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Nuclear proliferation risk: Analysis of the selected countries

Diploma Thesis

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Brno 2015

Declaration

I declare that I elaborated this diploma thesis "Nuclear proliferation risk: Analysis of the selected countries" individually by using literature sources mentioned in the list of literature.

In Brno, ..., 2015 Lenka Látalová

….....

ABSTRAKT

Látalová L., Hrozba proliferace jaderných zbraní: Analýza vybraných zemí. Diplomová práce

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Pochopení motivací, které vedou státy k rozhodnutí vyvinout jadernou zbraň představuje základní úlohu při pokusu o zabránění jejich šíření. Tato diplomová práce je zaměřena především na analýzu těchto proliferačních motivů a to u vybraných zemích: Íránu, Sýrie a Libye se záměrem předpovědět zda by tyto státy v budoucnu mohly představovat reálnou hrozbu. Text je rozdělen do tří hlavních částí. Po obecném uvedení do tématu a popisu základních pojmů, diplomová práce analyzuje jadernou vybavenost vybraných zemí a s pomocí Saganových teoretických přístupů také možné motivace těchto států vyvinout jadernou zbraň. Navrhová část poté odpovídá na otázky: Jsou Saganovy modely užitečné při posuzování úmyslů vybraných zemí? Mají vybrané země v úmyslu vyvinout jaderné zbraně? Mohly by v budoucnu představovat hrozbu?

Klíčová slova:

Irán, Sýrie, Libye, Saganovy modely, jaderný vojenský program, proliferační motivy

ABSTRACT

Látalová L., Nuclear proliferation risk: Analysis of the selected countries. Diploma Thesis

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The understanding of motives which lead the states to the decision of nuclear procurement represents the fundamental task to stop or at least limit the nuclear proliferation. This diploma thesis primarily focuses on analysing the proliferative motives of the selected countries: Iran, Syria and Libya with intention to predict if the states could pose a threat in the future. Text is divided into three main parts. After general introduction of the the topic and description of essential terms, the diploma thesis analyses the nuclear capability of the selected countries and with the help of Sagan´s theoretical aproach also possible motives of

the states to build a nuclear weapon. Suggesting part then deals with the answer of the questions: Are Sagan´s models helpful in assessing the state´s intentions? Does the selected countries intend to develop nuclear weapons? Could they pose a threat in the future?

Keywords: Iran, Syria, Libya, Sagan´s models, nuclear military program, proliferative motives

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INTRODUCTION

"*Those who cannot remember the past are condemned to repeat it.*"[1]

(George Santayana)

The memory of what happened at Hiroshima and Nagasaki in 1945 could be considered as one of the main reasons, why states seek to stop proliferation of nuclear weapons. The demonstration of its enormous destructive power led to immediate attempts to limit its potential abusement and with believing the fact that the nuclear weapon proliferation would increase the future risk of nuclear war, 190 states signed the Treaty on the Non-Proliferation of Nuclear Weapons. The treaty entered into force in 1970 and under the responsibility of the International Atomic Energy agency, it establishes a nuclear safeguard system and order. Although, the NPT is identified as the most influential in nuclear international security, it underwent severe crisis as it not only failed to prevent e.g. North Korea from developing nuclear weapon, but also, as it became clear recently, other states managed to hide a cladestine uranium enrichment program despite the regular IAEA´s inspections.

The qoute stated above reffered to the fact that it is necessary to take the lecture from the history. By analysing the cases of proliferation it could be possible to avoid the same mistakes and prevent others. In this regards, the fundamental question to answer should be why these states pursued to develop nuclear weapon in the first place. Only understanding the state´s motives can provide the viable proposals to stop the proliferation of the nuclear weapons. Although traditionally, the motive of assurance national security is put forward as the main motive of nuclear proliferation, numerous case studies demonstrated that motivation to acquire nuclear weapons vary in each individual case. Scott Sagan in his work "Why Do States Build Nuclear Weapons?" indicates that among security, there are other two aspects which need to be analysed and refers to "the domestic politics model" and "the norms model".

[1] George Santayana, The Life of Reason: Reason in Common Sense. Scribner's, 1905: 284

This diploma thesis will apply all the three main models of motivation to the cases of Iran, Syria and Libya with intention to identify factors which can influence their possible decision to seek nuclear procurement and then predict if the states can pose a threat in the future.

1 LITERATURE RESEARCH

1.1 Proliferation

The issue of nuclear proliferation is currently one of the most discussed topics in international relations. The term "proliferation" is generally used to describe a process in which the state or non-state actors seek to acquire weapons of mass destruction, related technology or sophisticated carriers of these weapons.

By the term "nuclear proliferation" or "proliferation of nuclear weapons" is usually described transfer of nuclear weapons, fissile materials, militarily usable nuclear technology, information and knowledge, as well as domestic research and development leading to the profit of these weapon systems.[2]

1.1.1 History of nuclear proliferation

Development of nuclear physics can be dated to the 20th and 30th years of the 20th century. As a crucial point is considered the year 1939 when it was discovered that nuclear fission reaction releases a large amount of nuclear power. Being aware of a great potential of this reaction, government-supproted research in the new field of physics took place in many research institutions across the United Stated. A significant development is connected with the Manhattan Project. Its achievments were demonstrated in the year 1945 with the bombing of the Japanies cities Hiroshima and Nagasaki. The performance of extremely devastating power of nuclear weapons immediately provoked a fierce debate and a neccesity to seek a way to limit the proliferation of these destructive means.[3]

First attempts came already in November 1945 with establishment of the United Nations Commission for Atomic Energy (UNAEC). In the following years, a number of proposals and restrictions was released, however, none of them was accepted in international arena and UNAEC was subsequently dissolved.

In 1953, president Dwight Eisenhower proposed a creation of an international institution which would promote a peaceful application of nuclear power. The positive perception of his designs resulted in establishment of International Atomic Energy Agency (IAEA) in 1957. The organization encourages the development of the civil application of

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[2] Ondřej Rojčík, Režim nešíření jaderných zbraní: výzvy a budoucnost (Brno, 2011), 15.
[3] Rojčík, 26.

nuclear technology and nuclear science and promotes nuclear security standards and their implementation.

A significant step towards strengthening the power of the IAEA's verification were negotiations on the establishment and subsequent signing of the Treaty on the Non-Proliferation of Nuclear Weapons. Its foundation was a reflection of technological developments along with development in the area of proliferation.[4]

1.1.2 Non-Proliferation Treaty

The Threaty on the Non-Proliferation of Nuclear Weapons is an international treaty which aims to prevent the spread of nuclear weapons and weapon technology to seek cooperation in the peaceful uses of nuclear energy. The Treaty establishes a safeguard system under the responsibility of the IAEA. It was opened for signature in 1968 and entered into force in 1970. [5]

Until now, a total of 191 states have signed the Treaty, including five, which are recognized by NPT to be Nuclear Weapon States (People´s Republic of China, France, Russian Federation, United Kingdom and United States). Only four UN member states have never joined the NPT: India, Pakistan, Israel and South Sudan. North Korea joined the NPT in 1985, however, announced its withdrawal in 2003. All the mentioned non-NPT states, except South Sudan, had also aquired or are presumed to acquire nuclear weapon.[6]

The NPT consists of a preamble and eleven articles. Although the concept of "pillars" is not expressed anywhere in the NPT, the treaty is nevertheless sometimes interpreted as a three-pillar system, with an implicit balance among them:

1. non-proliferation,
2. disarmament,
3. the right to peacefully use nuclear technology. [7]

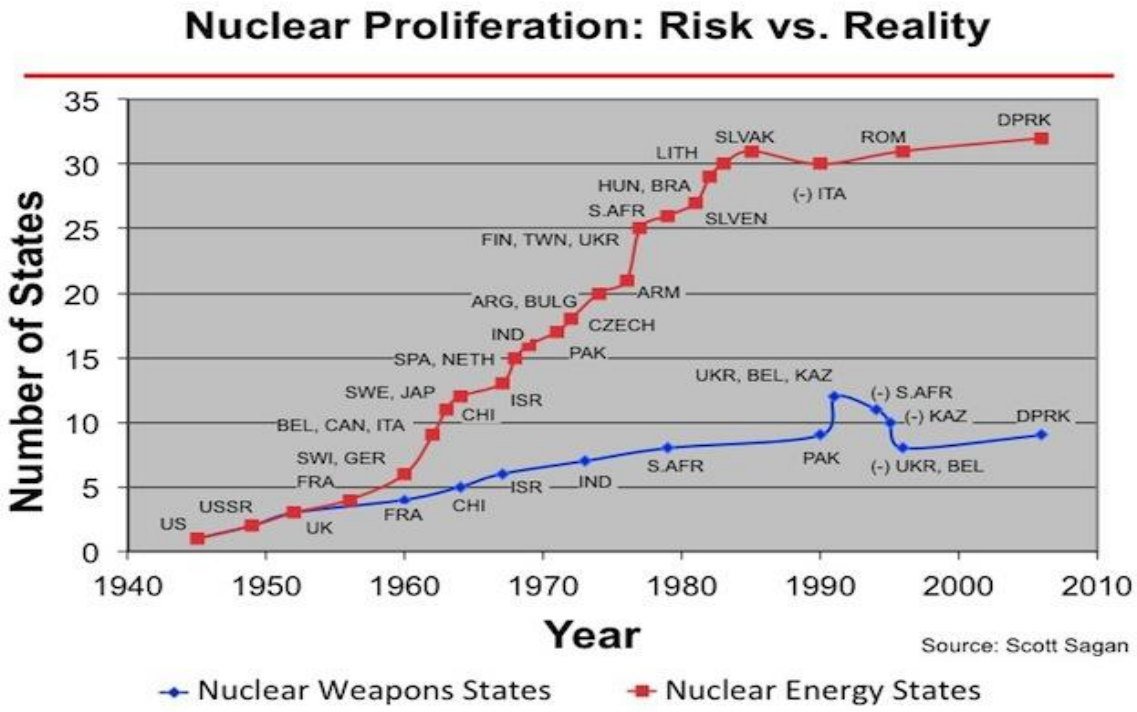
[4] Rojčík, 27.
[5] The Treaty on the Non-Proliferation of Nuclear Weapons (NPT), http://disarmament.un.org/wmd/npt/npttext.html, (10.12.14).
[6] Ibid.
[7] Ibid.

Although NPT has established a useful tool in limiting the proliferation of nuclear weapons, it failed to prevent e.g. the North Korean to develop its nuclear weapons. The main weakness of the treaty is seen in the Article IV, which declares that each State has "inalienable right" to research and produce nuclear energy for peaceful purposes without discrimination. Parties have the right to the fullest extent to participate in the exchange of technology, materials and science information for the peaceful uses of nuclear energy. States which has the nuclear capability then have to contribute to these efforts, particularly with regard to the developing world. The main weakness of this Article is the fact that the dividing line between peaceful nuclear programs and nuclear weapons programs contributing to the production of nuclear weapons is very thin, or rather permeable.

1.2 Actors in the nuclear arena

The United States did not manage to maintain a monopoly on its new weapon as the secret for making nuclear weapons spread very quickly. Four years after Hiroshima and Nagasaki, the Soviet Union detonated its first nuclear device, followed by the United Kingdom in 1952, France in 1960, and China in 1964.

Figure 1: Nuclear Proliferation development,



Source: http://www.forbes.com/sites/jamesconca/2014/09/25/the-nuclear-weapons-states-who-has-them-and-how-many/

In the figure above, it is seen that the number of countries that have commercial nuclear power increased significantly to 31, not including other nuclear energy emerging in states like the United Arab Emirates, Vietnam, Saudi Arabia and Jordan. On the other hand the number of countries that developed nuclear weapon incresed during the last 25 years only with Pakistan and the Democratic People´s Republic of Korea (North Korea). South Africa, Kazachstan, Belarus and the Ukraine halt their nuclear military program when the Soviet Union dissolved and the former Soviet satellites gave their nuclear weapons back to Russia.[8]

The states of immediate proliferation concern (also called "roughe states" by the US) are Iran and Syria. In 2003, IAEA concluded that Iran "had undertaken covert nuclear activities to establish the capacity to indigenously produce fissile material"[9]. Syria was acused of an inadequate cooperation with the IAEA on an investigation of its undeclared facility, which was destroyed by Israel in 2007 and on what "US officials have alleged was the construction site of a nuclear research reactor"[10]

The threat of proliferation does not come only from state actors and currently more and more atttention is dedicated to the terrorist groups. The use of nuclear weapons by terrorist is a topic which is often referred to a biggest threat. Terroris groups that have demonstrated interest in acquiring a nuclear weapon are Al Qaeda, Chechnya-based separatist, Lashkar-eTaiba and Aum Shinrikyo. Possibly, there are 5 terrorist groups which may be capable of acquiring and using nuclear weapon –Al Qaeda, North Caucasus-based separatists, Lashkar-e-Tayyib, Hezbollah and Taliban. With this regard, Hezbollah could represent the biggest concern as it is supported by Syria, roughe state.[11]

Although this option of nuclear weapon in terrorists´ hands should not be underestimated, there are several factors that makes it less likely. Development of weapon technology is extremely challenging and requires the ability to create, manage and maintain a comprehensive long-term project and necessity for extensive scientific and technical infrastructure. Financial requirements may also limit the efforts to acquire nuclear weapon

