Gowariker)

(V.C. Kulandaiswamy)

L.C. JAIN'S COMMENTS ON SHRI RAMASWAMY R. IYERS NOTE

1. Our esteemed colleague Shri Ramaswamy R. Iyer has put his finger on what are truly the fundamentals of this project on which we have invested high hopes let alone large material resources; and the unprecedented scale of displacement and draft on our environmental resources it entails. The issues he has raised are by no means extraneous to the specifics such as hydrology, height of the dam etc. Indeed they arise as one looks closely at any one important aspect of this project. It is, therefore, not in the best interests of the project itself and certainly not of those whose life it will touch one way or the other, to push these issues under the carpet.
2. With a rare clarity and compassion, Shri Iyer has listed and highlighted the prominent issues and urged their serious consideration in the spirit of what he calls 'explorations for maximising the benefits and minimising the pains'; this is unexceptional, to do the opposite will be a tragedy.
3. He has not included in his note any issue which to the best of my knowledge has not hovered around or haunted our proceedings since we first started in August 1993, nor has he burdened the note with any specific solutions of his own, so we need no time to respond to his note and say that a review of the issues he has listed is pertinent, if not paramount.
4. It must also be said in all fairness that not only were we no strangers to these broader issues, we were also no stranger to Shri Iyer's intention to write a note of the nature and scope he has written. He had mentioned it to us, more than once, but he was pressed to drop the idea. But clearly the pressure of his own feelings, and conviction appeared to have proved stronger. That is to be respected. When we assembled this morning he shared his note with us, with abundance of apologies for not following the advice to drop the matter and for the inconvenience caused to his colleagues. No doubt that this limited the time for others' response to his note, but then we did have a whole day on our hands and some of my esteemed colleagues have, as evident, availed of it and proffered a detailed response with supporting literature. I for one fully endorse a review of all the broader issues listed by Shri Iyer and sooner the better.

(L.C. Jain)

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