A NATIONAL WATER POLICY FOR INDIA

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"People must come to accept private enterprise not as a necessary evil, but as an affirmative good."

—EUGENE BLACK

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By

Dr. K. L. RAO *

Air and water are essential for the existence of man. Man from early times has worshipped air and water. In the famous temples at Chidambaram and Jambukeswaram in the South, air and water symbolise for Lord Siva.

In the modern world, there is a danger of both these getting polluted or otherwise diminished due to the activities of man. There is a danger of the air being polluted by the gases let out by aeroplanes, automobiles and the industries. The regeneration of air is also reduced because of the destruction of trees. Likewise, by indiscriminate use of water and its pollution, usable water is getting reduced while the demands for water are greatly increasing.

Thus, water is becoming a restraint on the future progress of mankind. Scientific world has recognised this and probably the largest number of meetings and discussions are being held on the subject of water in the last few years all over the world. We have this year the World Conference on Water at Delhi in December, a Regional Conference on Water in 1976 and the World Water Conference under the auspices of the United Nations in Argentina in March 1977. It is, therefore, necessary for each nation to pay attention to this problem of water and plan out well in advance to

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use the fixed amount of water available for the nations and to avoid, with the help of technology, water crisis which will arise in the absence of attention to it.

Water resources in India are from the rains, principally of the south-west monsoon and to a minor extent from the north-east monsoon. In the south-west monsoon, the clouds are formed out of the evaporation from the Indian Ocean and move from south-west across India to the north-east. When the clouds reach the western shores of India, the high west coast mountains obstruct and cause the clouds to unload a portion of the precious load. Further on unobstructed they pass across the country to the Bay of Bengal and due to the absence of any high mountains in the east coast, no appreciable rainfall occurs in the eastern region of the country. Most of the water is carried across to Burma, Thailand and other East Asian countries. A branch of the clouds turns from Bay of Bengal to north-west and strike the Himalayas and are responsible for the rainfall in the northern region of India. Cyclones also contribute rain in the east coast of India. The rainfall partly sinks into the ground and mostly runs as surface flow in the rivers. The rivers in India are divisible into three groups, major rivers with a catchment area of 20,000 sq. km. and above,—numbering 14, — medium rivers with a catchment area of 2,000 sq. km. to 20,000 sq. km., numbering 44. There are a large number of minor ones with less than 2,000 sq. km. each. Major and medium rivers contribute 90% of the waters of the river systems in India. The total flow of the rivers is estimated at annual average of 1,645 thousand million cubic meters. Waters that sink into the ground and which can be extracted economically are estimated at 2,55,000 million cum. The total water in India is thus about 1,900 thousand million cum. But all these are not available for use in India. A portion has to be shared with other countries like Nepal and Bangla Desh. The figures given above exclude the waters that we let down as per the agreement with Pakistan. Besides this allocation to other countries, the rivers of the Ganga and the Brahmaputra being very big, we

cannot utilise all the waters fully and a lot of it flows down to the sea in the monsoon months. Also it will not be possible to construct storages completely to hold back the waters. Thus, it is roughly estimated that the usable water will be about half the total waters of India. To utilise even this, we have got to store up at least a third of these waters. At present the stored waters are only 15%.

It is possible that the available water may diminish but, there is also the promise of technology for increasing it. Desalination of sea water, cloud seeding, prevention of evaporation from reservoirs are some of the measures which are at various experimental stages and may be able to augment the waters to certain extent. But at the present stage of our scientific and technological development, it may not be possible to take these into account. A more promising measure by which probably the water can be augmented, particularly in the rabi period, is by melting the Himalayan snows up to higher levels than at present. In the year 1972, the Sutlej water brought far more water than the rainfall indicated when compared to the earlier years. Preliminary investigations showed that the snow melted to a higher level than usual, that is to say, the snows that are gathered in the hill slopes and tops of the Himalayas do not generally melt above a certain level; but if it is done, the flows of the Himalayan rivers will be greatly augmented. This is an aspect which has great potential in India and we should carry out scientific investigations. India has a limited amount of water, all of it is not utilisable and, therefore, extreme care is necessary in its use so as to meet the mounting needs of the nation.

