

“Nuclear South Asia: A Guide to India, Pakistan, and the Bomb”

Video Transcripts

Chapter 2: Nuclear History

2.1: “Models of Nuclear Proliferation and Mythmaking”

Scott Sagan:	00:05	Why do states build nuclear weapons in the first place? There are three basic models that political scientists use to help explain such decisions. The security model, which argues that states acquire nuclear weapons if and only if they have a security threat that can't be met by other means. A domestic politics model that suggests that different domestic political actors have interests, often parochial interests, in acquiring nuclear weapons, and when they acquire the power and the authority to make decisions, they will seek nuclear weapons for the state even if there isn't a security threat commensurate with that need. Lastly, there are normative models that argue that nuclear weapons serve a prestige or status role in international politics, and a statesman might decide they want nuclear weapons because they want the prestige, the status of being a great power, and believe that nuclear weapons are the surest path to get that.
Sameer Lalwani:	01:04	Strategic elites often create myths about their past history, their security environments, and their competition. And that's to motivate, legitimize, and mobilize a state towards a particular strategic goal, sometimes the pursuit of nuclear weapons. This can also involve myths about the utility and the feasibility of nuclear arsenals. And while they're grounded in actual material conditions and historical experiences, these myths can sometimes take on a life of their own during the mobilization and acquisition process. It's therefore critical for analysts to acquire a proper understanding of the nuclear history, and that includes nuclear chronologies, as well as the mixed motives at play for all actors. This can help to separate out some of the actual facts from the myths and the heroization of particular figures in this history.

2.2: “Atoms for Peace and Civilian Nuclear Energy”

- Amy Sands: 00:08 The "Atoms for Peace" program, I think of as sort of a fool's errand. I think it was a very misguided approach to policy in the 1950s dealing with nuclear energy and nuclear development. We put such a high level of concern and interest on what nuclear energy could offer a country, that it became sort of the gold standard, that if you could say you were developing nuclear power, you were sort of beginning to enter the league of those countries that are developing, that are entering the modern times. And so it became a symbol and a prestige symbol. So it didn't really lend itself to disarmament, or sort of preventing the spread of nuclear capabilities; it actually promoted it. And in that process, I think both India and Pakistan saw an opportunity to develop sort of a core capability in the area of nuclear energy that they could then use and leverage to their own interests in the nuclear weapons area. And that's exactly what happened both with India and Pakistan.
- Jayita Sarkar: 01:14 First is 1954, and that is when the government of India created the Atomic Energy Establishment, which later became known as the BARC, or the Bhabha Atomic Research Center. The second reason for 1954 is India signed an agreement with Canada for the CANDU-type reactor, which later became known as the CIRUS reactor. And third is the U.S. Atomic Energy Act of '54, which allowed private companies to access sensitive information concerning nuclear technology. And that led to companies like Vitro International to sell blueprints of a plutonium processing plant to India in the late 1950s. From the very beginning, Indian leaders believed that nuclear energy would lead to large scale industrialization of the country, and thereby lead to economic development faster. And there are early writings by Prime Minister Nehru where he talks in favor of this. There are scientists like Bhabha who's published in journals like Science, where he talks about how developing countries could develop nuclear energy. His own rival in India, M.N. Saha, also believed the same. So there was a consensus within India in the early years after independence that atomic energy, or nuclear energy, will lead to large-scale development of India that it needs badly as a newly independent, developing country. However, it has to be remembered that it's not that the dual-use nature of nuclear energy was something that Indian leaders were unaware of, because in 1945, as we know, there was the bombing of Hiroshima and Nagasaki. And so while the main force, or the main justification, behind India's nuclear energy program, or new nuclear program, in the early years was development, the dual-use nature was something the leaders

were aware of from the very beginning. The development-related justification allowed the acceptability of the atomic energy program across the board, across the domestic political spectrum.

Feroz Khan:

03:31

The greatest benefit that "Atoms for Peace" for Pakistan had was that Pakistani young scientists - it was a new nation, a young nation that was fascinated by the "Atoms for Peace" programs because of the nuclear science, as a matter of fact. "Atoms for Peace" program actually really provided them the window to go and learn all the science. And the most important benefit that Pakistan took from there was to send abroad in most top universities of the world, together, top scientists who would come back and eventually help the program in the 1970s. So the basics of Pakistan's soft technology, as I would call them, was a result of "Atoms for Peace" technology. The other component was the hardware, because Pakistan would get the peaceful transfer of technology into the country, like the power reactors; Karachi's nuclear processing plant is a case in point, so that the scientists could actually, you know, do the practical work on that. Were it not for "Atoms for Peace" knowledge that the Pakistani scientists, technicians, physicists, chemists had in the late '50s and the '60s, when they actually decided to really go for a full-fledged weapons program in 1974 onwards - these were the people that really came in handy at the time.