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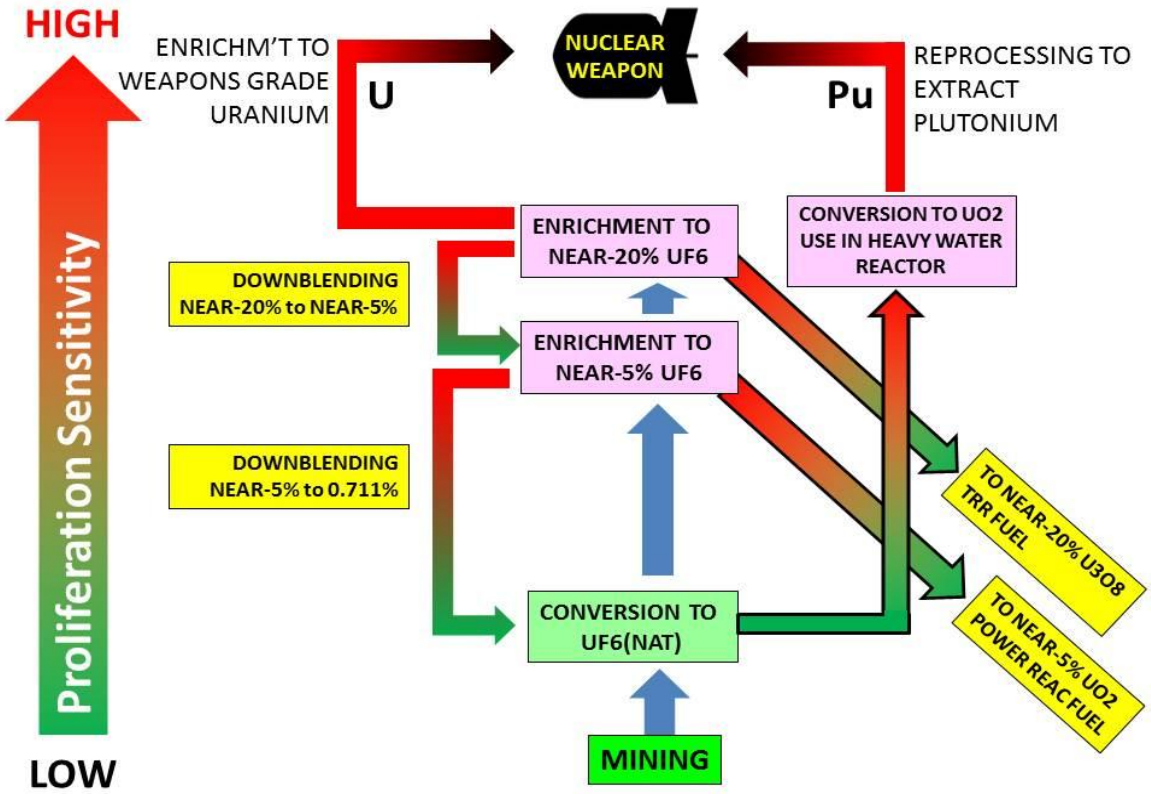
[8] James Conca, The Nuclear Weapons States – Who Has Them And How Many, http://www.forbes.com/sites/jamesconca/2014/09/25/the-nuclear-weapons-states-who-has-them-and-how-many/ (15.5.15).
[9] Ibid.
[10] Ibid.

and considering the fact that a major target of most terrorist groups is to gain attention and to spread fear, it is more feasible to use inexpensive conventional explosive than a costly nuclear weapon to mass killing.[12]

1.3 Dual use technology

Dual-use technology refers to the possibility of military use of civilian nuclear power technology. Many technologies and materials associated with the creation of a nuclear power program have a dual-use capability, in that several stages of the nuclear fuel cycle allow diversion of nuclear materials for nuclear weapons. When this happens a nuclear power program can become a route leading to the atomic bomb or a public annex to a secret bomb program.[13]

Figure 2: Sensitivity on Nuclear fuel cycle



Source: http://www.iranfactfile.org/2014/12/28/making-sense-iranian-nuclear-fuel-cycle/

[11]Graham Allison, Nuclear Terroritm Fact Sheet, http://belfercenter.ksg.harvard.edu/publication/20057/nuclear_terrorism_fact_sheet.html (20.4.15).
[12] Ibid.

In the figure above, it can be seen that almost the entire nuclear energy cycle and the technology it uses, copies the production cycle of military nuclear programs. The most visible example is an uranium enrichment technology using gas centrifuges. The nuclear fuel is required to enrich uranium to about 3.5-5%, to produce nuclear weapons it is the ideal number more than 90%. Technology in both cases is the same. To achieve a higher degree of enrichment is necessary to adjust the cascade of gas centrifuges so as to increase the number of steps in which the uranium fluoride is in gaseous form enriched. Gain enough fissile material quality is yet for a military nuclear program entirely a key issue because the subsequent construction of nuclear weapons is technologically less challenging (especially for a country that is capable of domestic production of fissile material). Therefore any state with appellation on its "inalienable rights" can build more than 90% necessary capacity to develop nuclear weapons.[14]

The important term in this connection is latency period. It means the time which is required for the nuclear energy states with the basic knowledge and some infrastructure to obtain or develop the rest to produce a weapon. For example Peru, with no nuclear energy and any kind of infrastructure does not have a latency period but on the other hand Sweden, which has nuclear energy but insufficient infrastructure has latency period 5 years to develop a sufficient infrastructure do produce a weapon.

1.3.1 Nuclear weapon technology

An atomic bomb is a containerized uncontrolled nuclear chain reaction that can be made from either U-235 and Pu-239, or both, the two elements that can be easily split apart to release a lot of energy. Since a reliable and effective bomb requires each element to be pretty pure (over 90% of either U-235 or Pu-239), one needs to choose the specific path for each. For a U-bomb the state need s to enrich the U-235 up to about 90%, way more then the 3% to 5% for a commercial reactor. However, in addition to needing many highly sophisticated centrifuges and associated technologies, it takes a lot of energy to enrich U-235 to weapons grade, a lot of electricity to spin that many centrifuges that fast.

To weaponize uran, it’s easiest to make a big gun assembly, put two separate globs of U-235 not large enough to go critical alone (about 40 lbs each) but when combined is more

[13] Rojčík, 18.
[14] Ibid.

than enough, pack propellant or explosives behind one of them, and at the right moment propel it into the other so it goes critical.

For a Pu-bomb, the state needs a weapons reactor to produce enough Pu-239, which needs to be separated from the other elements. To weaponize it, it needs to make an implosion assembly, put a smaller glob of Pu-239, only 15 to 20 lbs since Pu-239 fissions better than U-235, but that is not dense enough to go critical. Then pack high explosives around it so that when they explode, the Pu is compressed to super high density and goes critical. An implosion-type Pu-bomb is a lot more difficult to make than a gun-type U-bomb, therefore U-bomb is easier to make, but a Pu-bomb is better to have tactically.[15]

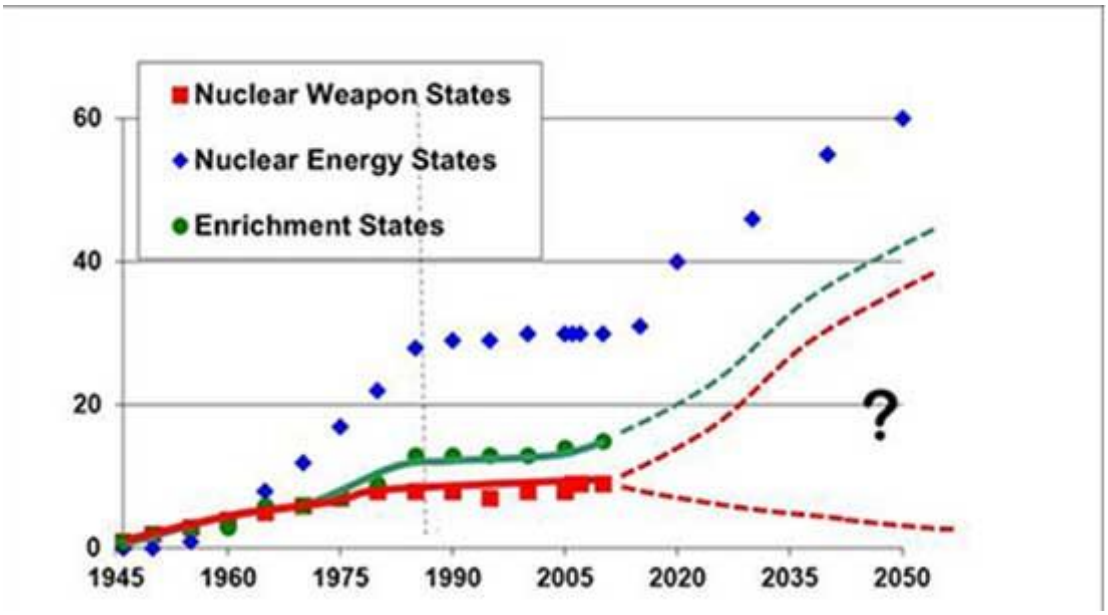
1.4 Scott Sagan – Why do States Build Nuclear Weapons?¨

After bombing of Hiroshima and Nagasaki, it was clear that the world is facing to a weapon with unprecedent power, however it took some time than the theoretics and politics realised that the logic of nuclear profliferation is not applicable on any of the military history as until that time, every essential martial invention was immediately implemented in the armaments of the all states, which were technologicaly and economicaly capable. The experts started prospecting proliferative theory that could explain what motives lead actors in international relations to the decision to gain and hold nuclear weapons.[16]

Table bellow depicts trends in acquisition of nuclear technology and weapons in the past and raises questions about possible future. Former predictions about rapidly increasing number of nuclear armed states appeared to be exaggarated, conversely nowadays tendency is to halt nuclear weapon program.

[15] Conca.
[16] Scott D. Sagan: Why do States Build Nuclear Weapons – Three Models in Search of a Bomb, in: International Security, Vol. 21, No. 3, Winter 1996/1997, p. 78.

Figure 3: Trends in acquisition of nuclear weapons



Source: http://www.aps.org/units/fps/newsletters/201210/pregenzer.cfm

It has been drawn large number of case studies helped to identify factors influence the decision to seek nuclear procurement, however the study demonstrated that motivation to acquire nuclear weapons vary in each individual case. Therefore comprehensive analysis of proliferatiove decision is rarely sufficient tracking only one of the factors.[17]

Although the motives of proliferation can vary, there is one argument which predominate among rational theorists of International Relationss. States are more likely to develop nuclear program seeking to acquire nuclear weapons if they are facing an external security challenge.According to profesor John M. Deutch:

"The fundamental motivation to seek a weapon is the perception that national security will be improved."[18]

This argument is supported by Scott Sagan, however, he claims that there are two other factors, which have to be considered to analyse state´s proliferative motives. The case of France is the eligible example. France developed its nuclear weapon due to its mistrust in US security guarantees after the Suez crisis. The reason why France decided to develop

[17] Sagan, 82.

such weapon was not exclusively based on security threat, but also because of its effort to return to its great power status which it partly lost during the WW2. Possessing the nuclear weapon seemed to be a great tool to demonstrate an economical and technological prestige. With Sagan´s words:

France emerged from World War II in an unusual position: it was a liberated victor whose military capabilities and international standing were not at all comparable to the power and status it had before the war. It should therefore not be surprising that the government of both the Fourth and the Fifth Republic vigorously explored alternative means to return France to his historical great power status.[19]

This explanation seems to provide a viable approach and refers to the fact, that some cases of proliferation cannot be understand by mono-causal explanations, addressing only an increased need of security. Considering these aspects, it seems to be advisable to use Sagan´s strong explanatory models to understand and analyse state´s nuclear intentions.

The debate on the proliferation of nuclear weapons has therefore gradually evolved into a several theoretical orientations that differ mainly on what kinds of proliterative motives they stress.

" Nuclear weapons, like other weapons, are more than a tool of national security; they are political objects of considerable importance in domestic debates and internal bureaucratic struggles and can also serve as international normative symbols of modernity and identity".[20]

By the qoute above, Scott Sagan, indicates three main theoretical approaches to explain the process of nuclear proliferation.

1.4.1 The Security Model

According to Sagan:

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[18] John Deutch: The Nuclear Threat, in: Foreign Affairs, Vol. 71, No. 41, Fall 1992, pp. 124 – 125.
[19] Sagan, 78.
[20] Ibid.

"[…] States build nuclear weapons to increase national security against foreign threats, especially nuclear threat."[21]

This model essentially corresponds to the dominant neorealistic explanation of proliferative motivation. The oldest approach, based on realistic and neorealistic models, works primarily with motivation of the uncertainty that actors face in the international environment. Realists state that if an actor evaluate security risk as high, it will try to obtain the most efficient existing means to ensure its own survival.

This means that if the country would face a security threat, it would be more likely to decide to obtain nuclear weapon arsenal to stay in balance with its rivals. If the country is not technically or economically selfsufficient to develop such arsenal, it could seek for a cooperation with some of the nuclear powers. The statement, however, indicates that if the country is not or no longer facing an external threat, it would refuse to develop military usable nuclear technology.

