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# Evolution Of India's Nuclear Program

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***Abstract***
*The purpose of the research examines the evolution of India's nuclear program as it developed from the 1940s by a small group of influential scientists and the current nuclear capabilities that they now posses. The Indian nuclear program continues to develop improved weapons technologies and economic development with the potential to proliferate nuclear material. India since 1947, in order to develop a comprehensive strategy that utilizes all the instruments of national power that will encourage India to become a responsible stakeholder among the nuclearized countries and demonstrate the responsibility that goes along with nuclear technology. India's nuclear policy was also influenced by India's international security condition as well as by domestic variables such as the vagaries of political change and the influence of bureaucratic elites. India aspired to be a nuclear state after 1962 conflict with China, particularity after China conducted its first nuclear test in 1964 The role of 'the nuclear' in global power status however is central to being recognized as a power to be reckoned with. Despite India's nuclear tests in 1974 and 1998, such recognition had always eluded India. Since India was not a signatory to the NPT.*

***Keywords:-*** *Non-proliferation, India, United States, Nuclear, Strategic*

**Introduction**

India is **showing** a new image of itself to the world and the world is recognizing that today, India is indeed a country to be imagined with. 65 years on, Jawaharlal Nehru's dream of India being recognized as a global power has been closer. India always aspired global recognition, however for almost half a century India was seen as overpopulated, poor and irrelevant. Although the hegemony in the South Asian region and a leader within the Non Aligned Movement this hardly mattered on the wider world stage. India's nuclear policy after independence was very flexible and reactive in nature. The global vision engendered by Nehru was based on moral supremacy and leadership of the developing world as well as economic self sufficiency at home. These moral principles focused largely on issues of superpower domination, nuclear weapons and anti-imperialism and were passed on from government to government from independence. However as the world around India changed these principles slowly became obsolete.

India aspired to be a nuclear state after 1962 conflict with China, particularity after China conducted its first nuclear test in 1964. India carried out its first nuclear detonation a "peaceful nuclear explosion," on May 18, 1974. This test code named "Smiling Buddha" was conducted in the western parts of India over a dessert terrain at a small village called Pokhran. Since then this test has been mostly known as Pokhran-1 and it had demonstrated a yield of perhaps 12 Kilo Tons (kT) (Ajey Lele:2013). On May 11, 1998, India tested three devices at the Pokhran underground testing site, followed by two more tests on May 13, 1998. These tests include fission device with a yield of about 12 kT, a thermonuclear device with a yield of about 43 KT, and a sub-kiloton device. (Ajey Lele:2013)

The realization that global power, nuclear power, security, energy policy and economic growth are linked has led to a new nuclear policy formulation. New Delhi's priority today is to protect India's security, economic growth and foreign policy has been harnessed to create linkages with those countries that could provide nuclear energy security. This is because India sees that the only way it can maintain its' current position on the global scale is through its growth.

India is a nuclear state because of the complicated security milieu in the sub continent. Understanding the dangers of nuclear weapons and the type of paranoia they could create both regionally and globally, India has by design adopted a policy to restraint which involves minimum deterrence and not first use as the two vital pillars of its nuclear policy.

This paper aims to draw together the evolution of India's nuclear program economic growth and the quest for global power status. It will give a brief background to India's nuclear power program and analyze its developments.

**Origin and development of new nuclear policy**

India, nuclear weapons and energy development began with the both objectives of attaining world power and improving the quality of life of the people and self-reliance in meeting their energy needs. Although the foundation of Indian nuclear programme was laid on the 12th March 1944, (Naeem Ahamed Salik:n.d), it was a tentative attempt. The origin of the

