CHAPTER V

Issues and problems of Kaiga Project: An Elitist Perception

The concern expressed by the elites including local elites was very effective in terms of promoting awareness among the common people about issues and problems of Kaiga project. Elites are better educated and informed about issues and problems of the project. As guardians of public interests, they play a very crucial role in mobilizing people against Kaiga project. In view of this, it is very pertinent to study elites perception of various dimensions of Kaiga project. A number of elites have expressed their concern on Kaiga Project. In this respect, we donot cover a specific type of elites. The elites that we have covered belong to various fields like literature, science, technology, economics, social service etc,. Elites have expressed their concern on the project with reference to the following issues:

1. Selection of site for the project
2. Nuclear power exploration and know how
3. Alternative sources of energy
4. Financial burden
5. Secrecy of documents
6. Kaiga project and Kadra Dam
Shivaram Karanth's views on Kaiga.

Shivaram Karanth, who belongs to Kaiga region is one of the most important, honoured, and prominent elite and environmentalist who opposes the establishment of Kaiga nuclear plant. He has expressed his great concern on the issues and problems of Kaiga project. His concern appears to have helped to educate the people about the hazardous effects of Kaiga and mobilized people against the Kaiga project. It is thus very appropriate here to know the views of Shivarama Karanth on the Kaiga project.

Some people live years, other in deeds. At 93, Kota Shivarama Karanth has done both. Journalist, litterateur, dramatist, playwright, photographer, environmentalist, householder, - he is all these and more. The winner of the prestigious Jnanapith award in 1978 for his novel, "Mookajjiya Kanasugalu", he has received umpteen honours and tributes, but had the moral courage to return the Padma Bhushan, which was awarded to him in 1968, in protest against the emergency imposed in 1975.¹

Shivaram Karanth was born in a small village called Kota, near Mangalore on West Coast of Karnataka. He grew up on the lap of nature, in a region that is really beautiful. When the monsoons bring clouds to the sky and add to the green of the earth, it becomes a veritable paradise. This inculcated in him a love of nature and he considered nature as a temple. He says, the peace he finds in a river, in a hill and in the sky, he won't find in places of worship.
In 1921, when he was 19, he left his studies to join the non-cooperation movement. From his very childhood, he followed developments in science and technology and their impact on the daily lives of ordinary people.

He has been campaigning extensively against the Kaiga nuclear plant and the destruction of forests. Shivarama Karanth does not oppose development but does not agree that development needs the mindless destruction of resources that is going on today. In spite of his ripe age, he has been quite active on environmental causes.

A century ago Kaiga, the tropical rain forest on the lower slopes of the western Ghats, had been declared a reserve forest. Today, this fact has been totally ignored and the area lies in grave peril with the Department of Atomic Energy's proposal to site two nuclear reactors there. Local inhabitants and environmentalists have now been joined in their protest against the project by Karnataka's Jnanapeeth Award-winning writer, Kota Shivaram Karanth, who is an erudite scholar, a playwright and a man of letters. His perception on Kaiga is entirely different from the way concerned scientist or an engineer looks at the project.

Shivaram Karanth has always had a deep interest in sciences and does not deal with social problems alone. He has written an encyclopaedia for children, known as "Bala Prapancha" and four volumes on popular science known as "Vijnana Prapancha." He has also translated certain
crucial works on nuclear energy into Kannada, including "Atoms today and tomorrow" and has just completed the translation of the Second Citizens' Report on the State of India's Environment, the most comprehensive document of its kind in the country.

The Kaiga issue is very close to Shivaram Karanth's heart. Every year he spends some time in the forest. Kaiga is situated in the Uttara Kannada district, adjoining Dakshina Kannada District to which Shivaram Karanth belongs. As such, he is acquainted with these tropical rain forests intimately and is greatly concerned about the need to preserve what is one of the richest reservoirs of plant and insect life, which unfortunately is being wiped off the face of the earth.

Shivaram Karanth was shown a satellite photograph of the Kaiga range, that disclosed a seismic fault. It was vital to discover whether the fault cut through the site. Shivaram Karanth discovered that the crack ran across the river, at precisely the point at which the Kadra dam was being erected. He opines, "The impounding of the river water is bound to trigger tremours on both sides." You have a 280 MW hydro-electric power house on one side and a 470 MW nuclear power station on the other. "You cannot cover the tear with concrete if the crack in the earth runs down right through to the tectonic plate." To situate a reactor on a seismic threshold violates all siting criteria and at Kaiga the dam is acting as a catalyst.
To the question why a nuclear station is being sited here, against such odds, Shivaram Karanth replied, "There are two interests, First, you have industrialists led by Birlas, who want power at any cost. The Birlas have a polyfibre plant at Harihar, for which they want an assured supply of power. The plant is already a major source of pollution. The river turns up dead fish at the point at which they are letting the effluents out. The only other reason I can think of for such blind insistence on situating a reactor here, is some defence objective which is not disclosed."²

Shivaram Karanth is committed himself openly and completely to the tribals' struggle against the siting of the nuclear station at Kaiga. He sent a folk theater group he had set up himself to participate in a "padayatra" which the environmental groups had organised. According to Shivaram Karanth Kaiga decision was left entirely to the nuclear authorities and we cannot allow the nuclear scientists to decide the future of our lives and the lives of generations to come. The use of any natural resource raises a very fundamental moral question. Do you have the right to dispose of any natural resources? You have no permanent rights over any resource. You cannot denude the forests, or bury lethal nuclear wastes in the ground, which remain highly toxic for millions of years. The casks break open and the contents leak out into the water table and contaminate the whole environment. You are only tenants on this earth. Man has lived on this planet for millions of years. Should not people live hereafter? Is it for the DAE to decide?³
In an attempt to force the Department of Atomic Energy (DAE) to be publicly accountable, the voluntary organisations protesting against the siting of the reactors compelled the government to convene a joint meeting of the DAE chief with the environmentalists. In the meeting, there were no clear or unambiguous replies to the environmentalists' questions, but only bold dismissals - that adequate precautions were being taken and that nuclear power was the energy source of the future. Shivaram Karanth's view is, "you have no power over people who don't believe you. You have to carry conviction if you want their support. You can call us the illiterate masses, but you have to carry us along. We may be totally wrong, but we have the majority. You have to convince us. But that is not their attitude. They come here to blast us, to silence us, as though we have no right to ask a question. It won't work."  

Shivaram Karanth further says, "We cannot be neutralists any longer; neutralists are dangerous. They have no courage of conviction. They can join any camp. When I know certain things I must and will speak out. Or what is the voice left in me for? I want to survive and play my part. I want mankind to survive."  

Raja Ramanna, then Chairman of Atomic Energy Commission and other nuclear authorities went on record saying that the Chernobyl type disaster cannot happen here because our designs are superior. Shivaram Karanth does not accept this justification and such arrogance cannot be
a part of scientific language. All over the world people are still conducting experiments on nuclear power, seeking to refine it. We don't conduct any research but yet make claims. According to Shivaram Karanth, we cannot trust the words of scientists because of their arrogance.

Karanth agrees that the country needs power. But we must know why we want power? How much we want and what is our capacity in producing energy. Energy should be distributed for the benefit of all people but not to provide electricity to the major industrialists at concessional prices. It should not be costly. It should be made available to the villages. In order to produce energy, deforestation, huge foreign debt or any other oppressive methods are unwanted. Self sufficiency should be maintained.