1.4.2 The Domestic Politics Model

"The domestic politics model, […] envisions nuclear weapons as political tools used to advance parochial domestic and bureaucratic interests."[22]

The Domestic politics model focuses on internal determinants and take into account the complexity of the decision-making process within the political system of individual states, the role of the bureaucratic apparatus, interests of the groups or individuals, and many other phenomena that previous approaches ignored. In connection with this logic, Scott Sagan introduces three main domestic actors: The nuclear energy establishment of a country, the military as domestic bureacratic actor and politicians. From the perspective of this theory, the production of nuclear weapons is not inevitable response to external security threats but can reflect political changes and struggles.

[21] Sagan, 55.
[22] Sagan, 57.

1.4.3 The Norms Model

Nuclear weapons decisions are made because weapons acquisition, or restrain in weapons development, provides an important normative symbol of a state's modernity and identity.[23]

According to this model, nuclear weapons are used primarily as a symbol reflecting national identity. The proliferation of nuclear weapons is explained through the concepts such as national standards or identity of the state. The model therefore point out that nuclear weapons have important symbolic function and by their acquisition actors demonstrate how they want to be seen in the international arena. Following this statement, possession of nuclear weapons can mean prestige and demonstration of highly developed technologies.

1.5 Concept and Methodology

The risk of nuclear proliferation is connected with the issue of understanding why states pursue to aquire nuclear weapons in the first place. Being aware of the proliferative motives of the state can provide proposals to stop the spread of nuclear weapons.

This diploma thesis will test Sagan´s theory on the case studies of the selected countries, trying to answer the questions: Do Sagan´s model provide reliable tool to predict state´s intentions? Do the selected countriess, according to Sagan´s theory, want to develop a nuclear military program seeking to construct nuclear weapon? And Do these countries pose a threat for the West?

The goal of the diploma thesis is to analyse available sources to evaluate state´s intentions with respect to their nuclear program. Empirical analytical approach and historical method will be used to describe the issue. In recommendation part, the collected information will be use to assess the state´s intention with ambition to suggest possible ways how to deal with the issue.

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[23] Sagan, 55.

The information and data will be gain from available literature and online sources. As core sources of information and inspiration will be use these publications and serves:

- IAEA.org
- NTI.org
- CFR.org
- Vojenskerozhledy.cz
- Oliver Shmidt´s Dissertation on the topic: Understanding and Analysing Iran´s nuclear Intentions

The main obstacle in the analysis could be general lack of reliable publicly available information. Especially for the Libyan case, there is very little actual information about its current nuclear program. At the same time, due to non-stable situation in the arabic world nowadays, the text has not ambition to provide a prediction whether the countries will actually build a nuclear weapon or even when it could happen.

2 ANALYSIS OF THE SELECTED COUNTRIES

The following paragraphs compiles background information on the status and development of nuclear power programmes in the selected countries. To analyze the proliferative motives, it is necessary to be aware of the development in the nuclear field and technical capability. Only the combination of capability and intentions allows an assessment as to whether the countries constitutes a threat.

2.1 Iran Nuclear capabilities

The Islamic Republic of Iran is on the US Department of States listed as state sponsor of terror.[24] Its support in the conflict areas in Afganistan and Iraq and further for political violence movements in Lebanon and Palestinian Territory, became a subject of international inquiry. Moreover, Iran´s failure to report important parts of its program to IAEA, was found in non-compliance with its Comprehensive Safeguards and Agreement and many states are getting suspicious that Teheran´s intentions are not exclusively peaceful.[25]

President George W. Bush mentioned Iran in his Axis of Evil Speech and urgues that

"The greatest danger of freedom lies at the crossroads of radicalism and technology" and that *"even weak states and small groups could attain a catastrophic power to strike great nations"*[26]

Additionaly, the strategic importance of the Persian Gulf to global energy security and related tense relations, hostility and rivalry between Iran and USA and Iran and Israel could escalate into a military confrontation.

Some hopes for ease the tension brought the victory of Hassan Rouhani in Iranian presidental elections in 2013. Under his leadership, Iran began to cooperate with the West and approached to bilateral talks with subsequent agreement on Joint Plan of Action. By these steps, Iran is promised to be reliefed of limited sanctions in exchange for obligation to halt the enrichment activities. The negotiations are still in progress as parties were not able

[24] US Department of State: Country Report on Terrorism, Chapter 3, State Sponsors of Terrorism Overview, 30 April 2007, http://www.state.gov/s/ct/rls/crt/2006/82736.htm (25.4.15)
[25] Gitty M. Amini, Weapons of Mass Destruction in the Middle East, http://www.nti.org/analysis/articles/weapons-mass-destruction-middle-east/ (30.4.15)

to agree on several key issues yet, especially on acceptable capacity for enrichment plants for Iran.

Although potential improvement of the situation, the regional ambitions of Iran and maybe its self-assurance and need for prestige means that Iran´s nuclear program will continue to be one of the key global security issues.

2.1.1 Development of nuclear program

The nuclear program of Iran was slow to progres at the beginning although Teheran was provided the small 5MWt research reactor by the United States already in 1967. In these circumstances, Iran was willing to sign the NPT in 1968. Under the leadership of Mohamed Reza Shah, Iran pursued to fullfil ambitious nuclear plans and concluded several contracts with US, French and German companies. Purchased uranium yellowcake from South Africa and invested in training and education of its personel in nuclear field. However, a lot of newly educated talents left the country after the Iranian Revolution in 1979. This loss together with new successor´s ideology resulted nearly in decomposition of the developing nuclear program. [27]

After costly war with Iraq during the years 1980-1988, Khomeini reverse on the issue and Iranian leaders began refocusing on nuclear program and started to seek interntational partners with intention to aquire nuclear technology. Long-term cooperation agreements with Pakistan and China brought to the country new trained personnel and promise of miniature neutron source reactor and two power reactors. Nonetheless the cooperation was later blocked by US Government as Iran was suspected to use the civilian nuclear program as a cover for development of nuclear weapons.[28]

In 1992 Iran signed a bilateral nuclear cooperation agreement with Russia and three years later agreed to continue building the Bushehr-1 nuclear power reactor. Russia also allegedly offered to provide Iran with a large research reactor and technologies capable to enrich uranium. US officials expressed concerns about suspected intentions of the Russia-Iranian cooperation and obliged Boris Yeltsin to scale back the cooperation.

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[26] President Bush, West Point, New York, 01.06.2002, in: The National Security Strategy of the United States of America, September 2002, p 17, <http://www.whitehouse.gov/nsc/nss/2002/nss.pdf> , (14.05.15)
[27] David Albright, Jacqueline Shire, and Paul Brannan, "Is Iran Running out of Yellowcake?" The Institute for Science and International Security, 11 February 2009.

In 2002 , IAEA began investigating allegations that Iran conceal some undeclared nuclear activities including "Natanz Enrichment Complex, the adress of Electric Company, a heavy water production plant under construction in Arak and the names of various individuals and front companies involved in the nuclear program." Therefore following years Iran undergone IAEA scrutinies with questions on history of its nuclear program.

In 2003 Iran began negotiating with EU-3 (France, Germany, the United Kingdom) to find diplomatic solution and to escape from refferal to the UN Security Council and subsequently signed the Additional Protocol and promised temporary suspension of enrichment and conversion activities. Nevertheless, in 2004 IAEA received documentations indicating that Iran „was modifying the nose cone of its Shahab-3 missile to carry a nuclear warhead" and „had hidden blueprints for a more advanced P-2 centrifuge". Under the weight of evidence Iran amended its previous statement and acknowledged that it had obtain the P-1 through a intermediary and that the P-2 centrifuge imported in 1994.

Further hopes on diplomatic progress, however, fell apart in 2005 when Iran rejected the agreement with EU-3 as found the demands too heavy and light on incentives. Both sides performed another diplomatic retreat maneuvers during the following year but at the end Iran quit implementation of Additional Protocol and proceeded its enrichment activity in Natanz. Also other negotiations with United States, Russia, France, the United Kingdom, China and Germany (P5+1, or E3+3) failed and tensions further increased after President Ahmedinejad informed IAEA about his intentions to construct 10 more uranium enrichment facilities. Another set of sanction from UN Security Council together with increased US pressure on the IRISL came in the following years but negotiations to resolve the Iranian nuclear issue progressed not until the year 2013. [29]

Hassan Rouhani´s victory in Iranian presidental elections brought new hopes for ease of the tension. Secret bilateral talks and subsequent first direct talk between U.S. and Iranian leaders since the 1979 revolution set the basis for resolution and in November 2013 Iran and the P5+1 anounced agreement on a Joint Plan of Action (JPOA). Moreover, Iran and IAEA agreed on Framework for Cooperation (FFC). This ment that Iran was obligated to

[28] Iran's Strategic Weapons Programmes: A Net Assessment (London: The International Institute for Strategic Studies, 2005), p. 9.
[29] Iran´s Programmes, 13.

implemet several interim steps including suspending enrichment activities in return of relief limited sanctions.

Since the JPOA went into effect, Iran converted its stock of 20% UF6 to material forms considered as less proliferation sensitive because „multiple steps would be required to convert the material back into near 20% UF6, which can be directly enriched further to weapons grade level". While representatives of the Iran and P5+1 are rather optimistic, negotiations are still in progress as parties failed to reach a comprehensive accord and common ground on several key issue „namely a mutually acceptable capacity for Iran´s enrichment plants and the ultimate duration of a final deal".[30]

2.1.2 Technical Aspects and Nuclear facilities

The following paragraph will describe some nuclear facilities in Iran and their functions including possible options for missusing them for military purposes.

Iran has its own natural uranium mines at the Saghand and Gchine. The ore is next processed in Yellowcake Productionn Plants in Ardakan and Bandar Abbas. It is currently not clear if the facilities are fully operational, however, these facilities could provide the production about 83-93tons of yellowcake[31] per year which is not sufficient as approximate amount of yellowcake, which is annually required in civilian power plant at Bushehr is 235 tons. Iran has two facilities for the enrichment process in Natanz, the pilot fuel enrichment plant and fuel enrichment plant. From the non-proliferation perspective, the technology for enrichment uranium is critical for the ability to produce weapon-grade uranium. By using approximately 9000 operating at Natanz, Iran could hypothetically produce enough weapon-grade uranium to fuel a nuclear warhead in 2 months. Furthemore, current stockpile of low-entriched uranium is sufficient for further enrichment to fuel around seven nuclear warheads.

Currently, there are four research reactors operating in Iran, three of them are light-water reactors and one is a heavy-water reactor. None of them is considered as a proliferation threat due to small amount of nuclear fuel used and waste produced. The Iran´s decision to build a heavy-water research reactor and heavy-water production facility

[30] Burgess Everett, "Samantha Power urges GOP Congress not to pursue Iran sanctions,"*Politico*, January 12, 2015, www.politico.com.

in Arak raised concerns about Iran´s intention. The reactor is presently under construction but is estimated to be able to produce 11-14kg of plutonium per year. The amount needed for an implosion model of atomic weapon is about 6-8kg.

Finaly, it is necessarry to assess military facilities in Iran which would be theoretically feasible to be involved in nuclear program. The Nuclear Threat Initiative (NTI) announced that there are three facilities, where nuclear weapon related research could take place. First is Iranian Revolutionary Guards Corps (IRGC) facility located in the northwest of Teheran, second is Goran al-Kabir Center in Goran and third is military facility in Parchin.[32] Especially the complex at Parchin preoccupied the IAEA in 2004, when reports surfaced that a large explosives containment vessel had been built at this location to conduct hydrodynamic experiment. The IAEA announced several suspicious activities regarding the research and testing of high explosives, detonators and underground testing arrangements, which could possibly be used for the development of nuclear explosive device and appealed to Iranian authorities to give clarification. The Iranian response was:

"The documents do not show any indication that the Islamic Republic of Iran has been working on nuclear weapons. The Islamic Republic of Iran has not had and shall not have any nuclear weapon program."[33].

Despite the Iran´s proclamation about peaceful usage of civilian nuclear power, the IAEA requested access to the complex again in 2011 and observed extensive landscaping, demolition and new construction at the site.[34] Currently, there are still many reasons, including uncertainties about the number of centrifuges that Iran is operating, why IAEA should be viligant about Iranian intentions.

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[31] Yellowcake is a type of uranium concentrate powder obtained from leach solution in an intermediate step in the processing of uranium ores

[32] The Nuclear Threat Initiative (NTI) Country overviews: Iran – Nuclear Facilities, www.nti.org/e_research/profiles/Iran3119_3130.html, and www.nti.org/e_research/profiles/Iran3119_3132.html (20.05.15).

[33] IAEA Board of Governors: Report GOV/2008/15: Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolution 1737 (2006), 1747 (2007) and 1803 (2008) in the Islamic Republic of Iran, Section E. Paragraph 18, 26 May 2008. (Accessible at www.IAEA.org)

In the table bellow, you can see the list of all Iranian nuclear principal facilities.