2.3: “The Road to Weaponization”

Zia Mian:	00:09	<p>The idea in Pakistan of acquiring nuclear weapons actually has a very long history. It actually begins in the early 1950s, when Pakistan signed a military alliance agreement with the United States and a large political set of agreements with the United States, as part of which Pakistan became a U.S. ally in the Cold War against the Soviet Union. The United States sent huge amounts of economic aid to Pakistan as part of this relationship. It sent economic advisers to Pakistan to help Pakistan develop its economy, and it sent military advisers to Pakistan to help reorganize Pakistan's military forces and bring them into the modern age. As part of this assistance to the Pakistani military, and to development, the United States brought modern American ideas of nuclear technology as being the future, and the role of nuclear technology in science, technology, and producing electricity for power, but also of nuclear weapons as the future of warfare. U.S. military advisers came to Pakistan's military colleges and gave lectures on nuclear war-fighting and helped Pakistani soldiers begin to understand that the next set of wars would be wars that involved the use of nuclear weapons., and that this is how nuclear war was to be conducted, and the role of nuclear weapons in military and foreign policy. So the first ideas about both nuclear war and nuclear technology were American imports into Pakistan as part of the U.S. "Atoms for Peace" program, and the U.S. Cold War effort to recruit allies and prepare to fight the Soviet Union in the next great war.</p>
Raj Chengappa:	01:57	<p>The main trigger has been that India has been looking for, particularly with China after the the 1962 war, realizing that conventional superiority will not exist between the two countries. And after China exploded its nuclear weapon in 1964, India felt compelled to move towards developing what was essentially a peaceful nuclear program till then, into one that would be of weaponization.</p>
Jayita Sarkar:	02:27	<p>What I call the "proliferation drift" is really a slow but certain movement towards nuclear weapons development, and there were internal and external factors involved. The external factors were, certainly, the Chinese nuclear test of October 1964, and then the Sino-Pakistan axis that was developing, which was becoming more and more clear with, first, the 1965 war where China sided with Pakistan. U.S.-Indian relations were extremely strained at that time, which convinced New Delhi that it could not perhaps count on Washington at times of a crisis. However, an argument can be made that if security is really the reason</p>

behind the proliferation drift, then why was it slow? Because drift itself, as I said, is slow but certain. What I found in the documents is that yes, there was security at stake for New Delhi, but it was not survival that was at stake. India did not feel that it could be annihilated by Pakistan or China. It was security interest at stake, as opposed to survival.

Feroz Khan: 03:36

The mid-'60s is a turning point in Pakistan's nuclear history, and this is the time when India, in reaction to China's test in 1964, began to turn its program towards a nuclear side - a nuclear weapon side - and the Pakistanis were watching at that stage. That was a very defining moment in Pakistan, when two lobbies grew, as I write in my book. One was a "nuclear enthusiastic" lobby, which was led by Zulfiqar Ali Bhutto, then the foreign minister. And the other one was the "nuclear cautionist" lobby, which was led by the president, Ayub Khan, himself. They began to have difference of opinion about which way the nuclear program should be turned, and that debate - that was a classic moment of Pakistan's history, where the Pakistani military leadership, the Pakistani financial bureaucracy, and the Pakistani atomic energy, scientists included - all three of them - began to contemplate as to what could be the problem areas if Pakistan changed the course from purely peaceful use of nuclear energy as a beneficiary of the "Atoms for Peace" cooperation that was going on at the time. The military was opposed because they felt that their conventional weapons would be jeopardized, and especially so as a result of the 1965 war, where they were then facing a U.S. embargo because of that war. The second thing was that the financial bureaucracy was always opposed to the nuclear program because they thought that whatever benefits they were getting from the Bretton Woods systems, that is the World Bank and the IMF - the economy was doing very well at the time in Pakistan, and they did not want that to be jeopardized. Similarly, the Pakistani scientific community at the time felt that their emphasis was to acquire more technology for peaceful purposes. Pakistan was a developing country, and a large number of their scientists and technicians and others were actually getting knowledge on the nuclear field all over the world, what I call "soft technological knowledge" under PAEC chairman Usmani and Dr. Abdus Salam. These were the people who really wanted Pakistan to grow into this new nuclear science more than do any hanky-panky in the manner where it jeopardizes the quest for their knowledge and any hardware that was coming for peaceful purposes.

Raj Chengappa: 06:11

It was in 1969 that Mrs. G, Mrs. Gandhi, then went ahead and said that we must go ahead with what was then an explosion. And so research speeded up. Meanwhile, the necessary

plutonium for doing the first test was getting cooked. India had not mastered all the technology. By about '71, '72, there was confidence that we could go ahead with it. Simultaneously, we had fought a war with Pakistan, defeated them in that war. Bangladesh was created.

- Feroz Khan: 06:54 50% of the Pakistani scientists, technicians, who now belong to Bangladesh instead of Pakistan, it [formerly] being East Pakistan. So many of the Bengali scientists and technicians who were working on Pakistani - even now [what is] new Pakistan's - power plants, etc., they had to migrate to Dhaka, back to East Pakistan. So there was a sudden shortfall of the technicians and scientific knowledge that went to the other country.
- Rabia Akhtar: 07:15 1972 Multan meeting was a meeting called by Prime Ministers Zulfiqar Ali Bhutto, where he gathered the strategic and scientific community of Pakistan and point-blank asked the scientists to give them a bomb. And the reason the Prime Minister Bhutto called that meeting was the Pakistan dismemberment that had taken place 1971, and the loss Pakistan suffered. It was too hard to bear. And had it been any other leadership other than Zulfiqar Ali Bhutto, probably 1972 Multan meeting would not have happened. But since he had this dream of giving Pakistan a bomb, and being the leader of a country which possessed nuclear weapons, an Islamic country, at that time the only [Islamic] country, it was his dream.