Environmental pollution should be as minimum as possible. For this, water, air, light and natural resources should be sustained and such technology should be developed. The firm conviction of Shivaram Karanth is that it is not sufficient if we think and plan about energy production only. We should also see that the produced energy is not wasted by leakages, and misuse should be prevented. The corruption in these things should be removed. Further, he suggests that, there should be regulations in consumption also. We should try to attain self sufficiency.

By development of forests, a number of environmental problems are solved. Barren land is found everywhere and measures should be taken
to “Green” it. Development should be attained by making use of renewable resources.

Shivaram Karanth’s opinion is that production of nuclear energy is dangerous and the entire world has come to know it. The developed nations have given up producing nuclear energy because of its excessive cost and enormous loss in transmission. It was not possible to prevent the accidents in America and Russia. These nations have huge capital, technology, security, honesty, discipline, integrity and preparedness. Even then they have abandoned nuclear energy.

In India, we are starting nuclear plants with the aid from foreign capitalist countries. The plants we have already started are not functioning even to their half capacity. Some are closed and every nuclear plant had accidents. Due to radiation into environment around the nuclear plants, there are incidents of deformities in human bodies.

Shivaram Karanth opines that the nuclear plants should be monitored carefully. Any slightest negligence will lead to environmental pollution and it affects the neighboring states also.

After 25 years of their life span, the decommissioning of nuclear plants proves to be very expensive. Its radioactive half-life is thousands of years. By terrorist activities, sabotage of floods if the radiation leaks out, the
damage and loss to the nation is huge and we will face disasters in our country similar to the Chernobyl disaster. Moreover, the effect on future generations, animals and birds will be quite hazardous.

In our corrupt inefficient system we cannot manage nuclear power plants properly. But the scientists speak much about their efficiency etc. But, we see the things that are taking place every day which nullifies the scientists' views about nuclear power plants. In December 1988 Shivaram Karanth participated in a National seminar on nuclear energy held at Bangalore. But, the outcome of the seminar was nothing. The opponents of Kaiga and the supporters of Kaiga, i.e. the scientists presented their own viewpoints. Nothing worthwhile transpired in the seminar.

Shivaram Karanth's firm belief is that the nuclear energy is dangerous. In view of this he covered most of the villages of North Canara to mobilise public opinion against Kaiga.

Shivaram Karanth and Elections:

In 1989 parliamentary elections, Shivaram Karanth contested the election on the plank of environmental protection. According to the interests of environmentalists, Shivaram Karanth agreed to contest elections for the sake of protection of the environment. He felt by contesting the election, people get awareness at least to some extent about the environment. The purpose of environmentalists in making him one of the candidates at the elections was to create awareness among the people.
Shivaram Karanth was on foreign tour according to his pre-election schedule. But his supporters and environmentalists canvassed in the remote villages of North Canara and propagated about Karanth’s message on environment. Karanth was well aware of the defeat in the elections, before the elections were held. But he agreed to lend his name to the environmentalists. During the same time, Ramakrishna Hegde, the then Chief Minister of Karnataka had asked Karanth to contest the elections from the same constituency or any other constituency as a Janata Dal candidate. If Karanth had contested as a Janata Dal candidate, he would have definitely won in the election. It was Ramakrishna Hegde’s Janata Dal government, which brought environmentally non-sustainable nuclear plant to Kaiga. Therefore, he rejected the offer of the Chief Minister.

For Karanth, elections are synonymous with corruption. Hence, the victory or defeat was not important for him but what was important was truthfulness and principles. Even then Karanth secured 60,000 environmentalists’ votes. This is not the first time Karanth contested the election. He had contested elections in 1952 parliamentary elections also, with the intention of organising opposition parties.

When Indira Gandhi contested the election from Chickmagalur, Karanth was ready to fight against Indira Gandhi in the elections. But, Veerendra Patil contested the elections and was defeated. In all these struggles environmental protection was the main concern and not the lust of power.
Karanth is taking active part in all the environmental agitations that are going on in the country. He is the president of Andhra Pradesh Environmental Protection Committee, Vishakhapatnam. President of Dharwad Samaj Parivarthana Samudaya. In the All India Nuclear Plants Seminar, he was the president of Kaiga nuclear plant discussion, organised by Karnataka Government science, technology and environmental departments. He addressed people on “Save Narmada” agitation and inspired lakhs of people. He was main speaker in anti-nuclear conference held in Kerala. He participated in the Karwar Naval Sea Bird Refugees agitation. He is taking part in all environmental agitations, seminars, conferences in the country. He accepts every one’s invitation to agitate against environmental degradation. He has filed petitions in the Supreme Court and High Courts against Kaiga nuclear plant, Harihar Polyfibres, Sharavati tail race, Nandikur power station, etc.protesting against environmental degradation.

He has read vastly and is thoroughly knowledgeable on environment. He has been familiar with domestic and foreign publications on environmental problems, energy production, use of alternate methods in energy production etc. He is keeping himself well equipped with environmental knowledge. He has also translated a number of important English works on environment into Kannada. He has also published a number of articles in famous newspapers and magazines.
When asked, "At your age, you could have retired blissfully, what drives on you on?" He replied, "I am interested in life and this sustains me, my definition of life goes beyond human kind. I don't subscribe to a human centric world view. We have inherited the earth and we have to keep it for the future."\(^6\)

**Elites' Perception of Kaiga Nuclear Plant**

1. **Kaiga Site Selection**

The environmentalists view that the site is unsuitable for a nuclear power project on ecological, geological, geographical and strategic considerations. There exists a strong movement, which consists of eminent technologists, scientists, economists, environmentalists and ecologists who have exhibited a rare degree of sophistication and expertise in matters nuclear plant to oppose it.

They opine that the Kaiga site is most unsuitable for the installation of a nuclear power plant because, Kaiga is situated in the center of 11 big dams and in the heart of the dwindling rain forest. It is as near as 40 kms from Supa dam, which is quite a vulnerable seismic point.

Elites have opposed the Kaiga site on the basis of M.R.Srinivasan Committee report on site selection and the Rapid Environmental Impact Analysis (RAIA) report prepared by the National Environmental Engineering Research Institute (NEERI), Nagpur. Here it is assumed that reports on
Kaiga Project represent elites' viewpoints. The two reports referred to above state that the Kaiga site is most unsuitable for the installation of a nuclear power plant for the following reasons:

1. In respect of the storage of solid radioactive waste, rocky substrata and low water table are desirable for safe burial and containment of waste. But in the Kaiga area, the report notes that the water table is above ground level in the high water table season.

2. In respect of the release of gaseous waste, plain topography surrounding the site is desirable. But, the report notes that at Kaiga, the topography is predominantly hilly, somewhat resembling a large bowl with a valley providing the opening. The calms are also reported to be high.

3. In respect of access and transportation facilities, Kaiga has no better transportation facilities.

4. In respect of foundation conditions and the seismic environment, a prospective site must be endowed with good bed rock conditions, but the site selection committee has done only limited bore hole investigation and provides no data about these.
REIA says much about the bed rock and seismic conditions. It states that "the whole area has undergone extensive laterisation and among the 17 bore holes dug for geological investigations, core recovery has been poor to very poor."\(^8\) Regarding the seismic environment the following are the observations of the REIA:

1. There are major geological faults in the region between Haliyal and Sirsi. The Kaiga site straddles a confluence of three major faults which makes the site vulnerable.