Table 1: Iran´s facilities

Facility	Purpose	Location	Status	Supplier
Uranium Mines	extraction of uranium ore	Saghand, Gchine	operational	allegedly China
Yellowcake Production Plants	production of uranium concentrate	Ardakan, Bandar Abbas	operational or under construction	
Uranium Conversion Plant (UCF)	uranium conversion	Isfahan Nuclear Technology Center (ENTC)	operational	China supplied blueprints
Pilot Fuel Enrichment Plant (PFEP)	uranium enrichment with gas centrifuges	Natanz	operational	A.Q.Khan network provided centrifuge blueprints and components
Fordow Fuel Enrichment Plant (FFEP)	uranium enrichment with gas centrifuges	near Qom	partially operaional	
Fuel Enrichment Plant (FEP)	uranium enrichment with gas centrifuges	Natanz	partially operaional	A.Q.Khan network provided centrifuge blueprints and components
Heavy Water Production Plant	production of heavy water, used as a moderator in nuclear reactors	Arak	operational	Russia helped with know-how
Heavy Water Research Reactor (IR-40) (40MWt)	production of radioisotopes, by products include plutonium	Arak	under construction	
Light Water Power Reactor (1000MWe)	electricity production	Bushehr	completed, not operating	Germany and Russia
Tehran Research Reactor (TRR) (5MWt)	radioisotope production	Tehran Nuclear Research Center	operational	United States

[34] Iran´s key nuclear sites, http://www.bbc.com/news/world-middle-east-11927720 (13.4.15)

Jabr Ibn Hayan Multipurpose Laboratories (JHL)	research, including on uranium metal development	Tehran Nuclear Research Center	operational	
Molybdenum, Iodine and Xenon Radioisotope Production Facility (MIX Facility)	radioisotope production	Tehran Nuclear Research Center	operational	
Fuel Manufacturing Plant (FMP)	manufactures fuel for the Arak reactor	Isfahan Nuclear Technology Center (ENTC)	operational	
Fuel Plate Fabrication Plant (FPFP)	manufactures fuel for the TRR	Isfahan Nuclear Technology Center (ENTC)	operational	
Miniature Neutron Source Reactor (MNSR) (30 kWt)	reportedly for isotope production	Isfahan Nuclear Technology Center (ENTC)	operational	China
Heavy Water Zero Power Reactor	research	Isfahan Nuclear Technology Center (ENTC)	operational	China
Light Water Sub-critical Reactor (LWSCR)	research	Isfahan Nuclear Technology Center (ENTC)	operational	China

Source: http://www.iranwatch.org

2.1.3 Assessing the capability

Despite slow commencement, Iran´s nuclear program has progressed significantly during the past decade, with developed nuclear infrastructure, uranium mining and enrichment capability. Hypothetically, Iran has the scientific, technical and industrial capacity to produce nuclear weapons. According to the IISS assessment, if Iran decided to do so, it would presumably select the implosion technique, as smaller amout of nuclear material is needed and it is more feasible to be used for missile delivery.[35] Its "latency period" is estimated to 6 months. Although Teheran will be technically capable of producing and reprocessing enough plutonium yet, it has to be considered the high risk of detection by the IAEA or other intelligence agencies, especially nowadays, when Iran has the full

[35] The International Institute for Strategic Studies (IISS) – IISS Dossier: Iran's Strategic Weapons Programmes – a net assessment, Routledge Taylor and Francis Group, Abingdon, New York, 2005, p. 63.

international attention. However, regarding these facts it has to be concluded that Iran could represent a proliferation risk in the future due to its technical capability.

2.2 Nuclear capabilities of Syria

Syria has one of the most advanced chemical warfare capabilities in the Middle East, on the other hand, its nuclear infrastructure is very limited with possessing no power reactor, insufficient number of trained stuff and lacking funds. Despite these limitations and potential incapability to engage a large scale nuclear military or civilian initiative, Syria showed interest in an acquisition of unconventional nuclear and particulary chemical weapons. The Syrian desire to run "weapons-oriented program" required dependence on external assistance, according to NTI Reports. The most concerning to the West is the likelihood that Syria could look towards the assistance of Iran, because living under Teheran´s nuclear umbrella would be very economically and technologically feasible solution.[36]

According to US officials, Syria has previously relied on North Korean and Iranian assistance for its missile programs and the cooperation lasts till now.[37]

Although, there is no public evidence that Iran, North Korea and Syria are engaded in nuclear related trade, the concerns about this deepend in the year 2007, after Israelan airstrike of suspicious facility in Al Khabar. North Korean and also Iranian experts are believed to be involved in this project. According to Majid Rafizadeh, an Iranian-American political scientist:

"It is crucial to point out that, without a doubt, becoming a nuclear state for the Syrian and Iranian government would be a formidable tool in to suppress opposition, maintain power, and deter foreign intervention in case of crimes against humanity."[38]

In addition, another international concern is that the potential nuclear enriched material might fall in the hands of radical islamic groups. As recently Western intelligence publicated the assessment, that Syria pursue to renew its operations in a nuclear facility near Quaser

[36] Debalina Ghoshal, If Iran develops Nuclear Weapon, Syria could come uncer its nuclear umbrella, http://www.diplomaticourier.com/news/regions/middle-east/2465-if-iran-develops-nuclear-weapons-syria-could-come-under-its-nuclear-umbrella (25.4.15)
[37] Majid Rafizadeh, Iran- Syria-North Korea Nuclear Nexus, http://www.frontpagemag.com/2015/majid-rafizadeh/iran-syria-north-korea-nuclear-nexus/ (12.3.15)

pointed out that the reconstruction could be conducted not only with assistance of Iran and North Korea but also with the helping hand of Hezbollah.

2.2.1 Development of nuclear program

Syria became a member of the International Atomic Energy Agency (IAEA) in 1963. Possibly motivated by looses in Six Day War (1967), in which escalating tension between Israel and its Arabic neighbours culminated into airstrike against Egypt and consequent loose of Syrian Golan Heights, Syria signed and ratified the Nuclear non-proliferation Treaty (NPT) in 1969. The early entrant to the NPT, however, compared to other Middle Eastern states, embarked on its nuclear programme quite late. Syria founded the Scientific Studies and Research Center (SSRC) in the early 1970s and only in 1976 established Atomic Energy Commision in Syria (AECS), the regulatory authority responsible for peaceful utilization of atomic and nuclear technologies. Reasons, why did Syrian authorities suddenly manifested its interest in nuclear program could be two. On the one hand Syria´s increasing domestic energy demand with prompts to considering nuclear option for electricity generation and on the other hand pursuing a hedging strategy, as a nuclear weapons program could be seemed as a possible option for achieving parity with Israel.

Nonetheless, during the early 1980s Syria realized that is incapable of producing nuclear reactor only from the domestic resources and vigorously pursued external assistance to acquire reactor. Negotiations with French firm Sofratome were unsuccesseful due to Syrian lack of the resources to finance the reactor as well as approaches to USSR in 1985 where yeilded plans for construction of two research reactor retired and project remained in the design phase.[39]

In 1990, Syria concluded a nuclear agreement with Argentina, however, the Argentian government vetoed it in 1995 announcing that a special nuclear treaty with Syria was essential to the fullfilment of the deal. Argentina was purportedly under the pressure from both the United States and Israel. Guido Di Tella, then Argentinaś Foreign Minister, stated that he was aware of the challenges to the sale and that „not only do we have to judge that

[38] Ibid.
[39] "IAEA Briefs U.N. Security Council on Syria Dispute," Global Security Newswire, 15 July 2011.

it is not interfering with the process or security, but both Israel and Syria must believe the same".[40]

The first succes in nuclear ambitions came in 1991 when China constructed Syrian first SRR-1 research reactor at Dayr Al Hajar (or Der Al-Hajdar). The reactor was designed after Canadian Slowpoke 2 reactor and is used for neutron activation analysis (NAA), training, and small-scale radioisotope production. In 1992 Syria negotiated a Comprehensive Safeguards Agreement with the IAEA so the reactor went critical in 1996. Although controversy and allegations on Chinese and Syrian cooperation were unclear, various members of the international community remained insecure about sensitive technology transported to Syria. For example, the deal between Russia-Syria Commision on Trade and Scientific and Technical Cooperation of project for the peaceful use of nuclear power in 1998 did not progress and was shelved under U.S. pressure, similarly to the Argentinean negotiations. In 2003, Syria signed another nuclear deal with Russia but received an extensive amount of negative attention that the contract failed again. At present, there is not known any cooperation with Russia concerning of nuclear power. However, there was limited open sources information for concern about Syrian nuclear weapons program prior the year 2007.

In September 2007, the Israeli Airforce bombed and destroyed a suspicious building in northwestern Syria near the Euphrates River, a facility with characteristics similar to the nuclear facility at Yongbyon in North Korea. The incident provoked questions concerning whether Syria had something to hide. These speculations were supported with the fact that although Syria denied any allegations and claimed that the building was a military non-nuclear instalation, during the investigation did not cooperate with the IAEA sufficiently and leveled what remained after the airstrike. [41]

While Syria remained silent, the United States and Israel provided the IAEA with photographs taken prior the bombing. On the basis of the photographs and analysis of other radar imaginary, IAEA announced that the destroyed facility "was very likely a nuclear reactor". Later, On 9 June 2011, IAEA published a resolution, that Syria did not comply the

[40] Nuclear Programmes in the Middle East: In the Shadow of Iran, ed. Mark Fitzpatrick, (London, UK: International Institute for Strategic Studies, 2008), pp. 73-82; Stockholm International Peace Research Institute, "Syria: Country Profile," www.sipri.org.

obligation under its Safeguard Agreement and failed to declare the construction of a nuclear reactor, and reported the case to the UN Security Council.

The outbreak of civil unrest against the regime of Bashar al-Assad during the March in 2011 impedes futher investigations and complicates acces to the Dair Alzour site. Experts and policymakers urgued IAEA, with reference to INFCIRC/153, to seek special inspection that would ensure acces to the key locations but Director General Yukia Amano decided to not ask the Board as this move can provide a risk that Syria would futher isolated itself.

In 2013 was released a video footage by Syrian rebels demonstrating that they took control over the Dair Alzour facility. The video also suggesting that the site "is now being used as a stationary launch site for short-range SCUD ballistic missiles."

2.2.2 Technical aspects and Nuclear facilities

The Atomic Energy Commission of Syria (AECS) was founded in 1976 in order to cooperate with IAEA on technical projects and nuclear energy feasibility studies.

During the 1980s, Syria seek to ensure itself an uranium supply and began researching processes to recover uranium from phosphate rock as it possesses significant deposits of phosphate rock and conducts mining at several locations, including Charkia and Knifes. Damascus´ intention was to build a facility which would also include an industrial scale uranium extraction as well as refining, conversion, enrichment and fuel fabrication. The IAEA approved a technical cooperation with Syria in 1986 and provided country with the uranium recovery micro-pilot plant at Homs in northeast of Damascus. The facility was completed in 1992 and remains operational today. Later in 2001 the IAEA further help Syria to improve its technical proces for recovering uranium and completed the phosphoric acid pilot plant at Homs. Original aim of this project was to remove uranium and other risk materials in order to purify the phosphoric acid for fertilizer, however the side effect was "hundreds of kilogram" of yellowcake.[42]

One of the main nuclear research facility is the Der Al-Hadjar Nuclear Research Center near Damascus, which houses Syria´s only research reactor, the SRR-1 Miniature Neutron Source Reactor. The facility is periodically subjected to the IAEA inspections, however in

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[41] Leonard S. Spector and Avner Cohen, "Israel's Airstrike on Syria's Reactor: Implications for the Nonproliferation Regime," Arms Control Today , Volume 38, no 6, July/August 2008.

2008, the environmental samples revealed presence of particles of anthropogenic uranium which were not declared by Syria before.

As was mentioned, the most controversial was facility known as the Al-Kibar, which was destroyed by Isreael in 2007. The facility had allegedly concealed 25MWth gas-cooled graphite-moderated nuclear reactor, which would have been theoretically capable of producing enough plutonium for two weapons per year. The airstrike, however, did not destroy Syria´s nuclear weapon capability as was thought and it seems that Bashar al-Assad is still trying to built the bomb in secret and possibly with the helping hand of Iran and North Korea. Moreover, according to recent IAEA research, Syria possesses up to 50 tons of natural uranium, which is enough to develop five bombs once the enrichment procedure is completed. In this regard, the Institute for Science and International Security in Washington D.C. expressed its worries:

"This large stock of natural uranium metal poses nuclear proliferation risks," the institute wrote. "It could be obtained by organizations such as Hezbollah or al-Qaida or undeclared nuclear programs of states such as Iran."[43]

Further, in 2015 Der Spiegel reported on an suspicious underground location near the city Qusayr. The facility is allegedly disguised from the very beginning with disposed material of various site and military guardiance at the entrance to the facility. According to unconfirmed informaton, Syria obtain 8000 fuel rods, which are stored there. Recent satellite images also revealed the structure of the facility: a guard house with five sheds. Particularly suspicious is the deep well connection with the nearby facility Zaita Lake. Although this connection is worthless for conventional weapons cache, it could point on nuclear facility. Currently, there are not any reliable proofs that the facility is used for nuclear activities or is misused for military purposes, however, it deserves international attention.[44]

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[42] IAEA, "Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic," Report by the Director General to the Board of Governors, GOV/2011/30, May 24, 2011.
[43] Eric Follath, Evidence Points to Syrian Push for Nuclear Weapons, http://www.spiegel.de/international/world/evidence-points-to-syria-still-working-on-a-nuclear-weapon-a-1012209.html (20.5.15).
[44]Nuclear Weapons Programs, http://www.globalsecurity.org/wmd/world/syria/nuke.htm (13.4.15).