2.4: “India’s 1974 ‘Peaceful Nuclear Explosion’”

- Jayita Sarkar: 00:10 In 1974, on 18 May, India conducted the explosion of a nuclear device that it called a "peaceful nuclear explosion." It was a plutonium implosion device, and it had a yield of 12 kilotons.
- Vipin Narang: 00:23 So it wasn't necessarily a test of a nuclear weapon. But that said, it demonstrated that India's scientists had been able to master controlled nuclear fission suitable for explosives, and so it laid the groundwork for India's eventual weaponization. Even though the PNE itself wasn't a weapon, from a deterrent standpoint, if you were Pakistan or China, you would have to assume however, after the 1974 test, that India's scientists would be able to develop nuclear weapons relatively quickly thereafter from a decision to do so. And so India probably benefited from a deterrent standpoint after the 1974 PNE, even though it wasn't itself a nuclear weapons test.
- Scott Sagan: 00:59 I believe that the Indian decision to test a peaceful nuclear explosive in 1974 stemmed from domestic and bureaucratic interests. Indira Gandhi, wanting to show that she was tough during the emergency that she was going through, found the appeals of her scientists, who wanted to get nuclear weapons and have a test because they wanted to enhance their bureaucratic interests and give an excuse for why they were moving forward with nuclear programs. Mrs. Gandhi was therefore convinced, or persuaded, that having a nuclear test would help her domestically. And the scientists convinced her that the West wouldn't react very strongly, which turned out not to be true, which is why she didn't authorize later tests.
- George Perkovich: 01:48 I think there are a number of factors, but first have to say that one of the interesting things is it wasn't written down; in other words, there was no memorandum of decision that was recorded. There was not a formal debate. It was a very informal decision by Prime Minister Indira Gandhi and her advisers. The nearest we could tell was there was a technological push, so there'd been this program, and the scientists and technicians said they were ready. And they wanted to do it, and they had been pushing for a while. And I think she became amenable to it partly as a result actually of the '71 war that created Bangladesh, and it was the Soviet embrace. So the Soviet Union was India's ally, their partner, but as a result of that Brezhnev, the general secretary, was trying to get too close, and embrace India too tightly, and take India almost as a satellite. And so there was a sense that both your ally needed to be pushed away, and the U.S., which had intervened in the '71 war,

needed to also be pushed away. So there was a sense for India's autonomy, as well as to demonstrate its technological capability. It was time to demonstrate that they could have nuclear weapons as a way to say to everybody, "Back off. No one will ever tell us what to do. We're a major player."

Feroz Khan: 03:32

The really catalytic event that happened was India conducted the '74 test. Then they suddenly had a jolt: "Oh my God, what have we been doing until now?" So after that, there was such a deep and such a broad national consensus in Pakistan which - as I explained, in the mid '60s, there was still difference of opinion in other organizations. But after the '74 test of India, there was absolutely no difference of opinion in any organization. There was national consensus that Pakistan must respond to India's test.

Robert Einhorn: 04:13

The so-called "peaceful nuclear explosion" in 1974, India's so-called PNE: it's like a "peaceful nuclear explosion" is like a friendly punch in the nose. India's test in '74 was really a wake-up call to the international community that it was important to take non-proliferation more seriously. You had the Nuclear Non-Proliferation Treaty, which had only entered into force in 1970. So it was fairly new and undeveloped. It had to be supplemented by a variety of measures that were stimulated by the Indian test. For example, the Nuclear Suppliers Group was a direct result of the Indian test. India had violated its commitment to use nuclear materials imported only for peaceful purposes. It didn't fulfill that commitment. So the Nuclear Suppliers Group was going to adopt stronger multilateral export controls and assurances about conditions of supply, to make sure that suppliers would insist on tough conditions and the recipients of nuclear technology would not engage in the kind of activity India had engaged in. And, in general, at least in the United States, it led to legislation - the Non-Proliferation Act of 1978, which imposed much tougher conditions on U.S. supplies of nuclear materials abroad. In general, I think it sensitized the international community to take non-proliferation much more seriously.