2. The Kaiga site is in a parallelogram, whose south-western angle was the epicenter of the famous earthquake triggered by the Koyna dam reservoir.

3. The course of the Kali river runs parallel to liniment No.11 and this is a source of major concern as seven dams of the size of the Kadra dam have been planned.

4. The 1967 earthquake has been followed by after shocks and at least one after every monsoon is generally of high intensity.

5. The Koyna earthquake was triggered by impounding of water, and seven reservoirs of the Kadra type which have been planned will go a long way in lubricating faults, fissures, joints from a seismological point of view.

6. Liniment No.11 is specially active and the Kali river runs parallel to it. The Kaiga site and its water resources are intimately connected with it.\(^9\)
It is clear that from a geological point of view that Kaiga does not satisfy the basic criteria required of a site for an atomic power plant. According to a press note, given for favour of publication from Panjim, Goa, in setting up of this project, the Department of Atomic Energy has contravened the following criteria in site selection.10

1. Kaiga receives very high rainfall, more than 3000 mm per year.
2. Wind velocity at Kaiga goes beyond 100kms per hour.
3. Solar ponds to evaporate low level nuclear wastes are not feasible in this area.
4. During an emergency, the area gets isolated rendering evacuation impossible.
5. The site falls within seismic zone 111, close to the boundary of zone 11, as per the revised seismic zoning map of India.
6. A primary deep seated north-western-south-eastern fault which runs from Cauvery basin upto Ratnagiri lies just about 70 kms north-east of Kaiga, as shown in the ONGC (Oil and Natural Gas Commission tectonic map of India.)
7. Another NE-SW trending fault, which runs upto Tungabhadra dam and curves down towards Nagarjuna Sagar, is only 60 kms south-west of Kaiga, as discovered by the Geological Survey of India.
8. There are four more faults that lie within 25 to 115 kms of the Kaiga plant site.
9. There are several clusters of epicenters close to Kaiga, with magnitudes going upto 5 on the Richter scale.
A review of the reports of the three previous site selection committees reveals that Kaiga was never mentioned by the Hayath (1962), Vengurlekar (1975) and Kati (1982) committees, while every other site such as Kalpakkam, Kundakulam, Tungabhadra and Nagarjuna Sagar have a history of being favourably considered by successive site selection committees. Kaiga does not find a mention in any of the earlier reports. Even more intriguing is the fate of the Kati Committee report which was submitted as late as October 1982, which also does not recommend Kaiga. In September 1983 Srinivasan Committee was constituted which submitted a new list of suitable sites. Kaiga came from nowhere to the top of this list.

Elites and common people feel that by the establishment of Kaiga nuclear plant, the rain forests which are a rare ecological niche and a collective heritage of the people of India will be destroyed. They say there are alternatives to nuclear power itself. But there are no alternatives to a tropical rain forest. What we lose today, we lose for ever. Therefore the main argument against the plant's location was that it would destroy the delicate ecology of the western Ghats.

Vishnu Kamat, an environmentalist from Bangalore, asks how the site selection committee resolved the dilemma of objective facts that disqualify Kaiga and the subjective compulsions of installing a plant there. The report answers the question by stating that only "techno-economic" criteria were relied upon in recommending Kaiga as a suitable site.
Infact the then chairman of the Atomic Energy Regulatory Board (AERB), in a moment of honesty, admitted during the December 1988 debate that Kaiga was a political discussion. If so, can the welfare and the democratic will of the people be sacrificed at the altar of political expediency? No answer to this question was forthcoming.

Another point raised by the elites is that an atomic plant ought not to be built in such proximity to the naval shipyard 'Sea Bird' project which is coming up on Karwar's coast. The Kaiga village situated on the banks of the river Kali is very calm and quiet. It is surrounded by thick rain forest. By the construction of urban areas, townships, roads, atomic ash, the ditches to bury the waste, Kaiga's integrated environment will be severely damaged. Elites generally feel that, there are no examples in the world of a nuclear power plant being established in a rain forest region. If Kaiga project comes up, its ill effects on the biological species would be considerably harmful. Due to the opposition of the elites and people, the central government prevaricated, promised to reconsider, but ultimately decided to go ahead.

II. Nuclear Power : Exploration and Knowhow

The highly developed and progressive countries like U.S.A., Russia, France, Germany, U.K. etc., could not build fool proof nuclear power plants. Many reactors in the world had a slow leakage or an explosion. It is also possible that there could be a cloud of radioactive material as a result
of radioactive decay from a nuclear plant. This being the case, it is doubtful if the Indian plants do not leak because our expertise and know-how is definitely poor as compared to that of the developed countries.

The structure of the nuclear power plants, the methods of production of nuclear power, the handling of waste materials, the difficulties in the decommissioning of the nuclear power plants, the probability of hazards and accidents in the power plants require careful and highly skillful technical expertise.

With proper techniques and investigations nuclear scientists should be able to generate power. But such power is always accompanied by emission of harmful radiations, which are beyond the control of scientists. Some countries have banned the installation of nuclear power plants, in spite of their meticulous planning, care and supervision. In the light of this, we require to follow higher standards of planning, care and supervision, as the normal methods of planning, supervision and investigation will not be useful in establishing nuclear power plants. A number of safety measures are to be considered not only during the power production but also after the decommissioning of the plant. These aspects of elaborate procedures and likely problems associated with the nuclear power plants are a unique and necessary evil.
Chernobyl is to be taken as the eye-opener by all those who support the nuclear power production in the country. The loss to life and damage caused to soil as also buildings etc., is in a sense irreparable.

Indeed there is no better subject with which to scare away people than nuclear energy. What is new, what is not completely understood is always frightening. But nuclear energy is a special case. It comes from a remote part of research that in the minds of many people, borders on science fiction. It was developed in war time and was shrouded in secrecy.

Elites feel that, the government should think twice before establishing a foolproof nuclear plant. Because, even if the probability of leakage or explosion is quite small, it causes enormous loss if it takes place once.

The scientific community has to be quite abreast in regard to their knowledge and understanding of matters connected with atomic and nuclear energy. Only then the reactor can play very beneficial role. The scientific community has to speed up research and always be prepared to face challenges - theoretical, experimental and technological. The engineering aspects, mainly civil and mechanical should also be given utmost attention.

Above all, the reactor has to be designed with utmost care. The design depends on the type of reactor, the fuel, the moderator, the coolant control rods etc. The efficiency with which the energy can be extracted
from the reactor is another important consideration and depends on the expertise, know-how, integrity and discipline of the people who man the units.\textsuperscript{15}

In advanced countries there seems to be a great deal of rethinking on nuclear power policy. It is learnt that in May 1983 the US Supreme Court in a 9 to 0 decision upheld the California enactment passed in 1976 banning nuclear programmes till the federal government finds a way to dispose of permanently the radioactive waste products. For the nuclear technology to develop, the related technology should also develop to the appropriate level. The first step in this direction is in respect of materials needed at various stages. The next step is the development of materials technology. All these developments should be matched by an electronics technology of highest calibre.