Table 2: Syrian facilities

Activity	Characterization	Location
U supply	Deposits of phosphate rock with commercial fertilizer plant and uranium recovery micro-pilot plant at Homs	Charkia Knifes
Fuel fabrication	No	
Reactors	No	
Reprocessing	Research reactor SSR-1 (30kW), used for production of medical isotopes and research	
Waste disposal	Radioactive waste management	Der Al-Hadjar
Pu productionn capability	No	
Main nuclear research facilities	Der Al-Hadjar Nuclear Research Center and the Scientific Studies and Research Center	Damascus

Source: http://www.nti.org/country-profiles/syria/facilities/

2.2.3 Assessing the capability

Prior to the eruption of civil violence in 2011, analysts identified several factors, which may have point to the fact that Syria pursue a covert nuclear weapons program. At present, Syria does not seem to be capable of nuclear proliferatin activities. Due to the civil unrest in the country, lack of financial capacity and inadequate infrastructure to develop a nuclear device, Damascus would more likely focus primarily on civilian research, however any near-term progress in this field is also unimaginable. Even if the civil violence subsides, the Syrian government would have to deal with more immediate economic and political priorities. On the other hand, its strategic alliance with Iran raised important questions. As it is fact that Syria is incapable of operatin a large-scale program without significant external assistance. Technological and economical capabilities are therefore currently insufficient to produce a nuclear weapon without an external help.

2.3 Nuclear capabilities of Libya

In December 2003, after several months of negotiaions, Libya admit that in contravention with obligations under the NPT had seek a nuclear weapon program and agreed to halt its development with elimination of all equipment, materials and programs aimed at construction of nuclear or other proscribed weapons. Although the international Atomic Energy Agency had not been fully aware of Libyan covert activity prior to this time, it early became clear that despite its attempts, Tripoli was still many years from its nuclear weapon capability because of its insufficient expertise as well as underdeveloped scientific and industrial infrastructure.[45]

In October 2011, was killed the longtime dictator Colonel Muammar Gaddafi by insurgents. Currently Libya faces political deadlock and deteriorating security situation. The Second Libyan Civil War is an ongoing conflict between organizations pursuing the control Libya and the damage and disorder from the war is considerable. Its little business activity and a loss in oil production hurts its economy and its hardly to expect, that in this situation Libya will seek to develop nuclear weapon. On the other hand, there is a possibility that the new qoverning actor could be interested in nuclear capabilities in order to stabilize and improve the position in the region.[46]

2.3.1 Development of nuclear program

Libya signed the NPT under the regime of King Idris al-Sanusi in 1968 and although Idris was overtrown the following year, Libya ratified the NPT in 1975 by the Revolutionary Command Council headed by Colonel Muammar Qadhafi. In the years between signing and ratyfying the Treaty, Libya supposedly purchased several hundred tons of natural uranium (yellowcake) from Niger, without subjecting the deal to IAEA authorities. With adopting strong anti-Israel stance after Six Day War, Libya began seek its nuclear weapon capability. In the 1970s Libya failed in its first attempts to purchase nuclear weapon from China and allegedly from India in 1978. There were also many speculations on nuclear negotations between Libya and Pakistan in conjunction with Libyan assistance to Pakistan in obtaining

[45] Richard Spencer, "Libya's Liberation: Interim Ruler Unveils More Radical than Expected Plans for Islamic Law," *The Telegraph,* 23 October 2011, www.telegraph.co.uk; Alice Fordham, "Libya Looks Cautiously Toward Elections," *The Washington Post,* 11 November 2011, www.thewashingtonpost.com.
[46] Vivienne Walt, How Did Gaddafi Die?, http://world.time.com/2012/10/18/how-did-gaddafi-die-a-year-later-unanswered-questions-and-bad-blood/ (16.4.15).

uranium ore concentrate (UOC) and following nuclear assistance to Libya in return. However, similar to Syrian-China cooperation, these reports remain unclear. Partial succes met Libya with legally obtain the 10MW nuclear research reactor at Tajura from the Soviet Union. Later evidence released that Tajoura appeared as a main location of undeclared activities including early work on gas-centrifuge enrichment, conversion of uranium and plutonium separation. At this time Libya seek also to buy a reactor larger than this in Tajoura and dealt with France to purchase of a 600MW reactor, however the project was canceled due to strong objections by international community.

In 1980s Libya negotiated with Belgium firm Belgonucleaire on purchasing of a plant for manufacturing uranium tetrafluoride, yet Tripoli was not able to declare any facility with capacity to require this material and the purchase was refused. Nonetheless these efforts did not remain vain and Libya later admit that it had obtain a pilot-scale uranium conversion facility in 1984. Later in 1980s, in time when things were not scrutinizing very carefully, a foreign expert, reportedly employee of the German company, began an experimentation in Tajoura on developing gas centrifuges for uranium enrichment. Albeit, when he concluded his work in 1992 and left, Libya obtain technical expertise for the further development, but the program lost momentum and was reeastablished after 1995.

By the early 1990s, when culminating tension in the Soviet Union together with economy crisis led in its collapse, Libya allegedly attempted to exploit occured chaos to gain access to former Soviet nuclear technology and materials as well as to recruit some of its expertise. Nevertheless, Libyan participation on an international terrorism and bombing on Lockerbie led in imposition with UN economic sanction along with restrictions on foreign trades and presumably funds on nuclear program. This decelerated the development of nuclear capability until the year 1997 when Libya pursue to gain weapons grade fissile material on the black market and at the same year began to receiving nuclear-weapon aid from Pakistani chief architect Dr. A.Q.Khan and finally reopened nuclear cooperation with Russia. These steps met with partial succes and in the late 2000 Libya was able to order the capabilities to enrich uranium. Moreover Libya had the ambition to gain the know-how to design and fabricate the nuclear weapons. According to IAEA these documents were reportedly provided by Pakistani.

At the same time, when Libya pursued the equipment for centrifuge plant, Qadhafi began overturning to the West. According to the analyst, after September 2001, Qadhafi manifested desire to make peace with the United states because of impending U.S. invasion

of Iraq. Libya wanted to not only avoid Iraq´s fate but also nearly thirty years under U.S. sanctions significantly influenced the oil exports and so Libyan economy. Therefore in December 2003 Tripoli announced that it was giving up its pursuit of nuclear weapon and commited to disclose and dismantle all facilities and components connected with its WMD program.

With opose to Syria, the Libyan willingnes to fully cooperate with IAEA and its transparent response led to resolution that the country will be subjected to routine IAEA ispections. This conclusion enabled Libya to improve international diplomatic relations and to engage in bilateral agreements on peaceful application of nuclear technology.

2.3.2 Technical aspects

Libya's nuclear enrichment program was at an early stage. According to IAEA investigation, Pakistan, which is not a party to the Nuclear Non-Proliferation Treaty, was the main source of the cladestine technology from the late 1990s.

2.3.3 Nuclear facilities

In 1973, the Atomic Energy Establishment (AEE) of Lybia was formed. Its main purpose was to build Libya´s nuclear sience infrastructure and technology. In January 1981 it was placed under the authority of Libyan Secretariat of an Atomic Energy (SAE), which continues to maintain supervisory control over the nuclear program till nowadays. The SAE established the Tajoura Nuclear Research Center (TNRC) in 1983 "to solve problems of economic significant to the country via peaceful application of atomic energy". The facility was declared under IAEA safeguards, however, later became clear that the TNRC was a center of Libya´s nuclear military program. It housed cladestine uranium enrichment, plutonium separation and gas-centrifuge technologies.[47]

As was mentioned, in 2003 Libya halted its uranium enrichment program and fully submitted to IAEA inspections. Following year it revealed additional sites that had contributed to its illicit weapons efforts. According to the Nuclear Threat Initiative

"Al-Hashan was Libya's first L-1 gas centrifuge research, development and limited testing location, operational from 1997 to 2002. Al-Khalla succeeded Al-Hashan as the new

[47] Libya, Nuclear country profile, http://www.nti.org/country-profiles/libya/facilities/ (21.4.15)

location for centrifuge research and development and was used to store UF6. Salah Eddin was the new site, after being moved from Al-Khalla, for the uranium conversion facility supplied by Japan in the 1980s. Janzour was a machine shop for centrifuge manufacture. Sabha was an underground storage facility for yellowcake. Sawani was the first storage location for the UCF and centrifuge equipment. Al-Karamia was the first storage location for UCF modules. El-Ezeizia was the original construction materials storage location."[48]

The TNRC facility, became a center of Libya´s post-2003 peaceful nuclear program.
At present, there is no open source indicating the existence of operational uranium mining, uranium miling, uranium conversion, fuel fabrication or reprocessing facilities in Libya.
In 2007, Libya´s ambassador announced that it would take ten to fifteen years to Libyas capability to construct nuclear power reactors.[49]

2.3.4 Assessing the capability

Although, before the year 2003 Libya was believed to possess sufficient nuclear capability to produce nuclear weapon in very near future:

"After the U.S. and U.K. inspections and the IAEA inspections in late 2003 – early 2004, it turned out that many components were not even unpacked and were stored at hidden warehouses. Scientific and technical difficulties were the major reason for Libya's failure to develop nuclear weapons and nuclear industry as such, even though the country possessed all necessary financial and technical capabilities."[50]

Currently, the only significant nuclear facility, which houses a Soviet-supplied 10 megawatt reasearch reactor, is the complex at Tajura. Despite its commitmennt to halt nuclear program, the insufficient technical and currently financial capability, makes it very unlikable that Libya woul be able to develop a nuclear weapon in near future.

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[48] Ibid.
[49] Nuclear Programmes in the Middle East: In the Shadow of Iran, *ed. Mark Fitzpatrick, London: the International Institute for Strategic Studies, 2008, p. 97.*
[50] Elena Geleskul, The History of the Libyan Nuclear program: The reasons for railure, http://www.pircenter.org/kosdata/page_doc/p1813_2.pdf (22.5.15)

3 ANALYSIS OF THE PROLIFERATIVE MOTIVES

3.1 Iran

In the previous analysis it was concluded that Iran is capable of developing a nuclear weapon and could pose a proliferation threat in the future, however the essential question in this regard is, why would Iran decide to do so? According to Sagan, there could be three main motives to develop a nuclear arsenal. With the help of his models, it is possible to asses Iran´s intention.

3.1.1 The Security Model

With the logic of security model, as was described earlier, Iran would decide to obtain nuclear weapon in the case it would enhance the country´s security and at the same time, it would likely refrain to acquire nuclear weapon if it no longer facing external threat which is challenging its sovereignity and national interest.

3.1.1.1 International Aspects

The geopolitical neighbourhood is worth mentioning as Iran is surrounded by nuclear-armed states, namely Russia, Pakistan, India, Israel and US military forces located in the region.[51]

After the outbreak of the Cold War, Iran became an important part of US strategy, as its position on the southern flank of The Soviet Union was very convenient. Regime of the Shah Mohamad Reza closely cooperate with Washington and together with Saudi Arabia created a pillar for the US policy in the region. However the US relations with Teheran had completely changed after the Islamic revolution in 1979 and particulary after US intervention in Kuwait and Iraq. [52]

Both countries have different conceptions about the region. The US has three major interests. The first one is connected with the US National Security Strategy and could be traced even back to the history of US – Iranian relations – to restrain and change the regime in the country. The second interest is the control of free oil flow through the Persian Gulf. This major shipping route represents an important policy objective for the US and thus

[51] Cirincione, Joseph/ Jon B. Wolfsthal/ Miriam Rajkumar: Deadly Arsenals – Tracking Weapons of Mass Destruction, Washington D.C., 2002. S 256.
[52] Ibid.

nuclear armed Iran would challenge the US predominance in the region. And the third is alliance with Israel which benefits from the US security and economical umbrella.[53]

"Axis of Evil" speech in 2002 could be the last straw for Iran to make the crutial decision about nuclear weapon development:

"Our […] goal is to prevent regimes that sponsor terror from threatening America or our friends and allies with weapons of mass destruction. […] Iran aggressively pursues these weapons and exports terror, while an unelected few repress the Iranian people's hope for freedom. […] States like these, and their terrorist allies, constitute an axis of evil, arming to threaten the peace of the world. By seeking weapons of mass destruction, these regimes pose a grave and growing danger. They could provide these arms to terrorists, giving them the means to match their hatred. They could attack our allies or attempt to blackmail the United States. In any of these cases, the price of indifference would be catastrophic."[54]

The speech indicates that US could possibly use military forces to change the regime in Iran. Based on later US military campaign in Afganistan, Iran could calculate that the use of conventional weapons is insufficient in the conflict with the US, so the nuclear weapon could represent a feasible tool to deter the US threat and to conrfim its hegemon position in the Middle East region.

3.1.2 Regional Aspects

With the disintegration of the Soviet Union, Iran lost its biggest, most powerful and in principle most dangerous neighbour - Russia. At present, Iran has border in the north with Turkmenistan, Azerbaijan and Armenia, in the west with Iraq and Turkey and in the east with Afganistan and Pakistan. The majority of these countries is significantly smaller than Iran and poses no real threat, especially not the one, which would have to been deter with nuclear weapon.

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[53] Hadi Semati: Iran's Priorities, in: Sean McNight/ Neil Patrick/ Francis Toase (Editor): Gulf Security – Opportunities and Challenges fort he new Geration, Whitehall Paper Series, No. 51, Royal United Service Institute for Defence Studies and the Royal Military Academy Sandhurst, London, 2000, p. 39.