2.5: “U.S. Sanctions and South Asia’s Nuclearization”

Dave Smith:	00:07	The nuclear part of the relationship with Pakistan has always taken second place to more immediate crises in the region. So, despite the fact that the United States imposed sanctions in 1978 and '79, it waived those sanctions in 1980 when the Reagan administration came into office in order to gain Pakistani cooperation in confronting the Soviet Union in Afghanistan. When the Soviets left, once again, the United States raised the ante.
Robin Raphel:	00:45	Throughout the 1980s, the president of the United States each year would certify that Pakistan did not have a nuclear weapon. This was required under the Pressler Amendment.
Rabia Akhtar:	01:03	The Pressler Amendment was passed in August 1985. It was a Pakistan-specific amendment, and the amendment held that U.S. aid to Pakistan - both military and economic - would be cut off if Pakistan was found in violation of the U.S. Nonproliferation Act of developing uranium enrichment technology. And by '85, there was considerable evidence during the Reagan administration that was found that Pakistan was proceeding along with its uranium enrichment program.
Michael Krepon:	01:29	The United States was working with Pakistan to expel the Soviet Union from Afghanistan. But the United States needed assurances from Pakistan that it would not be embarrassed by Pakistan's nuclear program. And Pakistan gave those assurances. Zia ul-Haq personally gave those assurances to President Reagan. And one of those assurances related to enrichment, that Pakistan would not enrich uranium beyond around 3%, which was consistent with a nuclear power program, but well below levels of enrichment needed for bombs. 1990 was a difficult year for India-Pakistan relations. There was a large-scale military exercise held by Pakistan; India reacted to it. There was a lot of tension in the region and concerns about, perhaps even warfare. And during this crisis, around the time of this crisis, the U.S. government got information that General Zia's pledge not to enrich beyond 3% was being broken and that Pakistan was indeed proceeding with cores for nuclear weapons. And with this information, the United States invoked the Pressler Amendment.
Robin Raphel:	03:15	The Pakistani view, I think, of the invocation of Pressler sanctions was that this was really the great betrayal after all the help they'd given us in Afghanistan, and from their point of view, they'd been a good friend to the United States. So it was

this sanctioning under the Pressler Amendment that underlies a lot of what is now called the "trust deficit" between the United States and Pakistan. And the Pakistanis also felt we discriminated against them. They knew India had a program, but India wasn't being sanctioned. And in fact India had tested in 1974, their so-called "peaceful nuclear explosion" (PNE), and they hadn't been sanctioned.

2.6: “The NPT, the CTBT, and India’s Near-Test”

George Perkovich: 00:05

The scientific establishment, again, had been very frustrated. They had wanted to test since after the 1974 test, and they had come close several times and had been authorized to dig holes in the ground in the early '80s. They still wanted to push. Number one. Number two: they were aging. So the people who designed the device and tested it in '74 were aging and getting closer to retirement, so they worried that you needed a new cadre, new leadership, in the establishment who would be able to be both motivated, but also have some confidence in what they were doing without a test. It was going to be very difficult to, kind of, transfer knowledge and bring in and recruit new talent into the system. There was also the feeling that if the Nuclear Non-Proliferation Treaty was going to be extended indefinitely, which ended up happening in mid-1995, India was then going to come under enormous pressure with a comprehensive test ban, and that this was a priority of President Clinton and others. And so Indians looked out, the Indian leadership looked out, and said, "well we may come under such severe pressure with the test ban, that we might not be able to test unless we do it before they agree on the test ban." Now as we know, the test ban was completed in '96. It still hasn't entered into force. So there was this big move to test in '95, and then when it was discovered by the U.S., the U.S. put pressure on the government of Narasimha Rao at the end of '95. Once again, there was this sense that it just wasn't that important politically, it wasn't so important for the political leadership to run the risk of sanctions and international isolation. So they avoided it, and there was a new government coming, there were elections coming in '96, so it was put off in '95.

Jayita Sarkar: 02:13

As the CTBT was being negotiated in Geneva, India played a very active role, like it did once again, with the ENDC negotiations for the NPT. However, it refused to sign eventually, primarily because of two reasons. That is, according to India, it was not going to lead to universal nuclear disarmament. And second, it considered the treaty to be discriminatory because countries like India still needed to conduct nuclear tests. Because such tests were conducted so many times by the superpowers to perfect their nuclear devices, that India hadn't done then. And so it considered the treaty discriminatory, and it considered the treaty was not a step towards comprehensive universal nuclear disarmament.

Michael Krepon: 03:04 India was a strong supporter of a comprehensive test ban. Prime Minister Nehru believed deeply in it, was one of the primary opponents of nuclear testing. But by the time that the negotiations actually took place to complete a comprehensive test ban treaty, India was between a rock and a hard place. It tried to be true to its disarmament and test ban treaty heritage, but it had obvious problems in the neighborhood. Pakistan presumably had bombs in the basement. China had a nuclear arsenal it had already tested. So what to do? India remained a part of the treaty negotiations really until the eleventh hour, and backed away when the entry-into-force provision of this treaty was crafted. Entry-into-force means the treaty remains in limbo until countries signed and ratified. How many countries? Well, the solution that the negotiators drafted was that over 40 countries had to sign and ratify, countries that had nuclear capabilities. And India viewed this as a very impolite way of roping them into a treaty and constraining their sovereign rights. So India walked away.

Feroz Khan: 04:57 Into the mid-1990s when the CTBT debate began, that was the other part where Pakistan decides as to how they would respond in the event India conducts a test. And this is the period after it was discovered that India might conduct tests, just as the run up to the CTBT negotiations. It was at that time the Pakistani policy was that if India conducts a test, they will conduct a test.