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atomic energy programme in India after independence, India started with its nuclear programme headed and can be traced unambiguously to a remarkably bold initiative taken by Homi Jehangir Bhabha under the Atomic Energy Act (AEA) of 1948 focusing on peaceful development (Ajey Lele:2013). He proposed setting up of a rigorous school of research in fundamental physics for this purpose. Bhabha prophesied that a completely self-reliant power programme would come about within two decades. On 10th August 1948, the Government of India constituted the Atomic Energy Commission (AEC), under the Atomic Energy Act to establish the atomic energy programme. One of the first tasks of the Commission was to explore the availability of raw material resources within the country. As AEC was setup in 1948, in the nearly years, India assumed a categorical anti- nuclear weapon position. This phase did not last long. On 3rd August 1954, the Department of Atomic Energy (DAE) was established. Immediate effort was to develop key elements of infrastructure for a nuclear power programme. All scientists and engineers engaged in the fields of reactor design and development, instrumentation, metallurgy and material science, etc. A strong pro-nuclear weapons lobby emerged in India in the 1960s. The rise of the lobby was due to two reasons. Firstly, the humiliating defeat of India in her border Sino-Indian war with China in 1962. Secondly, China's detonation of its first nuclear bomb in 1964. China's nuclear explosive test, following on the heels of her victory over India, increased India's insecurity. This insecurity among other factors motivated India's nuclear weapons program.

Indian official stance is that its nuclear research and development programs are intended for peaceful purposes only. But in reality, Indian nuclear program has an aggressive purpose. US intelligence agencies contend that India has all the components necessary to make nuclear weapons, within hours if necessary. Moreover, India itself denies possessing a nuclear arsenal.(Zachary S.Davis:1994) India's capability of making a nuclear bomb is due to its extensive nuclear infrastructure. Currently, the infrastructure consists of 9 power reactors, 8 heavy water plants, 4 plutonium reprocessing plants, 2 uranium enrichment facilities, 9 research reactors, and 1 fast breeder reactor (Pervaiz Iqbal Cheema:1995-96). Further, twelve power reactors, four heavy-water plants and two plutonium reprocessing plants are planned for future development of its nuclear program. (Pervaiz Iqbal Cheema:1995-96). It is estimated that if its existing reactors operate at full capacity, they can produce 360 kilograms of plutonium per year. In brief, India may produce approximately 50 nuclear devices within a year(Zachary S.Davis:1994). Due to these capabilities, India falls into a category between the five declared Nuclear Weapon States (NWS) and nearly all other states, which have renounced nuclear debate. Thus, India should be termed as 'a nuclear threshold state'. Moreover, since its "peaceful nuclear explosion of 1974, India is considered as a defacto member of the nuclear club.

India's attitude towards the present Nuclear Non Proliferation Regime (NNPR) is negative. It has resisted a number of non-proliferation initiatives by other states. It refuses to joint Non Proliferation Treaties (NPT) as well as Comprehensive Test Bend Treaties (CTBT). It has dismissed almost all regional nuclear as well conventional arms control measures proposed by Pakistan. It argues that, it is willing to participate in a nuclear restraint regime, but only if it is non-discriminatory and takes into account India's security concerns vis-à-vis China.(The Asian Socity:1994). The following part of the discussion will elaborate three factors. The identification of the perceptions and priorities which have formulated the Indian nuclear policy. Secondly, the development of Indian nuclear program and finally the Indian approach towards the NNPR.

**Factors Responsible for Indian Nuclear Program**

There are four major factors which compel India to go ahead with its nuclear program. They are almost the same that led the US, former USSR, UK, France and China to undertake absolutions nuclear program. They are:
(a). Security Considerations
(b). Political prestige and Influence
(c). Economic benefits, and
(d). Domestic Compulsions

**(a) Security Considerations**
Defense policy of a state is based on a number of calculations and considerations. These include, among other things, the geographical location and relations with the neighboring states, the power structure in the regime, real or imaginary threats to its territorial integrity and the role which political elite like state to play in future. India's geographic proximity to communist Beijing has also been problematic. India's defeat in the 1962 border conflict with China proved its military unpreparedness and exacerbated tensions between the two countries.( George Perkovich:1999) Two years after the conflict, China tested a nuclear weapon, making Indian politicians question the wisdom of their nuclear policies. (Joyce Battle:n.d)

In case of India, its border with Pakistan and China are not secure. Its relations with these neighbouring states are tense, especially with Pakistan. Recently, Sino-Indian rapprochement has started. Both states initiated moves in 1996 to reduce this tension. But these positive developments between India and China are not enough for India to ignore China in its defense posture. India has increased its defense budget by 8% for the year 1996-1997 (Dawn:1996). In fact China and India are locked in a struggle for leadership within the developing world, especially Asia. India is a big power of South