[54] US President George W. Bush: The President's State of the Union Adress, The United States Capitol, Washington D.C., January 29, 2002, http://www.whitehouse.gov/news/releases/2002/01/20020129-11.htmlhttp://www.whitehouse.gov/march11/timeline/sixb.html, (06.03.15).

The great complexity of the political relations among the states of the greater Middle East regarding security policy makes it nearly impossible to adress all important aspects. Nevertheless, the only states in the region, which could be competitive to Iran are Pakistan, Turkey and Saudi Arabia.

Although there is some disputes between Turkey and Iran, concerning the activities of Kurdish separatists in Iran, it is very unlikely that Iran would choose for nuclear arsenal to deter Turkey from an attack. Also there are some disagreements on the issue of Balochistan, however Pakistan and Iranian relations are rather positive as Iran received substantial assistance from Pakistan on its nuclear program in the past. Saudi Arabia and Iran compete for a hegemony in the region for a long time, however Saudi Arabia simply lacks the operational ability to effectively threaten the interests in Teheran, so the rivalry is limited rather to the rhetorical level and support of the various groups and parties in neighbouring countries.[55]

Althought the Islamic republic of Iran, during the monarchy of Shah, maintained a relatively positive relationship with Israel, currently the Israeli-Iranian relations are hostile. Iran as a "sponsor of terror" suppors terrorists group, namely Hezballah and use them as a proxies against Israel while Tel Aviv uses his allies on the American political scene to isolate Tehran. The rather cordial and strategiclly advantageous relationship between Iran and Israel degenerated soon after the collapse of the Soviet Union and Iranian transition to Islamists power. According to Steven Simons

"Iran's real-politik hostility toward Israel was reinforced by ideological and obsessive enmity."[56]

During the war with Iraq, Iran still purchased weapon arsenal from Israel, however since the end of the sales in mid-1980s, the relationships rapidly worsened. In 2005, President Ahmadinejad went as far to deny the Holocaust issue and made some radical declarations about erasing Israel "off of the map". In this regard, with reaction on Iranian nuclear

[55] Morton Bremer Moerli/ Sverre Lodgaard: Nuclear Proliferation and International Security, Routledge, New York, 2007, p. 106.
[56] Steven Simon, "Iran and Israel," The Iran Primer: Power, Politics, and U.S. Policy, Ed. Robin B. Wright, (Washington, D.C., United States Institute of Peace, 2010.)

program, Israeli President Netanyadu publicly stated that he expects the United Stated to take all necessary steps to stop Iranian progress in nuclear military field. However, apart from the fear of Iranian nuclear program, Israel has no esential reasons to lead a direct military campaign against Iran. At present, Israel poses a security threat to Iran, but it is more a response to Iran´s offensive aims.[57]

3.1.2.1 Preliminary Conclusion

"The foreign policy of the Islamic Republic of Iran is based upon the rejection of all forms of domination, both the exertion of it and submission to it, the preservation of the independence of the country in all respects and its territorial integrity, the defence of the rights of all Muslims, nonalignment with respect to the hegemonist superpowers, and the maintenance of mutually peaceful relations with all non-belligerent States."[58]

To sum up the security factors which could influence the Iranian decision process, it can be concluded, supported with the following statement, that main security challenge can pose the US influence in the region.

"More than any other nation, Iran has always perceived itself as the natural hegemon of its neighbourhood. […] Yet Iran's nationalistic hubris is married to a sense of insecurity derived from persistent invasion by hostile forces."[59]

Both, the US and Israel could be preceived as possible threat because of their opposition to Iran´s nuclear ambitions and their capability to act militarily. From the historical perspective Iran took its lesson to conclude that only nuclear weapon arsenal could provide credible deterrent to discourage the US or Israel from attacking. On the other hand, it is very unlikely that the US would strike Iran in the near future as US armed forces are nowadays busy in other conflicts in the close region. Also the contribution of the intervention against Iran is quite questionable. Experience in Iraq and Afghanistan shows

[57] Ibid.
[58] Article 152 of the translated constitution of the Islamic Republic of Iran, at the International Constitutional Law Project at the University of Bern, http://www.servat.unibe.ch/law/icl/ir00000_.html, (09.04.15).

how difficult it is to achieve satisfactory post-war settlement. Therefore the intervention could result in destabilization of already unstable region.

Finaly, it cannot be ruled out that Islamic Republic of Iran perceives severe security challenges that could lead to decision of pro-nuclear weapon development, although this decision itself increases or poses the most significat threat for Iran´s territorial integrity. Another nuclear-armed state in the region will increase security tension and can lead to further proliferation by states like Egypt or Saudi Arabia. Efforts to maintain a balance in the region could lead to an arms race.[60]

3.1.3 The Domestic Politics Model

Scott Sagan argues that nuclear weapons decisions always serve the interests of some domestic actors, scientific, business, political or from the military, who ecourages or discourage governments from seeking the nuclear arsenal. Therefore the fundamental question is if there are some actors in Iran in favour of nuclear procurement.

As the nuclear decision-making process in Iran is considered to be extremely vital matter, it is discussed only within a close circle of regime leadership, the Supreme Leader, the president, the chief nuclear negotiator and the head of the Supreme National Security Council (SNSC), in addition to a subset of individuals who sit on the SNSC.[61] The most powerful position holds the president, who has executive power.

The previous president Mahmoud Ahmadinejad was famous for using the aggresive rhetoric towards the West and Istrael. During his presidency Iran strengthened diplomatic relations with Muslim countries in the Greater Middle East and Sub-Sahara Africa and further seek allies among states opposing the United States, for example Venezuela or Cuba. Ahmadinejad´s presidency conducted the of "policy of confrontation". He used offensive speech to unify Iran´s population and to gain public support, especially with the regards to the nuclear question, he presents the nuclear program as a matter of national

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[59] Ray Takeyh: Hidden Iran – Paradox and power in the Islamic Republic, A Council on Foreign Relations Book, Times Books, New York, 2006, p.63.
[60] Scott D. Sagen: The Perils of Proliferation: Organization Theory, Deterrence Theory and the Spread of Nuclear Weapons, in: International Security 18, no. 4, Spring 1994, pp. 66 – 107.
[61] Quote by the former IAEA negotiator and current Iranian President Hassan Rouhani in Mehran Kamrava, "Iranian National Security Debates: Factionalism and lost Opportunities," Middle East Policy 14 (Summer 2007), p. 96.

sovereignity, pride and dignity, while stressing the urgency of external security threats posed by the US and Israel.[62]

President Ahmadinejad has been very clever at using external international pressure against his policy on nuclear questions. He has used that to fly the Iranian flag and stir up nationalist feelings within Iran.[63]

This issue of nationalism and identity persists in current presidency of Hassan Rouhani. Moreover, the Islamic Republic seek to any opportunity to distract the Iranian population from the growing list of economic, political and social problems it faces. The nuclear program serves as a bolster to the regime´s support and legitimacy as it redirects attention away from the tangible issues to the question of identity, principles and virtue. Hence the public opinion about country´s nuclear program is supportive in general. This projected especially in the presidental elections in 2009 as the opposition denounced former President Mahmoud Ahmadinejad criticizing his fail in policy issues, while still proclaiming the support for nuclear program.[64]

As was corroborated by the RAND Corporation survey, Iran´s nuclear program had overwhelming public support even during the 2009 as 98% of the population find the nuclear energy for peaceful purposes beneficial. And 39% of the population even approved the development of nuclear weapons, which was more than in January 2008 when 58% of the public was against such treatment. Currently, surprisingly, half of the Iranians do not perceive any negative impact of economic sanctions. This analysis indicates that the nuclear program became part of the national identity and is widely supported also by Iranian political leaders.[65]

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[62] 3 Mehran Kamrava: Iranian National Security Debates – Factionalism and lost Opportunities, in: Middle East Policy, Vol XIV, No. , Summer 2007, pp. 95 – 97.
[63] 0 Dr. Kim Howells MP, Minister of State, Foreign and Commonwealth Office, cited in: House of Commons Foreign Affairs Committee, Fifth Report of Session 2007 – 08: Global Security – Iran, The House of Commons, 20 February 2008, p. 36, www.prliament.uk/parliamentry_committees/foreign_affairs_commettee.cfm, (30.07.08).
[64] Thomas Erdbrink, "Another Key Politician to Run Against Ahmadinejad," Washington Post, March 11, 2009, p. A8.
[65] IISS Strategic Comments: Iran and its neighbours, 11:6, 01 August 2005, pp. 1 – 2, http://dx.doi.org/10.1080/1356788051163, (08.04.15).

During the current presidency of Hassan Rouhani, however, a shift in Iran's foreign and security policy has occurred. The current president of the Islamic Republic was elected in 2013. Rouhani, in opposit to his precedessor Ahmadinejad, change the foreign policy in favour of building better diplomatic relations with the world and "shift away from the bombastic style". Nevertheless, Rouhani adds that Iran´s main objectives including maintaining a nuclear program for peaceful purposes stays unalterable and Iran will nor compromise on its right to uranium enrichment. Rouhani also pursue to maintain production of nuclear fuel for power generation, as well as producing radioisotopes to treat cancer patients:

"*The foreign policy of the Islamic Republic of Iran is based on easing tensions and building confidence with the world. This is not a tactic or slogan. Iran is not seeking tensions with others ... but we don't compromise on our dignity, independence, national interests and value.*"[66]

Rouhani also adding that:
"*We are not after weapons of mass destruction. That's our red line*." And if "*Iran be after weapons of mass destruction, it would rather develop chemical or biological weapons which are easier to make*"[67]

3.1.3.1 Preliminary Conclusion

Iran´s nuclear program serves an important instrument of domestic policy. The Iranian regime uses it as an evidence that Iran is one of the most developed countries of the world. The nuclear program is therefore a usefu tool for propaganda. While the strong political consencus remains among Iranian leaders that the country has a right to develop a civilian nuclear energy program for peaceful purposes, discord appears to exist on its potential military dimension.

[66] Shahram Chubin: Iran's Nuclear Ambitions, Carnegie Endowment for International Peace, Washington D.C., 2006, p. 16.
[67] Ibid.

The Iranian regime has undergone though period over past few years as it had to deal with domestic rivals and facing increasing international isolation and economic sanctions. The election of President Hassan Rouhani brought some hopes for improvement. In oppose to his predecessor, president Rouhani emhasises his desire to reach a long-term, mutually agreeable, nuclear accord with the P5+1 powers. His statements about Iranian ambitions of peaceful nuclear program and aspiration to cooperate with the west authorities indicates that according to Sagan´s Domestics Politics Model, Iran has no motivation to build a nuclear weapon. At least for Rouhani presidency.[68]

3.1.4 The Norms Model

Richard Betts in the late 1970s mentioned Iran as a typical example of a state that might seek to develop nuclear weapons for purely symbolic reasons. Being located among countries aspiring to the status of a regional power in the Gulf, the entrance into the exclusive nuclear club would ensure regional predominance and prestige.

"Iran's strategic environment does not create the insecurity driving Iran's nuclear program, which is driven more by frustration over status and the ambition to be taken more seriously and to play a larger, more global role."[69]

Regional ambitions of Islamic Republic could be also driven by desire to represent Muslim states and to ensure the role of the Shiite in the Muslim world. However, it needs to be mentioned that religious fatwa claiming that:

"...that the production, stockpiling, and use of nuclear weapons are forbidden under Islam and that the Islamic Republic of Iran shall never acquire these weapons."[70]

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[68] Irena kalhousová, Iránský jaderný program: nástroj domácí a zahraniční politiky, http://www.vojenskerozhledy.cz/kategorie/iransky-jaderny-program-nastroj-domaci-a-zahranicni-politiky?highlight=WyJqYWRlcm5cdTAwZTkiLCJ6YnJhblx1MDExYiIsImphZGVyblx1MDBlOSB6YnJhblx1MDExYiJd (23.03.15).

[69] Shahram Chubin: Iran's Nuclear Ambitions, Carnegie Endowment for International Peace, Washington D.C., 2006, p. 16.

[70] Iran's Statement at IAEA Emergency Meeting, August 10, 2005, Source: Mehr News Agency, http://www.fas.org/nuke/guide/iran/nuke/mehr080905.html, (14.04.15).

That means that Iran should not develop military nuclear capability as it is issued in the law by the "highest political and religious authority of the state, the Ayatollah". The impact of this degree is questionable as the document failed to be published in 2005. In this regard also Iranian legislator Mohammad Taqi Rahbar added that:

"...the development and possession of nuclear weapons would not conflict with the religious law, the Sharia."[71]

3.1.4.1 Preliminary Conclusion

It is difficult to assesss Iran´s intentions by examining the norm setting of it decision makers and public opinion although it is clear that Iranian population has positive perception towards the civil nuclear program as it serves the model of progress and modernity.

The possible reasons for developing the nuclear weapon could be Iran´s emphasise of its dominant position and perception of potentioal gained power in the region considering that the nuclear symbol would increase its regional influane, importance and acceptance. Another aspect could be recent crisis of the non-proliferation regime and nuclear policy of the five nucelear-weapon powers as other states have entered this club. This expansion might indicate that the possession of such arsenal remains an important symbol for power and prestige.

Therefore, it cannot be ruled out that the Islamic Republic of Iran could decide for a military nuclear capability for prestigious motives.