The working of a reactor depends on the various control systems of high precision. This necessitates the growth of computer technology. This also gives programmed instructions, monitors the working of every part of the unit, indicating and correcting the malfunctioning of any component and thus regulating the working of the whole system.\textsuperscript{16} All these experimental and technical expertise should be backed by theoretical research which could predict results, anticipate possible mishaps, refine existing theories, formulate new ones and so on.
Thus it is evident that nuclear technology indirectly involves many other disciplines and their coordinated efforts. In the absence of this, there would be discontent of disapproval by a section of the people who continue to oppose nuclear power plants. There is growing concern among the laymen about the long term ill-effects of nuclear power on people and environment. The committee headed by Ramanandayya, President of North Canara Zilla Parishat opposed the excavation of uranium near Arebail because, exploration and disposal of the uranium waste requires careful planning and execution.

Vishnu Kamat, a noted environmentalist from Bangalore, asked Srinivasan, former Chairman, BARC - “Our technical know-how and systems are so poor, that if there is a fire to a multi-stoeryed building, we cannot extinguish or control it efficiently. When such is the case, if any accident occurs in Kaiga, do we have the capacity to control it?” But Srinivasan did not answer it properly.17

A study sponsored by the Friends of Earth in the United Kingdom has shown that an ever expanding nuclear power programme will never become a net producer of electric power.18 Nuclear technology is not beginning. Neither is it forgiving. For safe operation it requires, in the words of one of its ‘fathers’, a ‘technological priesthood’ willing to give meticulous attention to routine details.
It has not been possible to retain the highly skilled and trained manpower required for operation and maintenance of nuclear plants. There is an exodus of the available highly skilled manpower from all units including Taps and Raps (Tarapur and Rawatbata atomic power stations). It is learnt that many highly qualified and experienced persons have been resigning to get more lucrative jobs elsewhere. To fill up these vacancies would require a lead time of at least 3 to 4 years. The main reasons for such resignations appear to be lack of incentives, employees' low morale and lack of career development under the present system.

Nuclear power plants appear to be rendering less efficient service because of reported deficiencies in the training of operating staff coupled with lack of clarity in the operating procedure, failure of organisations to learn the proper lessons from previous incidents etc. These shortcomings are attributed to the suppliers of equipment and to the government agencies that regulate nuclear power. In the light of these, people feel that the technical know-how of nuclear energy is complicated and beyond the comprehension of laymen.

Nuclear technology suffers from genuine problems of safety and waste management. Mainly for this reason the civil application of nuclear energy in the west has become a matter of serious controversy.
We are now set on building the Kaiga nuclear power plant and any serious problem that might crop up later would be very difficult, expensive and time consuming to correct. We have placed most of our eggs in the less experienced Canadian Deuterium-Uranium (CANDU) basket. In fact, the CANDU reactor at Pickering suffered a failure of a large number of pressure tubes when the Canadians least expected it. In India, besides the CANDU, we have American Boiling Water Reactors (BWRs) at Tarapur. Negotiations regarding the import of French Pressurised Water Reactors (PWRs) are also under way. It is also proposed to import Russian VVER type of reactors to be installed at Kudankulam which are different from Chernobyl reactors.

This multiplicity of reactor type is in itself a hazardous since their safety systems are entirely different and the experience gained on one reactor type is of no use in dealing with an emergency in a different type of reactor.

Even these many different types of reactors are not going to ensure the success of the Indian nuclear programme. For that a new kind of reactor known as the Fast Breeder Reactor (FBR) is planned in India, in the later stages of nuclear energy production.

But the operating experience of FBRs has been minuscule. They present entirely new and horrendous safety problems. Unlike conventional
(thermal) nuclear reactors, they can critically rearrange themselves to explode like nuclear bombs.

**Alternative Sources of Energy**

The apprehension of a large number of elite and people of Uttara Kannada district about hazardous effects of Kaiga has made them to suggest the establishment of some more hydro-electric power stations to meet our power requirements. The cost of production of hydro-electric power is much less compared to any other source of electric power. So, they feel the government must examine the possibility of establishing new hydro-electric power stations instead of nuclear power stations. They also suggest that govt. may explore possibilities of utilising solar, thermal or biogas energies to meet the needs of the region.

Late Prime Minister Pandit Jawaharlal Nehru too wanted biogas units to be setup in every village panchayat in the state. He told Krishna Iyer, when he was the electricity minister of Kerala, that small units in large numbers can be useful like the big projects. As the Uttar Kannada district is overburdened with government schemes and projects like the naval base i.e. Sea Bird, the Kaiga etc. people feel Pandit Nehru's observations as the most relevant and correct in the present context.

With regard to the Demand-Supply profile for the total energy needed for the country and the state of Karnataka, we have two alternatives. One is based on the projection into the future of the present rate of increase
in energy demand, assuming a 5 per cent growth of GNP. This shows that both for India and Karnataka all the thermal and hydel energy sources will by the 21st century leave a gap of over 40,000 MW for India (which is 10% of the 4,00,000 MW needed) and over 6,000 MW for Karnataka, which can only be met by the use of nuclear energy, including the Kaiga nuclear plant in the case of Karnataka.21

The other alternative scenario is based on improved efficiency and the use of efficient inputs in power generation and economy in its use, for instance, as in transport and pump sets and resort to tested alternatives like solar cookers, water heaters, biomass etc., so that the demand for power for both India and Karnataka can be met by thermal and hydel sources, with no resort to nuclear energy for India and making the Kaiga plant for Karnataka unnecessary.21-A

Late Malcom S. Adiseshaiah, Chairman, Madras Institute of Development Studies had proposed that we, of all the well to do classes and our richer classes, should accept a small reduction of our power intensive consumption, which incidentally, can improve the living levels of the mass of our people living in poverty.22

In the draft Fifth Five Year Plan this was proposed with a small 5 per cent cut in the consumption of the top 3 deciles of society was seen to result in a 55 per cent increase in the consumption of the bottom 3 deciles.
With this kind of restructuring of our consumption structure, we will also reduce our energy demand and can make superfluous the nuclear power projects.

**Financial Burden**

Nuclear power programmes are enormous resource guzzlers. They consume large quantities of essential resources like steel and cement and above all electricity. To cater to the power demands of the Kaiga reactor only, in Uttar Kannada district two hydro-electric projects at Kadra and Kodasali have been taken up.

Uranium enrichment factories consume 25 per cent of all the power generated by their nuclear reactors in the U.S. In our country, the same percentage probably holds good for the extraction of heavy water. The first six or eight years of any nuclear power station go towards repaying the electric energy consumed in setting it up.

Shivaram Karanth whose viewson the kaiga project have been stated earlier indicate that the new government which came to power in the center in 1989 should have analysed the usefulness of the Kaiga nuclear power plant. Since this was not done, by investing huge amounts in such projects the country will be foreign debts. According to him the World Health Organisation had asked the World Bank to stop funding all projects which damage the environment. He further maintains that the countries which have adopted such huge projects which are detrimental to environment are in
financial debts. India, Bolivia, Argentina and other developing countries are already in foreign debts and investment in such projects as Kaiga will further increase their burden of debt. Shivaram Karanth further feels, because of Rajiv Gandhi's wrong policies the country is in 50,000 crores of rupees of foreign loans. Therefore, he asks the new government at the centre to re-examine the Kaiga nuclear project. If not, he feels, it will become a burden to the country and will not help in any way in the development of the country.