Asia. But Pakistan denies its big brothers role in South Asia. China is viewed as the supporting element of Pakistani defense infrastructure. Therefore, Indian pro-nuclear lobby, insist on the Indian government to manufacture nuclear weapons to keep India at par with China. They link issues such as, Sino- Indian war of 1962, china as a nuclear weapon state and china-Pakistan friendship since 1962 and Chinese support to Pakistan in indo-Pakistan war in September 1965 etc, to convince the world in general and the public in particular that the existence of India as sovereign state has been at stake. Ram Chandra Bade, Jan Sangh Parliamentarians, said in Lok Sabha on March 23,1963, "only those who wish to see Russian's or Chinese ruling India will oppose the development of nuclear weapons. (Akhtar Ali:1984).Nuclear hawks in India think that only nuclear weapons have ability to solidify India's defense.

Nuclear hawks have pleaded for an independent nuclear armory to check China's possible blackmail of India. They argue that the problem of high cost of production of nuclear weapons could be met by reducing expenditure on conventional forces (Ziba Moshaver:1991). This school of thought has rejected the concept of collective security. They argue that super powers did not ever come to rescue India, rather supported those states, where their own existence was threatened. India, if she has to safeguard her national interests, ought to materialize its nuclear weapons option. They plead for sovereign deterrence. Dr Homi J Bhabha opined in his paper presented to the 12th Pugwash conference in January 1964. In the "conventional weapons could only provide relative deterrence while nuclear weapons give absolute deterrence" (Ziba Moshaver:1991).Eventually, the nuclear hawks succeeded in convincing the Indian parliamentarians. The notable point here is that parliamentarians from different political parties have identical view over the use of nuclear technology. For example, during 1965 war, over 100 members of the Indian parliamentarians belonging to the Congress, the PSP, the Swatantra Party alongside the independent members urged the government to develop its own nuclear deterrence. The statement said"… India's survival both as a nation and a democracy in the face of the collusion between China and Pakistan, casts a clear and imperative duty on the government to take an immediate decision to develop our nuclear weapons (Hasan Askari Rizvi:1975)

**(b) Political prestige**

India considers itself as a preeminent power of South Asian region. It has ambitions to play a much wider role than just being confined to South Asia. Due to its great number of population and territorial size, it sees itself as the natural successor to the British colonial heritage in South Asia. This vision compels the Indian ruling elite that India must play a dominant role in the developing countries of Asia and Africa. This was reason, on account of which India became one of the pioneers of the Non-Aligned Movement. India considers nuclear device a tool of becoming a major power. The nuclear hawks quote that US did not recognize China till it became important for US once it demonstrated its nuclear device. Therefore, if India became a nuclear power, definitely it will earn more respect in the international system.

Nuclear weapons are also viewed by the less developed states as symbol of modernization. They believe that nuclear device would make them able to influence some international events in their favour. The Indian case is perhaps the clearest demonstration of this nationalism. One finds a rallying point: "Build the bomb! the bomb means power" (Pervez Hoodbhoy: 1994).

**C) Economic Factors**

India is a highly populated state. It is passing through the process of urbanization and industrialization. India's energy requirements need, it is argued, could be met only by nuclear energy for power energy generation. The outstanding feature of nuclear energy is that a pound (45gms) of uranium is equivalent to 1,500 tons of coal, 25,5000 galllons of fuel oil or 40,000,000 cubic feet natural gas (Dr Maqsood:1991). Coal and hydel sources are India's most extensively utilized power resources but both have inherent limitations.

The problem with the sources of hydel power generation is that sources of hydel power generation are located at places remote from industrial centers. Moreover, the flow of water in many of the rivers is dependent on the monsoon rains. India's coal resources are concentrated in the eastern region. Transportation of large quantities of coal from places of extraction to power stations involves enormous expense. It is claimed that regions which are more than 1,300 km away from coal mines may not be served economically by coal source(G.Mirchandam:1981). Therefore, use of nuclear technology for power production will be more efficient in these areas.