3.2 Syria

3.2.1 The Security Model

3.2.1.1 International Aspects

On a broarder strategic regional level, Syria could be also concernerned over the current security situation in the Middle East. The US troops are nowadays at Syria´s doorstep, in Iraq and Turkey and Damascus could find itself in vulnerable position as US aggressive

[71] Federation of American Scientists: Iran's Missing Anti-Nuclear Fatwa, www.fas.org/sgp/news/secrecy/2005/08/081105.html#1, (30.04.15)

National Security Strategy could be applied to Assad regime as well. In 2003, few days before invasion of the US army of Iraq, President Assad expressed his concerns over the increasing presence of the US in the region:

"We are all targeted [...]. We are all in danger."[72]

Agitation with the US over Lebanon has increased Damascus´s threat perceptios as well. Since the assassination of former Lebanese Prime Minister Rafik Al Hariri in 2005, Syriawas under pressure to cooperate with the UN investigation and to set up a tribunal to try the suspected killers. Moreover, West authorities has long denounced the support that Syria provides to terrorist groups Hezbollah and Hamas.

3.2.1.2 Regional Aspects

Syria has five neighbours, Turkey, Lebanon, Jordan, Iraq and Israel.

The relations between Syria and Turkey have long been strained. The annexation of the Hatay Province to Turkey in 1939 and Syria´s support for Kurdistan Worker´s Party (PKK) iniciated the friction between the two countries and although the relations greatly improved after Syrian commitment to stop harbouring the PKK militants, current Syrian civil war brought the relations again to the strained status.

The reciprocal relations between Lebanon and Syria were remarked by the Syrian perception of Lebanon as part of its historic territory. The countries have not been able to establish normal diplomatic ties also because of the fact that Syria was accused of involvement in the assassination of the former Lebanese prime minister Rafiq al-Hariri in 2005. The first attemts to put ties on a more equal basis dates back to the 2008. Currently, the Syrian civil war increased tension between the two neighbours because of the influx of Syrian refugees to Lebanon.

Syria and Jordan relations have gradualy improved since the first Gulf War as Jordan became “an important transit point” for Syrian businessmen in the Palestinian territories.

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[72] William Schneider Jr.: Missile Defence as an Instrument of Non-Proliferation Policy, in: Robin Ranger, David Wiencek, Jeremy Stocker (ed.): International Missile Defence? Opportunities, Challenges and Implications for Europe, The Royal United Institute for Defence Studies, Whitehall Paper 55, Stephen Austin &Sons Ltd., London, 2002, pp 72.

However the outburst of the civil war in Syria did not contributed to the strenghtening of the diplomatic ties and the relations became somewhat strained.

The political relations between Syria and Iraq have often been rather hostile. The closer cooperation between Iraq and Syria was establish after the year 2006. The countries formally ended "more than twenty years of diplomatic estrangement" and accorded number of economic agreement. Since the Syrian Civil War, Iraq has mainained its embassy in Syria as a reward for Syrian political support in Iraq-US war.

Finaly, diplomatic ties have never been established between Syria and Israel. The most persistent disputies between Syria and Israel is narrow strip of land east of Israel and west of Syria. Golan Heights is center of conflict between the two Middle Eastern countries since the late 1940s. Several mutual talks and peace agreements were held but none of them was succesful. Moreover, the strained relationship took another step further after "Six Day War". The hostile relations continued till nowadays and the fact that Israel possess nuclear arsenal and is not a signatory state of Nonproliferation Threaty could be perceived by Syria as the main threat.

3.2.1.3 Preliminary Conclusion

To be concluded, although Syria has strained relations with most of its neighbours, Israeli and US are perceived to be the main threat. Therefore, the strategic decision to develop nuclear weapon program could reflects how Syria perceives the US policy and Israel nuclear capability. Syria´s primary security concern is the military balance with Israel.

"The Syrian motivation to develop a nuclear weapons program is anchored in basic perceptions held by the regime and reflects its conviction that the acquisition of nuclear arms is a strategic necessity for the country in order to deter its enemies – first and foremost Israel but also the United States and other neighbors."[73]

[73]Eyal Zisser, Samuel Bar and Oded Brosh, Culture of Command and Control of Nuclear Weapons in the Middle East – Syria, http://www.herzliyaconference.org/eng/_Uploads/dbsAttachedFiles/Bar_CultureSyria.pdf (11.04.15).

In this regard, the increased concerns about Syrian proliferative intentions have been expressed over Iranian involvement in Syrian nuclear activities. According to London-based Jane's Defense Weekly, Iran and Syria

"signed a strategic accord meant to protect either country from international pressure regarding their weapons programs."[74]

Finally, this strategic alliance with Iran, support for Hezbollah and ongoing civil war deteriorated the relationships between Syria and Arab states in the region and weakened ties between Syria and other Sunni Arab regimes. The decision to nuclear weapon procurement could be seen as a meaningful solution for the security assurance.

3.2.2 The Domestic Politics Model

Syrian Presiden Bashar al-Assad is currently the highes governing authotity in Syria and is responsible for all key decisions regarding Syria´s nuclear program. The top nuclear agency in Syria is the Atomic Energy Commission of Syria (AECS) and is regulated by the Prime Minister´s office. The most controversial entity linked to Syria´s nuclear development is the Syrian Scientific Studies and Research Center as it is suspected to serves a military research. However there is not enough evidence in the open source literature to confirm the speculations.

Syrian government decision making process with respect to the nuclear weapons is opaue for several reasons. It could be the conflict with Israel, so the sensitive nature of these activities demand the strictest military secrecy and further there are no political pressure groups in Syria that either oppose or support the acquisition of the nuclear weapon.

“Syria's strategic behavior has been traditionally rather cautious and restrained, and it stands to reason that the leadership will do all it can to prevent escalation to such a level.

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[74] "Report: Syria agrees to hide Iran weapons," World Tribune, December 20, 2005, www.worldtribune.com; Robin Hughes, "Iran, Syria sign a further defense co-operation agreement," Jane's, June 27, 2007, www.janes.com. (23.05.15)

On the other hand, an analysis of Bashar al-Asad's behavior, and certainly an examination of his rhetoric, raises the possibility that Bashar would use nuclear arms if he found himself in a "doomsday" situation."[75]

As the unstable and violent situation in the country can attract US invasion with the same intention as it was previously in Iraq. The possession of nuclear weapon could mean for Syria the survival of Assad regime as it can deter the US invasion.

3.2.2.1 Preliminary Conclusion

The current situation in the country could be one of the motivation to develop a nuclear weapon. According to the historical experience, Syria could perceive Iraq´s fate as a lecture demostrating that even the strong and developed Iraq´s conventional army had been defeated by a delicate US technology and with this perception could rather follow North Korean exemplar as the country was able to escape from US intervention potentionaly with the fact that it possess nuclear arsenal.

3.2.3 The Norms Model

"Syria has long aimed at playing a leading role within the Arab world. Its prestige and influence within the Arab community have always been important factors in Syrian policy-making."[76]

The political thinking under President Assad aspires to playing a leading role in the Arab world. Acording to Syrian Ba´athist ideologist, Syria always pursued to protect the strategic balance in the Middle East.

With the question of prestige, it is necessary to mention Syria-Iran´s relations as alliance with Iran has affected Syria´s position within the Arab world as well. Although the alliance is asymetric, as it has been of major strategic importance for Iran and only of

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[75] Eyal Zisser, Samuel Bar and Oded Brosh, Culture of Command and Control of Nuclear Weapons in the Middle East – Syria, http://www.herzliyaconference.org/eng/_Uploads/dbsAttachedFiles/Bar_CultureSyria.pdf (11.04.15).
[76] Ibid.

tactical interest for Syria, the cooperation between these states evokes an international debate full of concerns. Under Iran´s security umbrella Syria plays more important role in the region.

"Syria could join Iran in the strategic design to undermine, and overthrow, the regional status-quo, by intimidating moderate regimes allied with the US and inimical to the expansion of Iranian influences under the protection of Iran's nuclear posture."[77]

3.2.3.1 Preliminary Conclusion

The norms that drived Syria´s motivation to develop nuclear weapon appeard to subside. To play strategic role in the region was always the aim of Syrian leaders. However, being aware of technical incapability, seeking the external parity could be the only way to maintain its position in the region and maybe only at that time with its support to develop nuclear arsenal.

3.3 Libya

The foreign relations of Libya underwent much fluctation and changes over the past years. They were marked by severe tension with the West and with some national policies in the Middle East and Africa. Since the year 2003, the Libyan government pursues to restore normal diplomatic ties. Libya voluntarily renounced the development of weapons of mass destruction and committed to forswear terrorism. International sanctions against Libya were lifted and after many years of isolation, Libya was able to open to the world.

Nevertheless, the current situation in the country is marked by civil unrest and fight for supremacy of the country. There are two governments and two parliaments and considerable part of the country is in the hands of antonomous groups. It is very unlikely that in current situation, Libya would pursue to develop nuclear weapon, considering the financial and technical demandingness of such decision. However, it is advisable to asset motivation of Libya to seek for such arsenal in the past and what has caused the nuclear rollback and maybe predict potential motivation or threats for the future. As there are very

little open sources, which capture the situation in Libya after the revolution, any predictions should be interpreted very carefully.

3.3.1 The Security Model

Libya´s location next to the very unstable part of the world, the Middle East region, indicates that Tripoli could see the posesion of a nuclear weapon as an assurance of security. Moreover, with regard to the Libya´s small population, a nuclear detterent could appeared as a feasible tool, requiring little manpower and still capability of faciliating protection from external threats.

3.3.1.1 International Aspects

As stated by Libyan senior official, the first motives for pursuing the nuclear weapon were emhasised on regional prestige and leadership in the region, however, later:

"National defendence became a top priority of the regime due to regional instabilities, primarily the Arab-Israeli conflict, and recent memories of brutal colonization."[78]

Libyan efforts to seek for nuclear weapon capability were motivated with the "political implicatin of the technological gap" between Israel and Arab countries. Libya, as an Arab country, have never concealed its perception of Israel as a "colonialist-imperialist phenomenon". One source of the tension between Libya and Israel was Gaddafi´s refusal to recognize Israel and repeated calls for its destruction. The other was Israelan nuclear arsenal. Muammar Gaddafi repeatedly condemned Israel and its nuclear monopoly in the region.

In the mid-1980s, the perception of external security threats became even more prominent motive as the United States launched a bombing strike on Tripoli and Benghazi following suspicion that Quadhafi was involved in bombing in Berlin. The countries engaged each other in several military conflicts, which only demonstrated how powerless

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[77] Eyal Zisser, Samuel Bar and Oded Brosh, Culture of Command and Control of Nuclear Weapons in the Middle East – Syria, http://www.herzliyaconference.org/eng/_Uploads/dbsAttachedFiles/Bar_CultureSyria.pdf (11.04.15).

[78] Mohamed M. Ennami, Scientific Advisor to the Secretary of the General People's Committee for Manpower, Training and Employment, "The Libyan Case," The 18th United Nations Conference on Disarmament Issues in Yokohama, Japan, 21-23 August 2003 (unpaginated).

were Libyan forces and defences in front of the US manoeuvres.[79] Quadhafi was not able to establish a constructive dialogue with Washington and accused the US of being a "symbol of Western imperialism". Thus, the specifics of relations in the region of the Middle East and attitude of Arab states towards Israel and Western countries influenced Libyan leader´s decision about nuclear military program.

"If we had possessed a deterrent –missiles that could reach New York – we would have hit it at the same moment. Consequently, we should build this force so that they and others will no longer think about an attack...the world has a nuclear bomb, we should have a nuclear bomb"[80]

In the early 1990s, nevertheless, doubts regarding the costs and potential benefits of the possession of nuclear weapon have emerged as growing popular dissatisfaction with the domestic economic situation appeared to take place. Longstanding debates about potential strategic utility of nuclear procurement have been concluded to be not particularly "useful" for Libya´s needs as nuclear weapons seemed to be not "enough for countries without complete conventional military potential". This statement signalled the Libyan preparedness to consider abandoning nuclear weapon development occured already at 1990s, but at that point, these approaches were rejected by George Bush´s administration. In this regard, as stated:

"After the imposition of UN sanctions and mounting international pressure, Libyan officials seem to have concluded that discounting the nuclear weapon project would be de facto capitulation to the West"[81]

Moreover, in 1992, Libya was accused of being involved in Lockerbie bombing of 1988. With regard to the nuclear issue, it has several significant consequences: Increasing isolation

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[79] Leonard S. Spector, *Nuclear Ambitions: The Spread of Nuclear Weapons, 1989-199*0 (Boulder: Westview Press, 1990), 183.
[80] Nuclear Regulatory Commission, U.S. Department of Energy, Code of Federal Regulations Title 10 Energy: Revised As of January 1, 2002, p.45

and perception of threats again intensified Libya´s commitment to acquire nuclear weapon and the motivation for such mean of destruction changed from rather prestige to "security-oriented" focus.

"The regime became afraid that Libya would become the main target of the Middle East region for the United States"[82]

However, during the early 1990s Libya´s regime faced considerable economic consequences of the sanctions, which gave the cause for concerns about domestic stability. The considerable loss of support for the regime and conflict with the Islamists in the east forced Lybia to rearrange its objectives and to focus more on improvement of the relations with the West.