There is one other danger to the usable water due to heavy pollution that is occurring in Europe, where most of the rivers are medium and small. Due to the large number of industries and dense population, sewage and industrial waters, where not treated properly, cause heavy pollution of the rivers resulting in perpetual reduction of the quantum of the available waters. In India, we do not have at present

much trouble from industrial wastes though a number of mistakes have been committed by faulty location of some of the industrial plants like the antibiotics factory at Hardwar, the paper mill at Rajahmundry etc. The effluents pollute the rivers. The main reason, however, of pollution in India is the sewage entering the rivers. Even in these advanced years of the century, gross pollution occurs due to the sewage being let into the Ganga at Banaras where millions of people go for a holy dip every year. The Jamuna at Delhi is no better. The pollution of the water thereby causes the reduction of the available waters. In Europe, particularly in England and other small countries a stage has come when even the sewage has to be treated for re-use. So when we are thinking of the water resources planning, we must ensure that the quality of the waters is not affected by pollution.

Of the various uses to which water is put in India, the most extensive use is in agriculture. The money value of the water used in agriculture is, no doubt, the least of all the possible uses and if strict economic returns are taken into consideration, the use of water in agriculture will prove very uneconomic. But in reality, the most important use of water in India is for irrigation. There is an erroneous propaganda that irrigation causes economic loss and that minor irrigation will be sufficient for India's needs. This only shows that we have not fully realised the importance of irrigation in India. India is a country where rainfall is very uneven, unreliable and is distributed in a very irregular manner all over the country. One-third of the area is completely in arid and semi-arid region. There is no use of comparing the foodgrain production in Japan per hectare with that in India. The average rainfall in Japan is far more than the average rainfall in India. Irrigation is the most basic input. The examples of Madhya Pradesh and Punjab show this very clearly. In Punjab irrigation is nearly 80% while it is 8% in M.P. Though the land sown in Madhya Pradesh is more than four times the land sown in Punjab, the foodgrain production in M.P. is hardly a little more than

that in the Punjab. Again, let us consider the food produced in the largest food producing countries of the world, such as the U.S.A., the U.S.S.R., China and India, where the total food production in the four countries is 60% of the total world production. In the case of the U.S.A., the area under foodgrains is 9% of the total area of the world, but the production is 17%. In the case of India the area on which foodgrains are grown accounts for 16%, but the production is only 9%. This indicates the prevalence of very unfavourable conditions in India. In each of the countries, the U.S.S.R. and China, the production accounts for 16% as also the cultivated area for foodgrains. In the U.S.A. maize is a major crop and in the U.S.S.R. it is wheat. In China and India rice is the major crop. It is also to be noted that fertilisers can assist only to a certain extent. It is seen that in the U.S.S.R., fertiliser is used at the rate of 83 kg. per hectare, but only a third of it is used in China, but the average yield is the same for both the countries. This indicates that a higher response ratio is realised in China on account of the higher percentage of harvested area being irrigated than in the U.S.S.R. Many more statistical facts can be given to show that irrigation is indispensable for foodgrain production. But irrigation in India hardly accounts for 25% of the sown area and even out of this a large part of irrigation has unreliable water sources like small ponds, shallow wells, contour bunding etc. Besides irrigation there are many other uses to which water is put. Water is used for generation of hydro power and for cooling thermal and nuclear stations. Industry also requires significant amounts of water.

For domestic and municipal water supply, we must reserve waters on priority basis. The urban population is increasing and this makes water supply problem in towns more complex. It is interesting to note how the demands of Delhi water supply have gone on increasing. Water supply schemes were proposed for Delhi in 1869 and the construction was completed in 1896. For getting the water 86 wells were excavated by the side of the river. They expected 2

million gallons a day, but only half the quantity was obtained. After Delhi became the capital, the demand has gone on to 190 million gallons per day now. It is expected that at the end of the century, the demand will go up to 1,000 million gallons a day.