2.7: “India and Pakistan’s 1998 Nuclear Tests”

Vipin Narang:	00:05	On May 11th and 13th, 1998, India's BJP government, which had been in office for several months after establishing a stable coalition in New Delhi, decided to take India over the nuclear weapons overt threshold by conducting a series of plutonium nuclear tests in the Rajasthan desert. A total of five nuclear weapons were tested. Most were believed to be miniaturized or actual weapons designs.
Jayita Sarkar:	00:31	India had been working on its nuclear arsenal for a few years, more than a few years, and the scientists needed to test those devices. So there was a scientific need to conduct the nuclear tests, and India had opposed the CTBT, the Comprehensive Test-Ban Treaty, in 1996. And with the tests of 1998, it conducted these tests in opposition to the CTBT. But again, legally it did not violate the treaty because it never signed it.
Lisa Curtis:	01:04	How can we convince Pakistan not to follow suit? So there was a lot of thought given in that two-week interim period between the Indian and Pakistani tests about, you know, was there anything we could provide to Pakistan or offer to Pakistan that would coax them to not follow suit and test nuclear weapons? And of course, we found that that really there was no way to convince Pakistan that it wasn't in its own fundamental security interest to answer the Indian test with its own test.
Mansoor Ahmed:	01:52	Pakistan is known to have conducted five nuclear explosions in the underground nuclear test site in the Ras Koh Hills in western Balochistan. These five tests were conducted on May 28, 1998 at about 3 pm in the afternoon, in response to India's test of 11th of May and 13th of May, 1998. Another test was conducted, the sixth test, on the 30th of May at a different nuclear test site known as Kharan.
Feroz Khan:	02:19	After the '98 test, when India did test on 11th May and 13th May, those were the 17 days of decision, whether or not to respond to India, to test or not. I think the majority of the Pakistani state's organs, including the military, the Foreign Office, and many other people had almost decided that they would have no choice but to respond at this stage. And the principal reason at the time was that even though they were facing tremendous amount of economic problems at the time and economic sanctions were looming if they did the test, the majority of that decision was that if Pakistan now does not respond to India's test, its deterrence capability would be compromised.

Touqir Hussain:	03:03	<p>Pakistan was in a kind of quandary. There was no consensus on what to do, whatever little I know, the Foreign Office was quite active and key because it had taken on a long-held belief that India had strong nuclear ambitions, and Pakistan may have one day to, sort of, respond to that. If it did not, Pakistan would be considered as having bluffed about its nuclear program. The military was kind of neutral; it would have probably felt comfortable either way, whatever the decision was, whether to test or not. The prime minister was somewhere in the middle. And then the time passed, almost I think two weeks had gone, and Pakistan had not tested. And the Pakistani public was getting very restive.</p>
Robert Einhorn:	04:10	<p>The immediate concern was, at that time, to try to avert a dangerous nuclear arms competition between India and Pakistan, a competition which could stimulate similar nuclear weapons and missile activities outside of South Asia. So when the U.S. began to engage both with India and with Pakistan, each bilaterally at that time, the objective was restraint: restraint in both the nuclear weapons programs and restraint in the long-range missile delivery programs. The agenda was not rollback. It was not denuclearization. The U.S. was realistic enough to know at that time that neither India nor Pakistan were going to eliminate their nuclear programs. The objective was restraint.</p>
Rakesh Sood:	05:14	<p>The 1998 test by India was another down, in the sense that the U.S. and other countries imposed sanctions on us. But then, we began a very intense dialogue between the then Deputy Secretary of State, Mr. Strobe Talbott, and the Indian Foreign Minister, Mr. Jaswant Singh. We went through fourteen rounds of talks between less than two years, and that sort of broke the ice and created a sense of trust, and most of the sanctions were lifted by the time President Clinton visited India in March of 2000.</p>
Rabia Akhtar:	05:45	<p>Nuclear sanctions: after India tested on May 11th 1998, Pakistan knew fairly well what it had coming its way. Pakistan was informed by the U.S. administration that the sanctions will follow, the Glenn-Symington sanctions that would go into effect immediately and automatically if Pakistan was to test. Pakistan would not be able to survive those sanctions, while India would be. So the sanctions were fair, because the law was passed in '76 and '77, so we had a couple of decades to, you know, get this understanding through our system that if any test would take place, Glenn-Symington would go into effect. As to how far those sanctions were effective, I really don't think they were that effective because the same year, in 1998, in July and</p>

October 1998, there were some relief packages that were offered by the Clinton administration to both India and Pakistan to influence their decisions into getting into an arms race. There was an agriculture appropriations bill that was passed in July 1998 and in October 1998. There was an India-Pakistan relief package that was signed, and both these packages eased the sanctions that were imposed. They gave the administration waiver to waive off Glenn and Symington sanctions, and even Pressler to some extent, where Pakistan was concerned. So the effectiveness probably, you know, in the non-proliferation context, was not as effective. But yes, the sanctions are fair.