Agriculture is an important sector of the Indian economy. Nuclear radiation techniques have been found quite effective in overcoming some major problems in the agriculture sector. Another simple but very useful application is in the quality control of many industrial products. Radio-isotopes can be used to ensure uniformity in the thickness of varied materials such as sheets of paper, cardboard, plastic or metal. Moreover, radio-isotope traces help in studying the movement of underground water or sand and salt and in the medical field as well.

**(d) Domestic Compulsion**

For understanding the domestic pressure in the nuclear field, one has to look at upon all sections of Indian society. Scientists are one of the most powerful pressure group within the Indian society. They advocate the manufacture of nuclear devices. Large number of Lok Sabha members regularly asserts that India should nuclearise its weapon program. Since

1964, the nuclear issue has become an integrate part of public discussion. The common man is in favour of nuclear weapons. The public nuclear debate has been extension of one which had begun privately much earlier in the inner bureaucratic circles. The inner debate had been initially confined largely to the nuclear scientists, civilian intelligence personnel and the Indian foreign office. Their strength was not very large. But their influence spread with the passage of time (Jozef Goldblat:1985).

The pro-nuclear weapon element increased with the change in political leadership. The younger generation of leaders rising in 1960s along with Indira Gandhi in the Congress Party and the younger activities in the socialist parties were in favour of the nuclear option advocating it openly (Jozef Goldblat:1985). The political parties derive political objectives from nuclear issue. The party in power advocates the acquisition of nuclear weapon status. By this they distract public attention from pressing and undesirable internal development. It is strongly argued that high visibility of technological achievements can divert the anticipated public wrath and buy sufficient time for government.

In fact in India, since 1962 there has been only a fraction of public option, which was not carried by emotions. The majority has no sense to realize that Chinese explosion of 1964 was not aimed at India. The Chinese explosion was to improve its position, vis-à-vis, the US and the former USSR. It was directly related to the question of China's status as a world power and to claim her rightful place as a permanent member of the Security Council. The Indian fears that China would use nuclear weapon against her do not make any sense. China did not need nuclear weapons for defensive purposes vis-à-vis , India. The conventional military force at her disposal has been enough to defeat India. (Hasan Askari Rizvi:1975). But, pro-nuclear lobby in India always argued that china's nuclear weapons can be used against India. Due to this propaganda, the common man in India now think that India's sovereignty is directly link with its nuclear weapons option in the past the government of India has always tried to sell Chinese phobia to major powers for some benefits. For example, in the late 1960s when negotiations were underway for the NPT, India had refused to joint attempting to seek a "Special Case" status, in view of described areas from China. These sorts of attempts by Indian government have strengthened the decision for nuclear weapons in the minds of the common man. At present no political party or government can rule out the nuclear weapons option. If they did, the public would oppose their decision and caused a political unrest.

**Indian Nuclear Program**

In identifying the first attempts by India to begin a nuclear program, Guarav Kampani in his work Nuclear Overview: Historical Overview as promoted in NTI identifies these first attempts as "India's nuclear program was conceived in the pre-independence era by a small group of influential scientists who grasped the significance of nuclear energy and persuaded political leaders from the Indian National Congress to invest resources in the nuclear sector."( Guarav Kampani:2007)

As mentioned earlier, India's nuclear program was initiated much before its independence, introduced by the personal efforts of Dr Homi J Bhabha, who managed to establish the "Institute for Fundamental Research" with the assistance of Sir Dorabji Tata Trust. Dr Bhabha wrote to the Trust declaring that: "When nuclear has been successfully applied for power production, in say a couple of decades from now, India will not have to look abroad for its experts but will find them ready at hand". (George Perkovich:1999)

India has dual policy regarding its nuclear program. Though it claims that its nuclear program is for peaceful purposes, it has never ruled out its application for military use. In June 1946, Jawaharlal Nehru said; "I hope Indian scientists will use the atomic force for constructive purpose. But if India is threatened, she will inevitably try to defend herself by all means at her disposal". From the early days of independence, Indian leaders, especially Jawaharlal Nehru, took a very public and very vocal stand against nuclear weapons. But Nehru, a modernist, was also convinced that nuclear technology had a role to play in national development (Itty Abraham:1998)

The development of Indian nuclear program can be divided into three phases. In the first phase, the main focus was on the establishment of infrastructure and the peaceful use of nuclear technology. The second phase highlights change in the nuclear policy of India. Third phase confirmed that India was able to make nuclear devices.