India is lacking in navigation facilities. We have paid very little attention to fishing, wild life and recreation. All these require water. Though we may have water sufficient for these needs, they have got to be organised particularly because of the unfavourable location of water. As compared with the industrially advanced countries like the U.S.A. where only 40% of the water is used for irrigation, India has to use twice this amount for irrigation. Thus, the economics of the money value of water is entirely different between the two countries and when we are planning for India, we have to plan on the basis of the prevailing conditions in India.

The main difficulty in India is the erratic availability of water. In the areas north of the tropic of cancer which passes through Bhopal, the water carried in the rivers and underground is only 2/3rds of the total, whereas in the region south of the tropic of cancer, the water is only a third. Even this is contributed to a large extent by medium and minor rivers which cannot be harnessed completely. The water usable in the Southern region is only a quarter of the total water in the country. Obviously the water is inadequate for development in some parts of the country. Even in the regions north of the tropic of cancer, there is a heavy imbalance in the availability of water between north of the Ganga and the south of the Ganga. Also west of Allahabad (82° longitude) water is far less than what is required. In the Ganga system, the flow in the river at Allahabad is much less than what it is after the confluence of the Ghagra, the Gandak, the Son and other tributaries. Again Ganga before the confluence with the Jamuna carries less water than even the Jamuna. The diversion of the waters of the Ganga, for the regions west of the confluence, cannot

be made earlier than Allahabad. Hence the serious hydrological limitations. The availability of water differs in different regions of the country for the purpose of planning the maximum utilisation of the waters in the country. The waters of Brahmaputra cannot be used in appreciable quantities as it flows in a narrow valley hardly 80 km. wide with heavy rainfall. Waters of the Indus are not available for further exploitation in India due to the Indus Waters treaty. Only through an integrated planning and operation of the various river systems in India that even the usable waters can be achieved. In order to secure this we have got to link the various rivers.

There are many examples in the world where water has been diverted from one river to another. In the U.S.A., in the state of California, 5,200 million cum. of water has been transferred from the northern parts of the State to the areas in the south. There have been investigations to bring the waters of the Mississippi by high lift pumping to Texas. In the U.S.S.R. waters from the north flowing rivers are being planned to be taken to some of the areas in the South. At every conference on water, inter-basin transfer of waters is one of the most important subjects discussed. In India, at least we cannot afford to sit idle any longer. We have also done in this country diversion of water from one river to the other in the past. The waters of the Periyar were diverted to the eastern parts of Tamil Nadu. The waters of the Jamuna have been taken to western areas. We diverted the Indus waters into Rajasthan. But all these have not been on any extensive scale. In order to remove the imbalances of the regional water resources and solve the various water conflicts it is necessary to inter-link the various rivers and transfer the surplus flows to areas of deficit supply. One of the most important links that can be done in India is from the Brahmaputra at Dhubri to Farakka by taking a canal flowing partly through Bangla Desh. This will enable some part of the Brahmaputra to be diverted to the Ganga. Similarly, the Ganga waters can be lifted into the Son and from there a canal can be dug from north to the south linking all

the rivers down to Cauvery. This incidentally will provide excellent navigation link from North to the South providing cheap transport and will also enable the central portion of India to be as developed as the coastal regions. This canal will link up most of the important rivers of India and, in any year, the surplus waters flowing in any of these rivers can be made use of to augment the water in the other rivers. A canal can connect the Chambal with the Rajasthan canal crossing over the hump at Nagaur. Thus any number of links are possible and it is high time we started investigations on these. It is only by integration of our river systems that we can hope to utilise at least half of the waters that are available in India. The United Nations Team offered the following comments on India's proposals to link up the rivers: "India's national economy and its development and growth will be confronted with a problem of increasing scarcity of water in the next thirty years. From basic compilation of future water demands and water yields, it becomes evident that in the year 2,000 A.D. or so, the National Water Grid will be a necessity. No time should be lost to start the very difficult and complex investigations today so that plans will mature and are prepared in due time and the facility will become operative when the need would have come."

