



PROGRAM ON STRATEGIC STABILITY EVALUATION (POSSE)

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Diffusion of Nuclear Knowledge: Technology, Policy and Posture

(A Case-Study of Pakistan)

POSSE Policy Memo

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This memo is based on an on-going study that explores the phenomenon of nuclear knowledge diffusion at conceptual level. Based on conceptual understanding it traces diffusion of nuclear knowledge in Pakistan with a focus on three main areas; technology, policy and posture. The underlying idea is to first investigate if diffusion of nuclear knowledge has propelled or accelerated nuclear proliferation and then evaluate the possibility of using ‘knowledge diffusion’ as a process to promote strategic stability, nonproliferation and disarmament.

It defines ‘Diffusion of Nuclear Knowledge’ as a process that deals with spreading of any idea – through transfer, imitation or adoption – that is directly or indirectly related to the making of nuclear weapons or doctrines of their use.

It argues that Nuclear Knowledge is a highly specialized form of knowledge having serious political and security implications. While the policy decisions relating nuclear weapons are taken at institutional or state level, diffusion of this knowledge at individual level also needs to be traced to understand the broader dynamics of policy decisions.

Tracing the history of Pakistan’s nuclear program, the study argues that Pakistan’s nuclear weapons program is a result of combination of imitation and innovation. From the decision of developing Pakistan’s atomic bomb to the technological processes involved in the evolution of the program and later the key policy issues as well as matters relating operational strategy appear to have been heavily affected by the diffusion of nuclear knowledge.

Diffusion of knowledge relating nuclear technology occurred largely as a consequence of Atoms for Peace program as well as the exposure of Pakistani scientists to highly advanced centers of scientific education in Europe and the United States. This diffusion of knowledge however occurred only at the level of agents who were either directly in touch with the source or were

indirectly part of the process. Therefore it took a sufficiently large number of individuals to acquire this knowledge to create the pro-bomb lobby that later helped develop the Bomb.

Unlike technology, in case of issues like policy decisions, it is often hard to determine if diffusion of knowledge was a determining factor behind particular choices. However, some instances help figure out the implicit connection between diffusion of knowledge and policy choices. For instance, if we look at the case of Pakistan, back in 1960s, security was a serious challenge and the concern to resolve this predicament was predominantly shared. The question was how to deal with it? Ayub Khan, an Army chief with a background of conventional military knowledge sought solutions to Pakistan's security challenges in the form of upgrading and developing conventional military arsenal. However, Zulfikar Ali Bhutto, a graduate of Berkley was fully convinced of the necessity of a nuclear deterrent for Pakistan's survival. One could assume the impact of knowledge diffusion as a result of his time spent at Berkley and Oxford just at the dawn of the Cold War era, when the debate on nuclear deterrence was clearly developing fast.

However, Pakistan's early conception of deterrence was rather simplistic. The primary focus was to build the bomb. It was only after Pakistan's nuclear tests in 1998 that the discourse on deterrence began to receive attention.

The trends in Pakistan's nuclear policy and posture thereafter largely reflect imitation of the dominant deterrence discourse (of the Cold War era) with a few instances of divergence. For example, Pakistan's nuclear doctrine in the early years reflected semblance with the US policy of massive retaliation. Also the first use doctrine clearly followed the same line. However,

Pakistan's recessed posture, minimum credible deterrence and low readiness levels during early years reflected contrary trends.

This study argues that a host of factors explain these inconsistencies including, disconnect between policy and posture as well as the involvement of the US to prevent an arms race in the South Asian region.

The more recent shift in Pakistan's policy from 'minimum credible deterrence' to 'full-spectrum deterrence' however reflect an increasing influence of the Cold War discourse on Pakistan's military calculations. Theoretical discourse on 'diffusion of knowledge' addresses this dichotomy by arguing, "uncertainty of adoption is a function of time, which means at the end of the diffusion process uncertainty regarding the adoption should tend to zero, while at the beginning and in the middle of the diffusion process uncertainty of adoption is high."

This study also investigated why few things diffuse while others do not. For instance, why Pakistan appears to have remained unaffected in cases like Nuclear Posture and Nonproliferation? It argues that following factors explain this dilemma;

- Availability and access to knowledge
- Degree of Relevance based on need assessment
- Political Will and state's patronage
- Resources
- The time-factor

- Adversary's Policies

The study notes that any situation where the source and the agent agree on a common agenda, it would be easier to transfer knowledge in a directed manner with targeted information. However, any program that would look at the possibility of diffusing knowledge on issues where the agent and source stand in clear conflict, a targeted plan may not work very effectively. Rather a more random diffusion would help transmit the knowledge. In case of Pakistan's nuclear program for instance; learning through atoms for peace exemplifies the situation where the transfer of knowledge occurred as a consequence of mutual consent of the source and agent. In other cases of individuals however, it was a rather random process mostly shaped by the predominant discourse.