**First Phase-Nehru Era**

The Indian government passed the Atomic Energy Act in 1948. By virtue of it, Indian Atomic Energy Commission was set up in August 19, 1948, with Dr Bhabha as its Chairman (Norman Brown: 1972). In 1954, India set up a multi-disciplinary centre for nuclear research and development at Trombay which is now named after its founder as the Bhabha Atomic Research Centre, which has grow from modest beginnings to become the premier institution of science and technology in the country. The first major project of this centre was the construction of APSARA, a pool type reactor, built with British assistance in 1955. This was only the first step as after long negotiations, Canada agreed to provide India with the 40MW Canada-India Reactor (CIR),( M.V. Ramana:2007). . "Conducting this transition was made easier

by the construction of India's first reactor, the 1Mega Watt Aspara Research Reactor, the Canada-India Reactor, U.S, or CIRUS, with Canadian and US collaboration which started functioning in 1960. Acquisition of CIRUS was a turning point for India's nuclear weapons ambitions. The reactor's design was ideal for producing weapons-grade plutonium. CIRUS produced the plutonium used in India's first nuclear test in 1974 (.Baker Spring and Dana Robert Dillon:2006). . Although U.S. cooperation on the CIRUS project was granted on the understanding that the reactor would be used only for peaceful purposes, there were no international safeguards available to regulate and verify the use of transferred technology. Subsequently India indigenously constructed two additional research reactors, which went into operation in 1961 and 1972 respectively(Mirchandni:1981). The US and India signed an agreement for the infrastructure of Tarapur Atomic Power Station in 1963(Ashan Ali Khan:1982). The significance of the U.S. agreement to supply heavy water is that this provided an additional conduit for the production of plutonium and allowed India to bypass the uranium enrichment process that would have been necessary to develop nuclear weapons. By allowing this transfer of heavy water to occur in 1955, the U.S. must ultimately bear some responsibility for the nuclear tests that subsequently occurred in 1974.

In the late 1950s and 60s, India pursued what Nehru insisted was a "peaceful nuclear program," meaning that their program was not developed to construct nuclear weapons, but instead to provide energy for the populace. During the 1960s, changes began to occur within India that sparked the development of nuclear weapons. Prime Minister Nehru, although advocating disarmament, was apprehensive about China's nuclear weapon program. Upon his death, India began to develop the program to counter the Chinese program and its subsequent testing in 1964. (Joyce Battle.:2008) This also evolved as a result of the 1962 war with China, which altered the Indian view of nuclear weapons. "In a real sense, this war began the process that culminated in the Indian nuclear tests of 1998."( John W. Garver:2001)

**Second Phase-Post1964 Era**

The late Prime Minister Nehru maintained his commitment practically during his era, india was concerned with the peaceful uses of nuclear technology. But soon after Nehru death, and just five weeks later the first nuclear test by China (1964) his successor Lal Bahadur Shastri, diluted the commitment. The new Prime Minister said that "I cannot say that the present policy (for nuclear pacifism) is deep rooted, that it cannot be set aside and that it would not be changed".(Bhabhani Sen Gupta:1983),. Here the irony is that even India, the apostle of world peace, had to keep the nuclear weapons option open.

The powerful group of nuclear hawks emerged during this phase. They belonged to different discipline of life. Fingers such as K.Subrahmanyam, Raj Krishna, Sisir Gupta, Y.B.Chavan and Vikram Sharabhai supported india's nuclear weapons program. They successfully shaped public opinion in favour of developing the bomb in 1968, 79 percent of the Indian supported the nuclear option in opinion polls (Chris Smith:1994).