In order to make full use of the water in the country, we have to take certain steps. The first is the declaration of the National Water Policy. It is very clear that the waters of the country belong to the entire nation and it is necessary to remove the wrong concept that is prevailing now that the waters of the rivers belong to the different States. It is this concept that has led to the large number of conflicts and unpleasant feelings among States. Practically all the other countries of the world have a national water policy. The earlier we do this, the better it is for the country. To implement this national water policy, we should establish a National Water Authority for which the Prime Minister will be the Chairman. The planning and development of the water will be on a national basis, and need-oriented. One of the first tasks that the National Water Authority should

take up is investigation of the national water links. The next important step is to ensure the quality control of the rivers. Though we hold the rivers in reverence, we do not feel any compunction in polluting them. A survey of the quality of the various river systems and the pollution caused should be made to enable a scientific planning for rectification of the pollution. The next step is to bring about international cooperation with neighbouring countries like Nepal, Bangla Desh, Bhutan etc. Ganga and Brahmaputra flow through these various countries, and cooperative efforts are necessary for an integrated planning for all these countries. The Brahmaputra which is now causing huge distress to Assam in India and to Bangla Desh can be controlled if China cooperates. Dams can be constructed in the upper reaches of Brahmaputra to hold back the waters of the main stem. Incidentally, China can get greatly benefited from the production of cheap hydro power. Thus, in the interest of development it is necessary to investigate together how to control the Brahmaputra so that the river may be of use to the concerned countries. Similarly, the floods in the eastern part of U.P. are entirely due to the Ghagra river which is bigger than Ganga at Allahabad. The Ghagra brings a huge amount of water from Nepal. Uncontrolled it causes havoc in U.P. and year after year it is damaging life and property causing huge loss. The eastern U.P. is extremely fertile, but it is poor because of the annual occurrence of floods in the Ghagra and the Rapti. This can be remedied only if the Ghagra and the Rapti are controlled which is possible by construction of dams in the territory of Nepal. It is high time that we should seriously take up with the Government of Nepal the construction of dams for control of the rivers for the benefit of both the countries.

The increased costs of irrigation projects is another difficulty that has cropped up. Some 25 years ago, the cost was hardly Rs. 300 to Rs. 400 for securing irrigation benefits to an acre of land. Now it is as much as Rs. 1,500 to Rs. 2,000. At these high costs, it is impossible to achieve accelerated programme for irrigation which is necessary for

the nation's needs. We have, therefore, got to take steps to secure economy. The engineers have got to play their part in evolving cheap designs specially for the canal systems. For the construction we have to introduce national service, which may be called Bhagirath Service. The people must feel proud to participate in these services. Everybody must take up some portion of the work and at much less costs than at present. We should evolve new techniques wherever possible. For example, we should use system analysis, and computer studies to decide the best choice of various alternatives. New techniques must be pressed into service. Radars can be used with greater efficiency to measure the rainfall instead of rain gauges. Survey of flooded areas can be done with great accuracy and in shorter time with aerial photographs than land surveys.

Post-valuation of the projects could be another important step. We should set up bodies of experts with unbiased minds to go into the various projects and assess and suggest as to how best to get the benefits out of these projects and lessons to be drawn from them. This should serve to put planning on correct footing and make available the precious water of India for all and in good time.

The views expressed in this booklet are not necessarily the views of the Forum of Free Enterprise.

"Free Enterprise was born with man and shall survive as long as man survives."

—A. D. SHROFF
(1899-1965)
Founder-President,
Forum of Free Enterprise.

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