Sameer Lalwani:

07:29

India and Pakistan's nuclear tests in 1998 triggered a wave of U.S. non-proliferation sanctions, including the suspension of military aid, diplomatic support, and foreign assistance, including from the IMF and the World Bank. But at the same time, U.S. lawmakers were quite divided on the issue and within a few months, either lifted or weaken the sanctions on India and Pakistan. Other countries joined in on the sanctions regime, including Canada, Germany, and Japan, and cut bilateral aid to the countries. But this did not necessarily have a major impact. There really wasn't a broad base of international support for the sanctions, and so they did have some effect on the flow of private capital, but not a tremendous one. Overall for India, the impact was maybe a marginal economic impact, not necessarily a tremendous one. The estimated costs for the sanctions were anticipated to be roughly 21 billion dollars, and in actuality turned out to be roughly 500 million. For Pakistan, the consequences were a little more dire. They had been previously more dependent on the IMF for loans, and so this hit them harder. But within a year, the sanctions started easing and after 9/11 the sanctions regime was all but done away with.

2.8: “Foreign Cooperation and Proliferation in South Asia”

Jayita Sarkar:

00:05

No national nuclear program is completely indigenous. For instance, the Manhattan Project, which was a wartime effort, was possible because of three countries, and several scientists fleeing Europe. Likewise, in the Indian case, India received foreign assistance from countries like Canada, the United States, and France. And later on, other countries also helped, like Russia. Foreign assistance is absolutely pivotal in India's nuclear program, primarily because it has been a developing country from the very beginning. It did not have access to technology that it needed to start a civilian nuclear program. However, what makes India stand out as a developing country is that it always asked for technology transfers as opposed to finished products. In a sense, India always wanted to have some component of learning involved in the cooperation that was happening. However not all countries were willing to offer that transfer of technology; the United States stands out as an example because the 1963 agreement with the United States for the two boiling water-type reactors were turnkey projects, that is, they were supplied by General Electric and Bechtel. And it was there for the Indians to operate. There was no learning involved in that cooperation. The Canadian assistance - the agreement which was signed in 1954 and then finally led to what we call the CIRUS reactor - was a CANDU-type reactor, and it produced plutonium as a by-product. And as is well-known, India used plutonium from that reactor, reprocessed that in its Trombay reprocessing plant, and used it in the nuclear device that it tested in 1974. India's cooperation with the French stands out because it was in 1951, two years before the "Atoms for Peace" speech of President Eisenhower, that India signed an agreement with the French on beryllium moderated research reactors, and that demonstrates the proximity between the French and the Indian atomic energy commissions.

Jayita Sarkar:

02:22

The three-stage program that we consider to be extremely relevant for India's nuclear program, and it's a three-stage program that will eventually make sure that India's program is self-sufficient, has a very significant French influence because the French also had a three-stage program in the early 1950s. However, as more uranium was discovered, the French gave up that three-stage program because it did not believe that plutonium fuel reactors were required. Third, the French influence, or the French assistance to India, stands out for breeder technology where one of the first agreements was signed in the late '60s. And such cooperation has gone on. There has been extensive training of Indian personnel in France

in breeder technology. So France is also a very significant technological partner for India, not to mention also, not to forget also, that the French were more open to technology transfers than other countries, other suppliers.

Feroz Khan:

03:27

Almost every country's program, nuclear program, has benefited from one country or the other. In Pakistan's case China-Pakistan cooperation is very widely known and widely written on, so it's an established fact. But in addition to that, the story of Pakistan's nuclear weapons program is more about defiance from Western technology that was promised and not delivered, specifically with France, Germany, and other countries. Because the United States gave tremendous pressure on Pakistan in the 1970s to deny them the technology, which actually forced them to start thinking and innovating technological assistance in ways that might not have happened otherwise, if the technological transfer were as easy or as promiscuous as it was in the '50s and the '60s. So in some sense, the Pakistan technological denial incentivized them to start inventing themselves. But then in other words, they started then - that contributed itself to finding technology by other means, which resulted in the A.Q. Khan network.

2.9: “U.S. Nonproliferation Legislation”

- Rabia Akhtar: 00:09 India-Pakistan War took place in 1965. Both countries were supplied by U.S. arms, and both violated their commitment to the U.S. not to use that armament against each other. And when the war took place and both used and violated those terms of the sale, the United States imposed sanctions on both India and Pakistan. It was at that point in time when differences between President Ayub and his foreign minister, Zulfikar Ali Bhutto, emerged, and it was at that time that Zulfikar Ali Bhutto started thinking about how to get back to, you know, having a face-saving situation with India. And to my mind, if we go back in history, that to me is an important time period in which Pakistan - because of the leadership that followed years, later led by Prime Minister Zulfikar Ali Bhutto - was an important time period when the earlier nuclear thinking emerged.
- Rabia Akhtar: 01:15 Symington Amendment was the first U.S. non-proliferation amendment that was passed by the U.S. Congress in 1976, two years after the Indian nuclear test. The amendment held that sanctions will be placed on a country and U.S. foreign aid to that country, both economic and military, would be cut off if the country was found involved in purchasing, buying, you know, uranium enrichment technology. The Glenn Amendment was passed a year later, and it was an update of the Symington Amendment. And together both these amendments are called the Glenn-Symington amendments, and the Glenn Amendment added to the Symington Amendment that U.S. aid would be cut off to those countries who would possess purchase, or be involved in import-export of, uranium enrichment technology, the plutonium reprocessing technology, along with aid would be cut off to those countries who would be considering to conduct nuclear tests.
- Rabia Akhtar: 02:21 Pressler Amendment was passed in August 1985. It was a Pakistan-specific amendment, and the amendment held that U.S. aid to Pakistan, both military and economic, would be cut off if Pakistan was found in violation of the U.S. Nonproliferation Act of developing uranium enrichment technology. And by '85, there was considerable evidence during the Reagan administration that was found that Pakistan was proceeding along with its uranium enrichment program. The Solarz Amendment was also passed in 1985 by the US Congress, and it came in the wake of two Pakistani-origin officials - not officials, Individuals - who were caught smuggling nuclear technology components out of the United States. And the amendment held that U.S. aid would be cut off if Pakistani-