A reprocessing plant for the separation of plutonium at Trombay was inaugurated in 1965. This was the first plant of its kind which established outside the nuclear weapons states. This indigenously constructed plant provided India with both reactor fuel and explosive material (Naeem Ahamed Salik:n.d). When the Indian scientists started work on it, they had been aware of the dual purposes for which plutonium could be used.

**India's Nuclear Explosion**

The most significant feature of India's nuclear development is its "peaceful nuclear explosion", which was conducted on May 18, 1974. The explosion with a blast power of 10-15 kilotons was carried out at a depth of hundred meters. Plutonium was used as the fissile material. The blast created a crater of 150 meters in diameter (Naeem Ahamed Salik:n.d). The explosion was the logical outcome of the change in nuclear policies first hinted by Shastri in November 1964 (Shyam Bhatia: 1979). The test was described by Indian officials as a "peaceful nuclear explosion" (PNE). Prime Minister Gandhi went further emphasizing "that the new nuclear know-how and technology would contribute to India's development, even if the economically advanced nations would suggest otherwise." (Perkovich:1999).

International reaction to the Indian PNE was at first mixed. The countries belonging to the non-aligned movement applauded the competence of the scientists and technologies that had enabled the test to be conducted. France sent congratulatory messages to the Indian Atomic Energy Commission. The United States acted swiftly, imposing restrictions on India that were designed to limit India's access to nuclear material and technology, thereby attempting to slow down India's nuclear ambitions.( Virginia I. Foran:1999).

The effects of this PNE were mixed in India as scientists desired to continue testing and the government, facing competing domestic priorities and international considerations began to back away from the continuation of testing. (Perkovich:1999).

India faced dramatic, complicated strategic problems from 1980-84. U.S. aid to Pakistan in the Afghan war and Pakistan's advancing nuclear weapon program created the kind of external environment that would call for increasing the nuclear arsenal. Despite pressures from the nuclear establishment and rising military voices urging the acquisition of nuclear weapons, Gandhi refused to authorize another nuclear explosive test or other measures to weaponize India's nuclear capability.

Much of the Indian debate about nuclear weapons between the 1960s and the 1990s did not consider how nuclear weapons might be used within the framework of Indian strategy. The arguments and propositions largely revolved around whether India should go nuclear, not what India should do with nuclear weapons.( Waheguru Pal Singh Sidhu:2004) It was only in the 1980s that some Indian strategists such as K. Subrahmanyam and General K. Sundarji started writing about what nuclear weapons might be useful for. This view of the political utility of nuclear weapons is also reflected in arguments about nuclear weapons providing political space and strategic autonomy, arguments that former Indian Foreign Minister Jaswant Singh has made. Not surprisingly, the eventual Indian nuclear deterrent emphasized small numbers and a capability to retaliate, rather than building a deterrent force that would have parity with other nuclear powers.

A significant aspect of India's decision to build the bomb was pride. "We don't want to be blackmailed [...]. Nuclear weapons will give us prestige, power, standing. An Indian will talk straight and walk straight when we have the bomb," a BJP spokesman said in 1993. (Perkovich George:1998). Another motivation for developing nuclear arms was living next door to nuclear-armed China and nuclear-aspiring Pakistan. In 1996, BJP leader Atal Bihari Vajpayee vowed not to compromise India's national sovereignty and security: "We do not wish to see India blown apart by Pakistan or China because we did not possess the deterrent nuclear power." (Krishna M. Bhatta and Mahesh Mehta:n.d) It was Vajpayee's party that authorized two rounds of nuclear tests in May 1998.

After 24 years, India surprised the world once again by conducting three nuclear tests on Buddha Poornima Day--May 11, 1998. One was a plutonium type similar to the 1974 test. Another was a thermonuclear or hydrogen bomb, and the third one was a low yield device with a wider application--primarily a tactical weapon. All three devices were triggered by one pull.
Two days later, on May 13, 1998, another two weapons were tested at Pokhran. These tests gave Indian scientists up-to-date knowledge on the latest developments in weaponisation of nuclear technology, including an ability to conduct sub-critical tests or testing by computer simulation in the laboratory.