Before a nuclear power plant produces energy, a vast amount of energy is invested in establishing the plant-vastly more in quantity and quality as compared to that going into thermal or hydel plants. In other words, the nuclear power plants require 8-10 years for installation and operate for just 25 years, but they require hundreds of crores of rupees. So energy produced by nuclear power is very costly and it is not beneficial to India or Karnataka.

A.N. Nagaraj, a former biological consultant with the United Nations Food and Agriculture Organisation (FAO), is of the view that tremendous resources would be required to manage the fuel and other low-level radioactive waste. The undue reliance on foreign aid and investment for big dams has indebted the country for years to come.

**Scientists May Not Face the Truth**

Inaugurating the two-day south India regional conference of the
Citizens For Democracy (CFD), Shivaram Karnath said that scientists like Srinivasan and Rajaramnna had deliberately told lies that the Kaiga plant would not endanger lives of people. He said, Parliament and civil rights activists must take scientists to task and challenge for their lies. Further he alleged that scientists are not telling the facts about the hazards of nuclear energy and they cannot keep back their lies like this because people are master.

V.R. Krishna Iyer retired Judge of the Supreme court of India feels that the scientist are uttering lies. He said, he suspected the country’s nuclear power programme was linked to the production of a nuclear bomb. “I ask the centre : Is there a weapons programme? Are you getting ready for Pakistan? The nation should be taken into confidence. You should not tell lies.”

Talking about the scientific evidence in favour of establishing the nuclear power plant, Shivaram Karanth labelled the evidence as “tall claims” and asserted that as long as a majority of the people of the region nursed a fear over the proposed project, there would be stiff opposition to its construction. All these aggravate the apprehension of elites as well as the people and develop negative and hostile attitude towards the policy of the government on Kaiga Project.
Official Acts Are Kept Secret

A number of official acts and documents relating to the Kaiga nuclear plant are kept secret and not made available to the general public. Though some documents are available, people's opinion is that, the perusal of the documents and reports had revealed that they were merely a set of (hoodwinking) documents prepared to satisfy certain statutory obligations. The Kaiga nuclear power project was long surrounded by an atmosphere of secrecy which hampered communication about its civilian applications.

The then minister for urban development R.V. Deshpande asked in the national debate on the project as to why information concerning peaceful nuclear programmes should be withheld? If our national programme is for peaceful purposes, where is the necessity of the secrecy. The minister however wanted nuclear projects to be brought under the purview of the Environmental Protection Act and the establishment of an independent body to audit the effects of a nuclear project in order to win the confidence of the people.

In the words of Arun Ghosh, one problem here is the total lack of information on the subject. Everything about the nuclear power programme in India is hush-hush affair, on par with our defence programme. But even the little that is known is enough to show that the nuclear establishment is ignoring the potential of nuclear energy which may cause irreparable harm.
Unlike other countries there is no independent nuclear expertise available in India. Anything to do with reactors is taught only at the Bhabha Atomic Research Centre (BARC) training school. This centralised "cradle to grave setup" does not allow any critical evaluation about the working of nuclear establishment by any independent voluntary organisation. Nothing is being done to correct this deficiency.

It seems that the higher ups are of the opinion that, the public are not to be taken into confidence in the matter. The views of the elites and people for whom all this development is being planned do not matter. But, what matters is the perception of our ruling elite in regard to what is good for the people.\textsuperscript{32}

Since the subject of nuclear energy is shrouded in secrecy and it is difficult to get any reliable data, the political elites, the intellectuals and the common people are unaware of the seriousness and implications of the government decision to generate power through nuclear technology.

There are contradictions and dilemmas, different pulls encoded in the use of nuclear energy. It is therefore necessary to create a well-informed public to discuss and debate the implications of such a momentous decision so that policy can be anchored in consensus.\textsuperscript{33} Therefore the policy of government on Kaiga Project has become controversial.
Even in America newspaper reports and Congressional discussions reveal that a series of serious reactor accidents have taken place but the public has not been informed. It is reported that in the Savannah River nuclear complex in South Carolina, at least 30 serious reactor accidents including two fuel meltdowns were kept secret from the public. It is also disclosed that vast amount of radioactive and toxic wastes have been released in the soil, surface streams and ground water from these nuclear stations.

A Congressional panel revealed that the government was aware for decades that the nuclear centre at Fernald, (Ohio), was releasing radioactive particles into the air and leaking uranium wastes into the underground water supply and in the great Miami river, but took no action to protect thousands of local residents and workers. The Congressional panel also revealed that accidents, safety violations, and radioactive releases have also taken place in other plants, such as the Hanford Reservation in Washington State and the Colorado's Rocky flats plant.

When this is the case in America which is known as open society and more democratic, India cannot be an exception in maintaining absolute secrecy about nuclear matters. This tends to create fear in the minds of people. In fact, openness and fairness are the key to a sound and objective decision. Absence of these attributes in environmental decision making puts the process in India in a very dubious position.
Melcolm S. Adiseshaiah, summing up the proceedings of the National Workshop on Nuclear Power remarked that in India, the government is not able to publish any report on the state of the art of nuclear technology and nuclear power plants in operation, because the Atomic Energy Act 1962 does not require AEC to:

a. report on every incident to Parliament and the public.

b. make an enquiry into each serious 'incident' by a neutral regulatory committee; and

c. make the resulting report and its findings public.\textsuperscript{35}

In other countries which are exercising the nuclear option for civilian purposes, there is not this veil of secrecy surrounding this operation. These countries are able to follow the above three point procedure and able to establish the state of the art on the nuclear technology and its civilian uses in their country. In the light of the foregoing observations, it appears necessary either to amend the Atomic Energy Act of 1962, or simply to repeal it. By so doing, the people of this country can be kept informed about the state of the use of nuclear technology for generating power.

\textbf{The Success of Kaiga Depends on Successful Completion of Kadra Dam/Port/etc.}

The elite and the environmentalists feel that the Kaiga project is a mammoth one, the dimensions of which only a few have realised. A successful working of Kaiga atomic power plant depends upon the successful
completion of the Kadra dam, which itself has overrun its time schedule by over three years and is still not even half complete. Kaiga is viable only if the Kadra reservoir receives the requisite quantity of water after which a 3 km long channel has to be constructed for the outflow and inflow of water at the atomic power plant.\textsuperscript{36}

The source of cooling water is from the proposed Kadra reservoir of Kali river flowing nearby. The state authorities have assured minimum continuous outflows of 100 TMC of water from Kadra reservoir which average flows being more.\textsuperscript{37} Meanwhile, the completion of the Kaiga project depends on the development of Karwar port, which would provide berth facilities for ships of the requisite tonnage which can bring in heavy equipment to be erected at the project site.

Simultaneously, the forests are being surveyed for the laying of high tension live wires to energise the reactors as well as to transmit power over long and difficult terrain. Each of these projects by itself can be daunting and the success of Kaiga is dependent on the simultaneous success of all these factors.

\textbf{V.R.Krishna Iyer’s viewpoints.}

V.R.Krishna Iyer, retired Supreme Court Judge has expressed his strong views against nuclear energy on several occasions and in the national seminars on nuclear power. He has thus provided the rallying point for anti-
nuclear energy activists. Iyer opines, that nuclear power generation is fraught with risks and notes that reprocessing and burial of waste poses a great danger. He declared, "If Gandhiji were to be alive, he would have gone on fast unto death against nuclear energy".  

