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**Nuclear power an efficient alternative**

It is generally assumed, especially among international experts, (to some extent in Pakistan also) that Pakistan established its nuclear program just to develop atomic weapons.

Yes, Pakistan had developed nuclear weapons because of the existential threat from India. Otherwise, during the 1960s the sole purpose of Pakistan’s nuclear program was to meet the future needs of its energy demands. Like many other countries in the world, at that time Pakistan only wanted to use nuclear technology for peaceful purposes.

This story about the peaceful use of nuclear power started in the 1950s when Western countries started developing their ability to produce electricity by using nuclear power plants. In 1953, the US initiated its atoms for peace programs to help third-world countries meet their energy demands. As an active member of the international community, Pakistan also developed a working relationship with other countries to use this new invention for the betterment of its people.

To achieve this, Pakistan established the Atomic Energy Commission 1956. As a result, it raised its first nuclear power plant with the help of a Canadian firm during the 1960s. Named KANUPP, it started producing electricity by the end of 1972 with total power generation of more than 100 MWe. This marked a distinguished year in the history of Pakistan because it joined the club of the few countries that were producing electricity by using nuclear reactors.

Despite so many constraints, slowly and gradually, Pakistan raised four nuclear power plants at Chashma – Chasnupp 1, Chasnupp 2, Chasnupp 3, Chasnupp 04. All these nuclear reactors are now collectively producing 1435 MWe of electricity. Besides this, Pakistan also has two more nuclear power plants in Karachi – K2 and K3 – and they will start producing collectively more than 2000 MWe of electricity till the end of 2021.

Pakistan is not the only state that is working to produce electricity from nuclear reactors; more than 30 countries in the world are using nuclear power plants to produce electricity. Today, around 10 percent of total electricity that is produced in the world is from the 440 nuclear power plants. Nuclear power plants are now the fourth-largest producer of electricity in the globe, and their total production is more than 2563 TWh. In France almost three-quarters of electricity is produced from nuclear reactors; power plants that were generating electricity by using fossil fuels were converted to nuclear power in just 15 years. Today twelve countries in the world are getting three-fourths of their total electricity demand from nuclear power plants.

Even though many countries in the world are now using nuclear energy, it is still common rhetoric that nuclear power plants are prone to fatal accidents. But the reality is that nuclear power plants have proved safest than all other forms of energy producers. The world has now been using nuclear power plants for the last sixty years and we have seen only three incidents in these years so far. In the Chernobyl incident in 1986, 31 people lost their life directly and it affected many others. The Three Mile Island incident reported only one casualty while in the Fukushima incident there was no loss of life. If we compare with other sources of energy production, the numbers increase to more than half a million a year by a different type of accident in power production

This ever-growing dependence on nuclear energy has very positive effects on the future of humanity. The first and most important advantage of using nuclear energy is that it is environment friendly. The world is facing catastrophic events like floods and droughts due to climate change. Pakistan is also among the countries that are seriously affected by environmental degradation. According to a report by the Intergovernmental Panel on Climate Change, to reduce the effects of global climate change and achieve the 1.5 C goal, a major reduction in the emission of greenhouse gases is needed.

Nuclear power plants, with a very low level of carbon emission, can provide an excellent source for producing clean energy to meet future demands. As Pakistan is a member of the Paris Treaty on climate change, and it is among the countries which are most affected by climate change, nuclear energy could provide a peaceful alternative to Pakistan growing energy demands. It will also not jeopardize the efforts of the world community toward a clean atmosphere.

Second, nuclear energy is the most reliable source of energy, while other power generation plants are controlled by external factors to produce electricity with their full potential. For example, in the case of a wind power plant, it depends on the time of the year when there is a heavy wind blowing. Solar energy production depends on clear weather. Other power plants that are run by coal or natural gas are less productive because of the need for continuous maintenance and refueling. In the case of a nuclear reactor, refueling is done after a long time. KANNUP 1 which was established in 1972 in Karachi is still working with maximum production. It was done even within the constraints imposed by the world community. Last but not the least, having a robust civil nuclear program can help any country to enhance its national security.

Like most of the global south states, Pakistan is already facing a gap between its electricity supply and demand. The country’s huge dependence on oil and gas is already playing an important role in the price hike of electricity. On the other hand, Pakistan was not able to build major dams. Pakistan's energy demands will increase at a rapid pace due to the $46 billion China-Pakistan Economic Corridor project Therefore, nuclear power plants could provide Pakistan with a better source of energy in the coming future.

Pakistan already had 48 years of experience in producing electricity from nuclear power reactors. Due to hard work and proper institutional frameworks, not a single major accident has been recorded so far. It is already planned that Pakistan will increase its energy production from nuclear reactors to 8800 MWe by the end of 2030. This power production from nuclear reactors will reach 40,000 MWe till 2050. But to accomplish these goals, the government should establish a proper institutional structure with an adequate amount of funding. If these goals are achieved, Pakistan will never face an energy crisis again which will eventually result in the socio-economic uplift of the nation.

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