Prime Minister Atal Behari Vajpayee later said: "India now is a nuclear weapon state."(Times of India:1998) Brijesh Mishra, the Prime Minister's Special Secretary, also said after the May 11 tests: "These tests have established that India has a proven capability for a weaponised nuclear programme."(Times of India:1998) R. Chidambaram, Chairman, and Atomic Energy Commission, stated: "The bombs tested at Pokhran were purely for defensive purposes." This time there was absolutely no reference to any peaceful nature of the nuclear tests.

India's declaration of itself as a nuclear weapon state was seen by the Western powers as an effort on its part to emerge as a major power. The American policy makers were particularly sharp in advising India that there is no linkage between major power status and the possession of nuclear weapons. US President Clinton said that with India's democratic traditions, the nuclear path is not a way to "greatness."(Times of India:1998) In the view of his Secretary of State, Madeleine Albright also, nuclear weapons will not help a country "to enhance its national strength and status."(Times of India:1998).

In 1989, William H. Webster, director of the CIA, testified before the Senate Governmental Affairs Committee that "indicators that tell us India is interested in thermonuclear weapons capability." (William Webster:1989).Once the decision to produce the bomb was made, India progressed quickly, especially during the periods when Hindu-nationalist Bharatiya Janata Party (BJP) was in power. By May 1994, the country acquired the capability to deliver nuclear weapons using combat aircraft. By 1996, Indian scientists succeeded in developing a nuclear warhead that could be mounted on to the Army's Prithvi-1 ballistic missile.

Robert Norris and Hans Kristensen estimate the Indian arsenal to consist of 70 assembled nuclear warheads, with only about 50 fully operational.( Norris, Robert S.; Hans M. Kristensen:n.d) India has a declared nuclear no-first-use policy and continues to advocate the end to nuclear testing and global disarmament "based on the principles of universality, nondiscrimination and effective compliance." The country is a member of the International Atomic Energy Agency (IAEA), but only four of its 13 nuclear reactors are subject to IAEA safeguards. However, India has not signed the Comprehensive Test Ban Treaty (CTBT) or the Non-Proliferation Treaty (NPT).

**Current Nuclear potentiality of India**

India currently possesses a strategic weapon capability that includes both air-deliverable nuclear weapons and ballistic missiles and is continuing to develop more sophisticated long range ballistic missiles. India has developed "the most

ambitious missile programme in the developing world."(David J Creasman:2008) India has an extensive, largely indigenous ballistic missile program involving both SRBMs and MRBMs, which has progressed considerably over the past several years. This development program includes two significant types of missiles currently in its arsenal, these three are: "the Prithvi SRBM and the Agni." (David J Creasman:2008).

Prithvi has developed four different range and capabilities, the range from 150km to 750km. The second missile system is the Agni, a medium to long range ballistic missile that is believed to have a range of up to 2,500km and was first tested in 1989. There are several variants of the Agni in service, with several more in the testing stages of production at this time. The first missile, the Agni I is "a solid/liquid fuelled two-stage road-mobile ballistic missile that has a nuclear-warhead capability for the army. The missile range is estimated at 860km with a payload of 1,000kg. "The Agni II has an estimated range of 2,500km and a payload of 1,000kg." (David J Creasman:2008).The Agni III, the third missile is the heaviest of the Agni series and has an estimated range of 3,500kms. The Agni III currently has the longest reach of any missile in South Asia; however, it falls well short of long range missiles that China currently possesses.

India is currently testing new missiles and discussing the implementation of a missile shield in 2010. The first missile that is currently being developed is the Indian Inter-Continental Ballistic Missile, the Agni IV. There has been no confirmation that this program exists, however there are several indicators that this has program has been underway since 1994. "The Agni IV is intended to be a single-stage, liquid-fuelled missile with an estimated range of 12,000km." (David J Creasman:2008). The second missile, the PJ-10 BrahMos is an ant-ship/land target cruise missile that has been jointly developed with the Russian Federation. With this missile, "India expects to significantly enhance its long-range strike abilities.
In addition to offensive capabilities, India is currently working on a defensive strategy that will ensure that their protection from missile launches in either Pakistan or China. This plan incorporates a complete ballistic missile defense system to be in place within three years."( Steve Herman:2010) In addition, "India is continuing to explore the possibilities of purchasing the technology and systems that have been offered by various countries such as the United States, Russia and Israel."( Steve Herman:2010).