Pointing to the earthquake in America and in Russia, he said he would charge atomic scientists with murder if a similar thing happened in Rajasthan where an atomic power reactor is situated.

He further says the worldwide trend is to minimise nuclear energy programmes. Sweden was phasing out all its plants, while the United States had not added any new plants since eight years to its existing 54 plants. Japan had cut its nuclear power generation capacity in 1984 and reduced construction activity to two nuclear reactors per year. France had slowed down its programme for nuclear reactors from six in 1980 to one. He continued to add. "In the USSR., people are now protesting against nuclear power plants. Brazil had cancelled six out of eight orders and delayed two while Argentina had canceled four, Greece had scrapped its nuclear energy programme and Belgium had decided to postpone its expansion programme."

V.R.Krishna Iyer also says Spain had 5 reactors under construction, West Germany had not built any new plants in the past 10 years. Switzerland had cancelled its programme and Denmark and Norway had vowed not to construct nuclear power reactors.
Continuing Iyer took exception to Srinivasan's stand that Kaiga would go ahead despite public opposition and said, "It is like the accused becoming a judge and acquitting himself." He further said the nuclear scientists should seriously think of the hazards of nuclear accidents and spend "sleepless nights". He further feels that transmission losses should be cut down instead of raising nuclear power production. The percentage of such losses in the world was 9 percent, U.S. 6 percent, India 22, and Kerala 29. He said, if only a fraction of the cost of the nuclear energy programme was diverted for the solar programmes, we would have advanced. But we have contempt for solar and wind power projects. He feels that the Atomic Energy Commission with all its dreams fulfilled would be able to produce only 10 per cent of the country's total power requirements.

He is of the firm opinion that the country would do better by tapping the abundant non-conventional source of energy like solar, wind, tidal and biomass- the sources treated with contempt by the nuclear power authorities.

People strongly feel that, projects which result in maximum benefit to the people with minimum social cost have to be identified. They underscore the need for cutting transmission losses which were 22.5 per cent in India and as such alternative sources of energy should be developed to meet the requirements of society.
Some people feel that representatives elected to the Parliament and state legislatures are not aware of the likely harmful effects of the Kaiga project. If they were aware, they would not have allowed the project to come up in Kaiga. 43

Even though the work in Kaiga nuclear project is in progress and some Rs. 80 crores are already spent on the construction of the project, people are not willing to accept the project and are opposing it.

The people who oppose the nuclear plant feel that if a brand new nuclear power plant costing five billion dollars could be mothballed in New York due to public protest. Rs. 77 crores, if measured in terms of the costs to the environment and people's health, should not to be a consideration. Hence, the Kaiga plant which has cost Rs. 77 crores so far, should be abandoned. 44

The people and elites of North Kanara view that they oppose the Kaiga power plant on certain relational criteria. This North Kanara district already consists of and is full with a number of hydro-electric power projects. Now, the state power corporation has undertaken some more power projects. On the top of this some chemical factories have also created some problems in the region and fear in the minds of the people. 45
Sanjay Havanura, a young engineer and environmentalist of Bangalore, opines that the real threat to the rain forest around Kaiga is not restricted to such tree felling activities but also cause genetic damage to plants because of increased radioactivity. He says experiments conducted around the Hamaoka reactor in Japan and elsewhere have given conclusive evidence in regard to genetic damage. He says the Bhabha Atomic Research Centre (BARC) which is instrumental in establishing the Kaiga power project has announced the setting up of a project to study the possible effects on the plant ecology around Kaiga. This is like dropping a nuclear bomb on a city and then sending an expert team to study the possible radiation hazards on human beings.46

The Atoms for Peace, Movement, just as the Atoms for War, has become a question of wide debate. It has now been realised that without its military spin-off, it is not an economical source of power. But the nuclear development in the technologically advanced countries primarily had begun as a military necessity and the atoms for peace policy emerged as its by-product. The less developed countries on the other hand have a choice before them, for their avowed choice of peaceful utilization of the atom, would inevitably lead them to weapon oriented industrial-economic nuclear system. Political vested interests and regional imbalances are likely to precipitate nuclear weapons race, ignoring the priorities of energy development for the people of less developed countries.47
Dhirendra Sharma, articulated the stand of the anti-nuclear activists. He said, "if we activists are proved wrong, nothing will happen to AEC. But if your judgment goes wrong and the unborn generations are exposed to the horrors of radiation, will you take the moral responsibility, when you will not be here any more? Is it fair to expose future mankind to the inherently unsafe technology?"  

T. Shivaji Rao, Professor of Environmental Engineering, Andhra University, urged the union government to bring in legislation similar to the Price Anderson Act of the United States which provided for adequate compensation for those affected by nuclear radiation in the normal course.

In order to push up our power generation, we may throw safety to the winds, and hurriedly complete our nuclear power projects without any regard to the dangers posed by our nuclear programme.

The Planning Commission in order to achieve a 7 per cent rate of growth of economy during the eighth plan period, switched all available investible resources to securing immediate increases in output. In the process, we may ignore plant maintenance (which may adversely affect income generation during, say, the ninth plan period); we may forget the problem of environment degradation and we may hastily get our power generation up by 12 to 15 per cent annually; in order to sustain such an overall growth rate. In the process, we may destroy the ecological balance.
Late Malcolm S. Adiseshaiah, Chairman, Madras Institute of Development Studies, summing up the proceedings of the National Workshop on nuclear power plant with special reference to Kaiga held on 10-11 December 1988 at the Indian Institute of Science, Bangalore, pointed out, with regard to the Kaiga plant, there are disagreements in areas in the following issues where there should be no disagreement.50

First, there is no agreement on the cost of the plant. AEC states that the first two units of 235 MW each will involve an investment of Rs. 600 crores. The government stated in Parliament on 29 November 1988, that the investment would be Rs. 720 crores. There is need to establish the investment cost on a precise basis and there should be no disagreement on this objective fact. Further, the investment estimates should be given in two series, direct costs and indirect costs.

Second, there is no agreement on the extent of the land that is to be taken over for the plant. AEC states that 120 acres are to be used for the plant. The engineers on the site refer to 762 hectares which will be involved. This should be clarified.

Third, the forest area involved should also be specified. AEC estimates 25 hectares of forest, whereas the local people say that ten times that extent of deciduous forest will be destroyed.51 Here again precision is needed on this fairly simple objective factor.
Walter C. Patterson rightly says in the Introduction to his book "Nuclear Power", "The nuclear predicament of Nuclear Power is that, for four decades the world has been learning to live with nuclear energy. The learning process has been exciting, frustrating and sometimes frightening; it is far from over. Indeed it may be just the beginning. We have learned a great deal about how to release nuclear energy; how to control it; and how to make use of it. We have even learned to take it for granted. But we have not yet learned to live with it. Nuclear energy in all its aspects is already shaping the world. The future of our globe will depend to a startling extent on what we know about nuclear energy and what we do about it. The crucial decision will not wait another four decades.\textsuperscript{52}"

**PARLIAMENT AND KAIGA PROJECT**

According to the Indian Constitution the Parliament is empowered to pass legislation for preventing environmental degradation. Besides, the parliament as a forum for public debate, can discuss various issues and problems of environment. The viewpoints expressed in the debates and discussions in the two houses of Parliament represent different perspectives on the problems of environment. They also represent the political elites' perspectives on Kaiga project. Here our assumption is that the members of the Parliament are political elites who determine the functioning of the Parliament to some extent. This would certainly help the environmental policy makers to understand the reality of environmental problems.
The debates and discussions in the two houses of the Parliament can influence the environmental policy making in two ways: 1) Advise of the members of Parliament; 2) Criticism of members of Parliament. In the process of debates in the Parliament the members offer advice to the government, or the environmental policy makers about the way in which the problems of environment can be tackled. This also involves suggestions of various possible alternatives to deal with a specific problem of environment. This contributes to select the best policy alternative to deal with specific problems of environment.