origin individuals were caught. But the amendment that - in 1987, the amendment was invoked in case of Pakistan, when individuals were caught. But President Reagan invoked and waved off the sanctions at the same time.

2.10: “India’s Nuclear Ambivalence”

Rajesh Rajagopalan: 00:05

You see that ambivalence continuing even in the 1960s after Nehru, because after the 1964 Chinese nuclear test, there was a big debate in India, obviously, about India building nuclear weapons. Dr. Homi Baba, who was a leading Indian nuclear scientist and the head of India's nuclear program, was very active, very public, about India building nuclear weapons. But India's prime minister at that point of time, Prime Minister Lal Bahadur Shastri, was not very keen on nuclear weapons. He was a Gandhian, and he had the same sort of opposition to nuclear weapons that many of India's political leaders had. But he was also finding it difficult to counter Baba's claims that India's nuclear weapons program, a nuclear weapons program for India, would not be very expensive. So in fact, Prime Minister Shastri goes to the extent of asking the government of Britain for data on the costing of nuclear weapons, which the British, of course, would gladly provide him showing that a nuclear weapons program would be quite expensive, even though British documents themselves showed that the British government did not believe that it would be really expensive for India to build nuclear weapons. But nevertheless, they gave him that kind of data, in order so that he can counter Baba's arguments about the expense of nuclear weapons. But you see this continuing also in the 1965 though '68 negotiations over the Nuclear Non-Proliferation Treaty. India was actively participant in the treaty until almost the very end. Finally, even though India was keen on the treaty, because India accepted the logic of the treaty, which was that the spread of nuclear weapons was a danger to the world and to international security. But nevertheless at the very end, as the negotiations were winding down at the very last minute, India pulled out of that treaty negotiations and pulled out of the treaty, did not sign the treaty, primarily because India was concerned about how to deal with the Chinese nuclear threat because China had built, or had already tested, had tested several times by that point. And India had pursued nuclear security guarantees from both the United States and Soviet Union, and they were given, I mean, some sort of nuclear security guarantees were given, but these were not guarantees that India had much confidence in. And so the prime minister at that point of time. Mrs. Indira Gandhi, did not want to foreclose India's option given the Chinese nuclear threat. So even though she did not authorize a nuclear weapons program at that point of time, she nevertheless decided not to sign the treaty because that would have foreclosed India's nuclear weapons option. Now 1974, India did test under Mrs. Gandhi. She did order a nuclear test,

nuclear explosive test. But that ambivalence comes through because India once again shut down its nuclear weapons program after 1974 for the next ten years, primarily because, I think partly because, of international pressures, but also because once again India was not very clear about what role nuclear weapons would play in India's strategy.

George Perkovich: 03:22

The assumption is always that once you start, you do a series in order to militarize a capability, and this indeed was Henry Kissinger, at the time Secretary of State, his assumption. And what he said to the U.S. bureaucracy, is, you know, "Let's stop telling them not to do more. Of course they're going to do more tests, they're going to weaponize." And I think the reasons are multiple. One, India is a democracy. And Indira Gandhi, the prime minister, was in a lot of trouble shortly after the test, declared emergency in '75. And in Indian domestic politics in the year succeeding that test, there was a whole lot else that was much more important, and the thought was that conducting a nuclear test would be a distraction, it could impose international costs, and it wouldn't solve any political or economic problem that the government faced, so it was kind of irrelevant. So the scientists kept pushing, and she just kind of said, "not today" and would focus on other things. There also was, and this is related, a moral ambivalence. So the '74 test, they insisted, was a "peaceful nuclear explosive." Well, if you do another one, it's pretty obvious that it's a weapon, and it's hard to say it's peaceful. But India always wanted to be morally superior to the U.S. and the Soviet Union and the other nuclear weapon states.

Vipin Narang: 04:44

Congress prime ministers ruled India essentially, except for a brief interregnum in the late 1970s, up through basically 1996 in India's history. So we're talking about 50 years of Congress rule, and it was the BJP in 1996 who thought about testing nuclear weapons. And Prime Minister Vajpayee in the thirteen day government decided to abort the tests because he didn't want to leave his successor with the ramifications and consequences of the test. But then when they came back into office in 1998, finally pulled the trigger on India's nuclear tests. And although, you know, there's a lot made of the differences between Congress prime ministers & Nehru and the BJP, the reality is that India and the BJP wouldn't have had anything to test if not for Congress prime ministers over the years taking India to the point where it actually developed nuclear weapons in India's arsenal. So I think if there is a difference, it's that the BJP is probably more comfortable with being an open nuclear power, and Congress was more ambivalent about declaring India as a nuclear weapon state.