Moreover, India is on mark to expand their nuclear arsenals even as nuclear weapons are on a worldwide decline, Stockholm International Peace Research Institute [SIPRI] reports. "India is increasing the size and sophistication of their nuclear arsenals and is developing and deploying new types of nuclear-capable ballistic and cruise missile and both are increasing their military fissile material production capabilities,"( Sushil K. Singh:2013) the SIPRI report warns.India's nuclear doctrine is based on the principle of a minimum credible deterrent and no-first-use of nuclear weapons.

**Nuclear Weapon Stocks**

David Albright, Frans, Berhout, and William Walkers estimation by the end of 1995 India's plutonium stockpile was sufficient for about 65 nuclear weapons and would rise to 85-90 nuclear weapons by the year 2000. (J. Carson Mark:1990). their estimate of 330-kg in India's plutonium at the end of 1995 could be low by as much as 30 percent, India's actual plutonium stockpile then might have been sufficient for 80-90 nuclear weapons. Projecting from Albright's figures, India could have plutonium sufficient for about 70-105 nuclear weapons by 2005 and can have 90-125 nuclear weapons by 2010.
Nuclear weapons are mere showpieces if they are not deliverable. To deliver these nuclear weapons to the targets, India has reliable nuclear capable aircrafts for more than two decades. By 2003 Indian nuclear delivery system includes Russia supplied MiG-27, Mig-29 and Su-30 Mks, along with France supplied Mirage 2000 and England supplied Jaguar. India has nuclear capable missiles. The short range missiles are Prithvi-I (range 150 km) first tested in February 1996. (Dr.Indrajeet Singh &P.R.Singh:2009) It is reportedly "in advanced stage of development. (Dr.Indrajeet Singh &P.R.Singh:2009) .Although its first testing has failed in April 2000. It was successfully tested in September 2001. India has medium range Agni missiles series. Agni-I was tested during the period 1989 to 1994. There are different reports as to the range of this missile. According to these, it has a range of 3500 km" 42 to 2500 km with a 500kg warhead and 1600 km with a 1000-kg warhead.(Dr.Indrajeet Singh &P.R.Singh:2009)

Agni-II (range 2500-3000km) first tested in April 1999. Agni (range 700-750km) first tested in January 2002. Agni-III (range 3500+km) first tested in 2007. Besides these land based delivery programmes. India also has a submarine based nuclear weapon delivery programme, it is called Advanced Technology Vessel (ATV). The work on this project is going on for three decades and is yet to be completed.

**Conclusion**

Indian nuclear power program, visualized by Dr. Bhabha in early fifties has been developed and successfully deployed both with indigenous efforts and western support, thus, placing the country in elite club of countries possessing advanced nuclear technology. The nuclear power has come of age with comprehensive capabilities in all aspects of nuclear power and is poised for a large expansion program.

As the quote at the beginning of the paper illustrates, the nuclear deal is a central facet in India's new ambition policy. In essence the nexus of energy, economic growth and global power status are now at the heart of India's nuclear policy. The major aim of the deal will have been achieved: India will have been internationally recognized as a responsible nuclear weapons state, and with it receives the global acknowledgement it has always sought.

India's nuclear policy has evolved gradually rather than dramatically. This is unlikely to change. Thus, there are little domestic political or international reasons to expect rapid changes in India's nuclear policy. But just as it is cautious in advancing its nuclear weapons arsenal, On the other hand, India is also unlikely to stage more nuclear tests or hugely increase its nuclear arsenal. Over the next decade, India should be expected to gradually increase the size of its arsenal and make it more robust and reliable, with some 6000 kilometer plus range ballistic missiles and possibly one or two submarines capable of firing long-range ballistic missiles.

Finally, it is crucial to note that India has shown restraint in its nuclear policy to establish good relations with the major countries in the nuclear non-proliferation regime, such as the U.S., and it recently finally obtained an unrestricted access to peaceful uses of nuclear energy from them. Therefore, India primarily desires to be a major-power with high-level and peaceful nuclear technology.

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