The criticism made by legislators in the two Houses of Parliament would certainly serve the purpose of forcing the environmental policy makers to reconsider or to rethink about their environmental policy decisions. The environmental policy makers may modify the environmental policy decisions or may ignore the criticism. However, this would refine the environmental policy decisions.

The advice and criticism of the legislators in the two Houses of Parliament would contribute to take sound environmental policy decisions. In this connection, it is very pertinent to refer to the debates and discussions held in the two Houses of the Parliament on Kaiga Project to understand the policy position of the government and the concern of the members of the Parliament about Kaiga Project.
In other words, this amounts to examine how the two Houses of Parliament contribute to the environmental policy making. In this regard, we found it difficult to identify the viewpoints of political parties on the basis of their concern expressed in the debates and discussions. Moreover the documents of the parties do not clearly state their position specifically on Kaiga Project. This led us to consider the concern of the legislators as the concern of the Parliament.

In spite of agitation against the Kaiga project, the construction work at Kaiga has been in progress. The Parliament has expressed its concern over various issues of Kaiga project. This can be understood on the basis of the debates and discussions in the two Houses of Parliament on the Kaiga project. The following issues of Kaiga project figured in the debates and discussions in the Parliament:

1. Site selection and location.
2. Expenditure on Kaiga.
3. Land acquired.
4. Environmental clearance
5. Rehabilitation
7. Disposal of Atomic waste and steps taken to prevent radiation.
8. Pollution and health hazards.
10. Fire Accident in Kaiga Project.
By the nature of the questions asked in the Parliament and the answers given, we can understand the concern of the members of Parliament and the position of the government on the Kaiga project.

When a number of questions relating to the approval of the location of Kaiga Nuclear project in Karnataka, its contribution to improve power situation in Karnataka, and the schedule of completion of work was raised in Parliament, the government stated as under:

1. That it has approved the location of Kaiga Nuclear Power station in Karnataka.
2. The two units are of standardised pressurised heavy water reactor type which use natural uranium as fuel and heavy water as moderator and coolant.
3. The two units when fully commissioned, will generate 470 MW of electricity.
4. The two ints are expected to be completed and commissioned by 1994.

But the Kaiga Project has not been completed as per schedule.

The government approved setting up of atomic power station in Kaiga in March 1985 with the target date of completing the project by 1994. But so far, the work has not yet been completed and the plant was not commissioned in time. In 1987, the government had promised in the Parliament to complete the project in the year 1995. The work at Kaiga is going slow and it appears that the project may not be completed even by 1997.
Reactors under construction at Kaiga

[Courtesy: The Hindu]
2. Expenditure on Kaiga:

Since the progress of the work was slow, members of Parliament sought clarification about the total expenditure of the Kaiga project. The members also asked if there was any proposal or possibility of foreign collaboration in this regard. Then government replied that civil works i.e., buildings at the Kaiga site in Karnataka had commenced in May 1988. Manufacture of long delivery equipment and setting up of infrastructural facilities at site were in progress. As regards the total expenditure likely to be involved, government stated that the sanctioned cost of the project was Rs. 730.72 crores and no foreign collaboration had been sought for this project.54

3. Land Acquired:

With the establishment of the Kaiga Nuclear Project, much of the forest area of North Canara district would be destroyed and also the project would adversely affect the bird species that live in the western ghat region. Therefore, the members of Parliament asked the government as to the total area of land acquired from the state government for the establishment of Kaiga atomic power plant and whether the union government had sought any report from the government of Karnataka regarding birds species that were likely to become extinct in the western ghat region of Uttar Kannada district. To this the government replied that the total area of land acquired from the state government for the Kaiga Atomic Power Project is about 1700 acres of land. This land would be adequate for future expansion upto
a total installed capacity of 2000 MWe. But in the newspapers and other reports it is wrongly stated that about 600-700 acres of land would be required for the setting up of the project. Such reports tended to create apprehension in the minds of the people. The government also stated that it had not sought any report from the government of Karnataka regarding bird species that had become or likely to become extinct in the western ghat region of Uttara Kannada District.\(^{55}\) This shows that the government has not paid much attention to preserve the species of birds likely to become extinct in the area. The environmentalists have made this an issue of their agitation against the Kaiga Project denudes the forest and threatens the existence of bird and animal species.

When a question seeking clarification whether were differences between the centre and the state government on setting up the project was raised in the Parliament, the government denied that no such differences existed.

4. Environmental clearance:

The anti-nuclear protestors are agitating against the establishment of Kaiga Nuclear project at Kaiga stating that the project destroys the environment of the rain forest of the region. Therefore, the government was asked whether the Ministry concerned had cleared the Kaiga nuclear power project from the environmental angle and whether the objections raised by the anti nuclear protestors against encroachment into rain forests
had been considered and if so, the decision there on. According to the statement of the Ministry of Environment and Forests, it had cleared the Kaiga nuclear power project from the environment angle and approval from the environmental angle had been accorded after careful consideration of all aspects of the impact of the project and no representation had been recieved from the anti-nuclear protestors by the Ministry of Environment and Forests.56

5. Rehabilitation :

For establishing Kaiga nuclear plant a number of families residing around Kaiga have been evacuated. They had to leave their home and land for the sake of the project. Therefore, the environmentalists and anti-Kaiga agitators protested against the project for evacuating the people. As regards this several times a number of members of Parliament expressed their concern and sought information regarding the total number of villages and the population going to be affected by this project and the steps taken for the rehabilitation of those people. According to the government, four villages consisting of about 150 families were affected due to the Kaiga Atomic power project. The compensation amount payable to the affected families towards land acquisition and rehabilitation had been deposited with the Karnataka State Govt. to enable them to rehabilitate the affected families.57
6. Employment opportunities:

Another question was raised on 9th Jan 1991 in the Parliament regarding 1) the number of persons who lost their lands due to Kaiga Nuclear Project; 2) out of these, the number of persons given compensation and employment so far; 3) the number of such displaced persons still awaiting employment and 4) the steps proposed to be taken to provide jobs to all the displaced persons. The reply of the government was that the total number of land affected families was 133, out of which only 85 families had been displaced due to setting up of the Kaiga Nuclear Power Project. Compensation amount determined by the Karnataka State Government was deposited by the Nuclear Power Corporation with the state Government and had since been disbursed to all affected families. The Kaiga project has so far employed 127 persons from the affected families including joint holders. Eligible applicants from land affected families available on the spot and certified by the state Government as project affected, have been given employment in the Kaiga project. Any additional requests of project affected families would be considered on merits and in accordance with the policy in this regard.58