Rajesh Rajagopalan: 05:58 Even today, India has nuclear weapons, but continues to be at the forefront of nuclear disarmament efforts, calling for a nuclear weapons convention, for example. So that ambivalence about nuclear weapons persists. Now, why that ambivalence? I think the primary reason for that ambivalence is the fact that India has a very large state, it's fairly secure, its neighbors are fairly small, do not represent a major threat, and do not, definitely, represent an existential threat.

George Perkovich: 06:26 After '98, they did the test, but again, they haven't tested since. But more importantly the political leadership: Prime Minister Vajpayee, he didn't get excited about nuclear weapons. The apex of the political system didn't say, "Okay, now we really want to focus on what kind of arsenal we need and building up this capability, and whether it's racing to deal with China or otherwise." Things kind of crept along ambivalently. Then Manmohan Singh followed Vajpayee, and also, you know, clearly this feeling of, "Look these are political weapons. They're not useful, they're not militarily front-and-center. They're not things we really want to talk about." So it's remarkable, India in this way, and the closest to it, in some ways, was China, up until the last couple of years, with a kind of general sense of restraint. You don't have to go crazy, you don't have to build a thousand of these things, you can have a no first use policy. The sense that they're an existential deterrent, that nobody can invade your country or commit sustained military aggression with you, without worrying that you could hit them back in a devastating way. And that's kind of all you need to do. And they don't get so excited about counter-force and first use and escalation and how to use nuclear weapons. And so it's been remarkable. But like I say, I mean, you've seen that in China as well. It's very different from the U.S. and Soviet Union.

Michael Krepon: 08:06 Pakistan is out-competing India when it comes to nuclear weapons. India has very high-profile projects, but on the nitty-gritty, the number of new warheads that are built every year and stockpile size, Pakistan is now ahead. How can that be? The answer is because India remains very ambivalent about nuclear weapons, whereas Pakistan's leaders are extremely clear. They're very purposeful. Pakistan sees the absolute need to have these weapons to compete against a stronger neighbor with a much stronger conventional capability. So, Pakistan has a first use policy. India has a no first use policy. Pakistan takes military requirements seriously because that's what military men do. India's political leaders view the bomb more in political terms, as well as prestige terms, rather than in terms of military requirements. Moreover, for Pakistan, it's not just planning to use nuclear weapons if absolutely necessary. You use a weapon

so as not to come in second. So, we have a big paradox here, and it makes stability hard. It makes deterrence stability hard because we have a smaller state very serious about nuclear weapons, and in some respects out-competing the larger state, which is ambivalent about these weapons.

2.11: “Personal Reflections on the 1998 Nuclear Tests”

- Abhijit Iyer-Mitra: 00:05 The 1998 test: my first memory would be euphoria, the fact that we had finally arrived. And then I remember by three, four hours later, it was a sinking feeling because there was this fear of sanctions, which wasn't being spoken about at that point of time, and it was almost certainly coming. There was a fear of some kind of a Pakistani military incursion. There was some kind of a fear, and these were all esoteric fears at that point of time, of Pakistan going nuclear as well.
- Salma Malik: 00:46 The first time when India went nuclear, it was kind of a shock. And not exactly a disbelief, but the factor that "Okay, they have done it again," and now immediately as to what is going to be Pakistan's reaction. And the minute we logged onto the news and the CNN and BBC were going loud and clear about the Indian nuclear test, the immediate reaction was how Pakistan would respond and what kind of sanctions could be placed. So it all became very political. And then of course there was a lot of jingoism on both sides. But it was immediately after the test, the factor as to "What is going to happen next?"
- Jayita Sarkar: 01:25 I was 12 years old at the time, and I was in school. I was in India, and what I remember is, after the test, there was this huge nationalist upsurge in my country. And the media reports that that were published every day tried to paint a picture as if India was pitted against the West and the world. And it was a bit of a zero-sum, us-versus-them game that was going on. Another significant personal memory I have is that I'm from Calcutta - I grew up there, and so we have a festival in the fall called Durga Puja, which is our Christmas - and I remember that fall in 1998, there were nuclear-themed decorations in some parts of our neighborhood.
- Zahid Imroz: 02:19 We were very young - I was just 12 years old, but the very first thing which I started observing: that the models of the missiles and the bombs just started mushrooming in the different squares of the cities. And one interesting thing was all of a sudden, a new wave of nationalism associated with the nuclear program and nuclear bombs emerged, and we started talking about that. The toys were replaced with the models of the bombs and the dummies of the atomic weapons. And I still remember that the badges on Independence Day we bought to put on our collars and on the shoulders, were the models of the Ghauri missile, and of national flag, and nuclear weapon is hanging with that. So that thing injected a new sense of national pride, which was coming from these nuclear weapons. Though

we were very young, we didn't know what we were basically practicing, but it was inculcating a new sense of nationalism through the weapons and the bombs, and A.Q. Khan was one imposed national hero.