7. Disposal of Atomic waste and steps taken to prevent radiation:

Disposal of atomic waste is another factor which has figured prominently in the agitations. They know the disposal of atomic waste is not easy and simple. There is no fool-proof method by which the waste can be disposed of because, the radioactive waste is powerful and will be emitting radiation.
If this radiation emits into or leaks into atmosphere it can badly affect the living beings and the environment. Therefore, prevention of radiation is a major challenge in the process of waste disposal. Hence, Parliament discussed about all possible precautions that have been taken in the disposal of atomic waste and the remedial steps proposed to be taken in the matter. The government believes that radioactive wastes are generally categorised into high, medium and low level wastes depending on their radioactive content. All these wastes are subjected to elaborate treatment and conditioning before they are stored in a safe manner. Only very low level wastes which are safe for disposal are discharged after making sure that they are well within the prescribed limits. Continuous environment monitoring is also ensured to make sure that proper health and safety aspects are taken care of. The government states that the nuclear waste is not expected to become a serious problem of waste disposal by the year 2000 and the technologies involved in the handling, processing and treatment of radioactive wastes are being constantly updated to keep pace with international development.59

Radioactive waste management is the main issue relating to nuclear power plants. The radioactive waste will continue to be active and its half life is for some hundreds of years. During this period the waste material will have to be properly guarded against leakages or else it will have a great impact in and around the environment of the Nuclear Power Reactors. Therefore, the Parliament discussed the details of steps taken for radioactive waste management in and around Nuclear Power Reactors in India.
In this regard the policy position of the government is that the technical and administrative feasibility to ensure a safe and efficient system of radioactive waste management at a particular site is an important consideration at the siting and designing stages of nuclear reactors. On the basis of elaborate and extensive investigation with respect to prevailing environmental conditions at a particular site, appropriate limits are established for safe release of radioactive wastes. Liquid radioactive effluents are treated so that all the radioactivity is retained in concentrated form and segregated from the environment in order to ensure that release into environment is below permissible limits. Gaseous effluents are also subjected to effective treatment before release into atmosphere within permissible limits. All types of solid wastes are suitably conditioned prior to their storage in the high integrity engineered containments. In addition, there is a continuous programme of surveillance and monitoring in and around nuclear power reactors to guard against unlikely event of any uncontrolled spread of contamination. The government also stated that the technical knowhow for management of radioactive waste is not imported since, India has a very high level of competence in management of radioactive wastes.60

8. Pollution and health hazards:

The Nuclear Power Plants cause a number of health hazards to people and animals. They affect the living beings in a number of ways. Therefore, the elites and the environmentalists have educated the local people about the hazardous effects of Nuclear power Plants. Hence the people in and
around Kaiga being afraid of Kaiga Nuclear Power project, joined hands with the agitators in opposing the Nuclear Power Plant. The nuclear scientists strongly argue that they have taken adequate precautions to contain the hazardous effects of Kaiga on health of the people.

With regard to this, a discussion in the Parliament took place. In this discussion the issue of precautionary measures taken to safeguard against health hazards in that area, the steps taken to convince the people of that area about the safeguards provided figured prominently. Then the response of government was that the precautionary measures have been taken to safeguard against health hazards and the public are being reached through exhibitions and lectures by experts and the inbuilt safety systems/measures are being explained to the people.61

While the elite and the environmentalists hold the view that the Kaiga Nuclear Power Plant is dangerous and harmful, the Nuclear Scientists on the other hand say that Kaiga is safe and all precautionary measures have been taken to prevent any disasters.

Regarding this the govt. was asked (i) whether the recent dialogue between the country’s top Nuclear Scientists and different environment groups from Karnataka tried to thresh out the controversy over the Kaiga Power Plant; (ii) whether the local people had their apprehensions and misgivings about the possible pollution hazards and (iii) whether the matter
had been resolved to their satisfaction. The government replied by stating that a meeting was convened by the Chief Minister of Karnataka at Bangalore on 25th October 1985 when the Chairman, Atomic Energy Commission, the Chairman, Nuclear Power Board and other senior officials of the Department of Atomic Energy discussed various issues raised by representatives of environmental Groups.

The government accepted that the local people had their apprehensions and misgivings about the possible pollution hazards. Further it stated that the details of safety approach adopted in Nuclear Power Plants and various measures to prevent environmental pollution were explained in the meeting and the apprehensions and concerns expressed by the environmental groups were clarified with technical and other details.62

Those in favour stated that the Kaiga Project is safe, clean and cheap. But those who opposed stated that Kaiga project is not safe, clean and cheap particularly from the point of the life of the people. Because if there is radiation it will result in the death of the people living in and around the project area. It was also stated that the project was not clean from the point of environment also. In order to establish the project the ever green forest has to be destroyed, which provides the means of livelihood to a number of people and is also a source of heavy rainfall. Even after establishing the project the danger and damage to the forest and the environment will not be overcome. When the project is commissioned
it releases wastes known as radioactive waste, in the form of gas, liquid and solids. Hence, the plants and living species in land and water get affected adversely. The Nuclear Power Project is not cheap also as claimed by the Nuclear scientists, because, the expenses for the decommissioning of the Nuclear plant are not taken into account. If the decommissioning expenses are also calculated, the Kaiga Nuclear Power Project would not certainly be a cheap project. In the light of such circumstances two opposing and controversial viewpoints exists with regard to the Kaiga project. While the Nuclear scientists justify the completion of the construction of the Kaiga project in all respects, the opponents of Kaiga maintain that the project will create hazardous effects on human and animal life as also on vegetation of the area.

9. Collapse of the dome:

The inner dome of the Kaiga Nuclear Plant collapsed on 13th May, 1994 giving rise to a number of doubts and questions. In this connection a general discussion was held in the Parliament in regard to such questions as to:

a) whether fresh environmental clearance has been granted for reconstruction of the collapsed dome.
b) if so, the details there of;
c) whether any study has been made in regard to its adverse impact on environment;
d) if so, the details there of; and
e) if not, the reasons therefor?
The government replied that fresh environmental clearance was not required for reconstruction of the inner containment dome of Kaiga unit I, which will be taken up after the Atomic Energy Regulatory Board gives clearance on completion of the investigation of the failure of a part of the dome. Further the govt. made it clear that the project is still under construction stage and no nuclear fuel or heavy water has yet been transferred to the site. As such there is no need to initiate comprehensive study regarding adverse impact on environment.63

10 Fire Accident in Kaiga project:

In the Kaiga Nuclear Power Plant there were also fire accidents. These accidents may cause damage to the Nuclear Power Plant and threaten the life of living beings. Hence the Parliament discussed the matter. It was reported that a fire accident occurred on 31st May 1994. There were also some very minor localised fire incidents outside the buildings, involving grass, cotton waste etc., These fires were extinguished immediately without any harmful consequence. According to the govt. the Kaiga project is fully equipped with adequate fire fighting facilities such as two fire tenders, fire fighting crew of about 40 personnel and other necessary fire fighting equipment and all fire accidents including minor ones are analysed and preventive action is taken by the committee constituted at the Kaiga project for this purpose.64
The govt. was also asked about the progress made so far on the Kaiga Project and whether the government have any proposal to increase the capacity of the project by sanctioning more units. The government replied to say that Kaiga Atomic Power Project with two units is under construction. Site infrastuctural works and main plant civil works are in progress. The manufacture and deliveries of major equipment and components are progressively effected. And also, it is proposed to add four additional units each of 220 MWe capacity (Kaiga 3 to 6) at the same site.\textsuperscript{65}
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