3.3.1.1 Regional Aspects

Libya has six border countries Algeria, Chad, Egypt, Niger, Sudan and Tunisia. Considering the threats, Algeria does not posses nuclear, chemical or biological weapon and is not suspected of pursuing such capabilities and the same status can be applied as well on the case of Chad, Niger, Sudan and Tunisia. The only Libya´s neighboring country which possess weapons of mass destruction is Egypt.

The relations between Egypt and Libya have underwent several tense situation. Although after gaining independence, the countries were initially cooperative, the Egypt´s pro-Western policy and Libyan-Egyptian War of 1977 caused that the relations were suspended for nearly twelve years. The countries shared different views on conception of the region, however, since 1989 the relations have steadily improved. Overall, it is very unlikely that Libya would decide for nuclear arsenal to detter potential Egypt intervention.

3.3.1.2 Preliminary Conclusion

After proclamation of indepentence in 1951, Libya did not have to face any territorial threats of its neighbors or had no other substantial differences that could motivate the

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[81] Interview with senior official in the LGPC, Tripoli, 16 June 2005, http://calhoun.nps.edu/bitstream/handle/10945/11118/braut-hegghammerApr09.pdf?sequence=1, (12.05.15).

country to develop nuclear weapons for the security reasons. On the other hand, Libya´s location in North Africa and direct proximity with the Middle East region, which has never been stable, leads to the fact that security issue is one of the most acute for all countries in the region.

It is undeniable that one of the motivations for Libya to decide for nuclear procurement in the past was US prensence in the region and hateful attitude towards nuclear monopoly of Israel. On the other hand, the aggressive statements towards US and Israel, support for terrorism and involvement in Lockerbie bombing, led to the binding economic sanctions and withdrawals of many agreements on nuclear peaceful cooperation. Aggravating situation caused that Libya was unsuccesful to make greater steps in its nuclear program.

3.3.2 The Domestic Politics Model

Muammar Quadhafi, who had controlled Libya´s government since 1969 till 2011, founded the nuclear program and entitled himself as an ultimate authority over all important decisions. The official head of the Libya´s nuclear program was Secretary of the General People´s Comittee and Secretary of the National Board of Scentific Research (NBSR). Libya´s intelligence agency currently plays rather only a minimal role in the nuclear program, however prior to the year 2003 it helped acquire foreign information on nuclear technology and development to Libyan nuclear weapon procurement.

Qadhafi´s principal foreign policy goals were unification of Arab world, elimination of Israel and Western influence in the Middle East and Africa and advancement of Islam. The development of the atomic bomb and regional nuclear leadership was Qadhafi´s personal ambition, however it seemed, that other governmental authorities did not share his perception of this important strategic issue:

"Libyan regime´s inconsistent commitment to pursuing nuclear weapons reflects that while Libya could afford to pursue nuclear weapon, it did not particularly need them. The motives driving Libya´s pursuit of nuclear weapons were deneral objectives of regional

[82] Interview with formerly central RC figure, Tripoli, 15 June 2005., http://calhoun.nps.edu/bitstream/handle/10945/11118/braut-hegghammerApr09.pdf?sequence=1, (23.04.15)

influence and national security, but it appears that it was less clear to the regime precisely how acquiring nuclear weapons would make Libya more secure and powerful"[83]

The country had serious chance to develop a mighty nuclear industry, however it failed for several reasons. Regardless of restrictive US sanctions, complicated power system in Libya and unclear division of powers among the major authorities led, except other reasons, to Libya´s refusal to continue the WMD program. According to nonproliferation expert Harald Mueller:

"The key reason for failure was not the lack of financial or scientific components, but the ineptitude of the Libyan authorities."[84]

Currently, four years after Muammar al-Quadafi´s death, Libya was not able to achieve stable political environment. Libya is split into two opposing governments, parliaments and fighting forces, intent on seizing the country´s power and asset. In the connection with proliferation threat, there is one fact, which is worth mentioning. Due to persistent unrest in Libya, West nonproliferation specialist fear that the retired WMD scientist could flee the country and seek to sell their expertise abroad or to stay in the country and cooperate with the extremist domestic groups. The US authorities, therefore, funded effort to provide civilian jobs to approximately 700 Libyan scientists, including some 200 atomic scientist:

The jobs effort, which has received roughly $2 million annually from Washington, was devised to help steer former WMD scientists away from selling their specialized knowledge to rogue states or extremists[85].

However, there is still a small potentional risk that proponents of Quadafi´s principals among scientits will seek to fullfill his ambitious and with the cooperation of another party will try to develop nuclear weapon.

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[83] Ibid.
[84] Harald Müller, A European NonProliferation Policy…, p. 269.
[85] Libyan WMD Experts Could Leave Country Amid Fighting, http://www.nti.org/gsn/article/libyan-wmd-experts-could-leave-country-amid-fighting/ , (23.04.15)

3.3.2.1 Preliminary Conclusion

"Libya's WMD program is considered as a result of Muammar Qaddafi's ambitions and policy, and the Qaddafi regime has fallen."[86]

To be concluded, historically, pursuing of nuclear weapon arsenal was not driven primarily by Lybian domestic politics. More or less, the only authority, who had seen the positivness in the potential of nuclear weapons was Quadhafi and his ambitious were rather connected with desire for regional prestige and hegemon. Years after his death it could be predicted that Lybia will not pursue to abuse nuclear weapon capabilities in the near prospective as the future government would have to deal primarily with the economic and social issues, caused by unstable domestic situation. Only potentional threat could be seen in the current unemployed Libyan scientists, who could rather ensure their livelihood by selling the specialized knowledge to the third parties or join pro-Quadhafi´s regime movement and with some external support could pursue to fullfil their former leader´s aspirations, however this second scenario is very improbable.

3.3.3 The Norms Model

As was mentioned earlier, the possession of nuclear weapon could be to a large extent status factor, which would allow, in this case, Tripoli to take a lead position in the Arab wolrd or in other African countries. The position of the first Arab possessor of such mean of destruction could strenghten the authority in the region.

Libyan officials have admited the fact, that strategic incentives was the very early motive driving Libya´s efforts to seek nuclear arsenal. The concerns about prestige and political ambitious were more important than military concerns.

"In 1969 and early 1970s we did not reflect on where or against whom we could use the nuclear bomb. Such issues were not considered. All that important was to build a bomb"[87]

At the early stage of Libya´s nuclear ambitious, the nuclear weapon could provide a leading reagional role not only in the confrontation with Israel, but could also serve as a

[86] Libya: Al-Qadhafi addresses General People´s Congress Tripoli, Great Jamahiriyah TV, 2 March 2004
[87] Ibid.

mean to balance Egypt´s leadership credentials. Therefore, the conceptualisation of atomic bomb as a symbol of technological progress and power was an important aspect of Libyan regime´s decision making process. On the other hand, Quadhafi´s reported attempts to purchase nuclear weapon from other states indicates that simply obtaining a nuclear bomb was considered as more essential than the prestige of developing an indigenous nuclear weapon capability on its own.

By the mid-1980s, nonetheless, Libyan regime concluded that its aspiration for regional supremacy was not supported by other states in the region. Thus, possession of nuclear destructive mean was no longer seemed to offer a opportunity for assumption a leading role in the confrontation with Israel. As a Lybian official stated:

"At this point the role of Israel as a motive for Libya´s objective of acquiring nuclear wepons siminished."[88]

3.3.3.1 Preliminary Conclusion

"The nuclear project was one of several Libyan technological acquisition efforts that seem to have been driven rather by a desire to be perceived as a country possessing cutting-edge technology rather than pragmatic assessments of specific security problems and miliary needs."[89]

The statement above indicates that Libyas motivation driver was primarily ambition to become a regional nuclear hegemon, however, Libyan officials have argued that the regime pursued the nuclear capabilities for a complex set of reasons, specificaly "for different reasons at different times". As it was demonstrated earlier, the main motives that were driving Libya´s nuclear weapon development can be devided into three phases. Initially, the efforts to build a nuclear weapon arsenal were driven by a desire for prestige and regional prominence. Subsequently the Libya´s motives were increasingly changing by concerns

[88] Interview with formerly central figure in the RC, Tripoli, 15 June 2005. http://calhoun.nps.edu/bitstream/handle/10945/11118/braut-hegghammerApr09.pdf?sequence=1, (23.04.15).

[89] Lisa Anderson, "Libya and American Foreign Policy," *Middle East Journal* 36, No. 4 (1982): 526.

about national security and these were further reinvigorated from the mid 1990s as the tensions with the international community deepened:

"There was a renewed purchasing campaign in the nuclear program driven less by status than by a desire to ensure Libya´s survival"[90]

Lybian representatives, nonetheless, soon discovered that precarious relations with the West and US sanctions lead to more isolation and consequent economic crisis and domestic dissatisfaction.

Finally, there are several sets of reasons why the Libyan regime decided to give up its nuclear weapon ambitions. First were factors that over time led to the questions of nuclear arsenal importance for Libya and doubts within the regime of such project. Second were US sanctions and connected increasing economic tension in the country. And the third was US-Iraq military confrontation and development of the security issues in the world after the terrorrist attack in September 2001. These set of causes greatly contributed to the Lybian nuclear rollback and decision to halt nuclear weapon development. Thus by 2003, senior Libyan regime representatives considered the nuclear aspiration and counterproductive for national security and well-being and the role Libya focused to play internationally.
However there was one perception, which persists, the view of Israelan nuclear weapon monopoly in the Middle East as Gaddafi appealed for disarment of Israel several times.

"If the Israelis have the nuclear weapons and the nuclear capabilities, then it is the right of the Egyptians, the Syrians, the Saudis to have the same – even the Palestinians should have the same because their counterparts, or their opponents, have nuclear capabilities," and "If we don't want this situation, so we'll have to disarm the Israelis from their nuclear weapons and capabilities."[91]

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[90] Corera, Op. Cit., 178; Ronald Bruce St. John, "Libya Is Not Iraq: Preemptive Strikes, WMD and Diplomacy," The Middle East Journal 58, No. 3 (Summer 2004): 388-389; Bowen, Op. Cit., 59; Gary Hart, "My Secret Talks with Libya, and Why They Went Nowhere," Washington Post, January 18, 2004.
[91] Gaddafi: Palestinians should have nukes, http://www.ynetnews.com/articles/0,7340,L-3795368,00.html (20.04.15).

COMMENTS AND DISCUSION

This work provided a brief theoretical introduction of nuclear proliferation and introduced Sagan´s three modes which might help to explain nuclear weapon procurement. Following a historical and technical evaluation of the selected countries´nuclear programs and nuclear capabilities, all three models have been used to assess their intentions. Aim of this part is to answer the questions raised in the theoretical part and offer possible solutions.

3.4 How helpful are Sagan´s model in assessing the cases?

In order to assess a potentional threat, it is necessary to analyse the capabilities of the analysed country to inflict harm and then the intention to really do so. In the article "Why do States build Buclear Weapons", Scott Sagan´s focuses on the evaluation of the intention by three different sets of motivations. First motivation reflects pure security concerns, second evaluate interest groups and authorities which support the nuclear development and third assess prestigious motives for nuclear weapon procrement.

3.4.1 The Security Model

"With the 'security model' Sagan offers an explanation for nuclear weapons proliferation in accordance with the tradition of Realism and Structural Realism as theories of International Relations."[92]

Applying the model to the cases of Iran, Syria and Libya, the security concerns provided reasonable arguments for nuclear weapon decision. However several conclusions are possible. In the case of Iran and Syria, the countries had an incentive to acquire nuclear weapon prior to the regime changes in Afganistan and Iraq, so their decision to nuclear procurement was not iniciated with the immediate security threat connected with the US invasion. It is more likely that Syria and Iran desire to develop nuclear weapon rather intensified after the intervention in Afganistan and Pakistan with intention to deter the possible attack.

For the case of Libya, it is clear that the country also pursue to develop nuclear weapon prior to the conflicts in Afganistan, however, in opose to the Sagan´s assumption, it halted

[92] Oliver Schmidt, Analyzing Iran´s Nuclear Intentions, Department of Politics and International Relations, Lancaster University, September 2008.

its nuclear military development as Libya was, except other reasons, afraid of Iraq´s fate and immediate pre-emtive strike by the US.

Therefore, the "security model" provides a legitimate arguments for pro nuclear weapon decisions, however, applying alone, it cannot provide sufficient explanation of the country´s intentions. To be concluded, security is a strong motivation for the acquisition of nuclear weapons and cannot be ignored or ruled out, howere it is insufficient to cover all the possible intentions.

3.4.2 The Domestic Politics Model

"The 'domestic politics model' focuses on actors or interest groups on the domestic level with a strong incentive to lobby in favour of or against nuclear weapons."[93]

Reffering to the analysed cases, it is possible to conclude that leaders of each country had ambitions to develop nuclear weapon.

The former Iranian President Ahmadinejad utilised the international debate to create the perception of an existing external threat to evoke public support and a "rally behind the flag" effect, however there are no evidence that there were some political actors or groups, which would be linked to nuclear weapon statements in public at that time. Current President Rouhani in opose expressed his disagreement with the nuclear procurement in order to utilize diplomatic ties with the West. The former Lybian leader had personal nuclear ambitions connected with prestige and dignity, however the regime was not convinced about benefits of such arsenal. Syrian leader Assad may also have the intention to develop a nuclear weapon as he would like to ensure survival of his regime.

It seems that assessment of political actors on the domestic level can provide reliable information about the nuclear intentions of the country, however it is very rare that any governental official would publicly speak in favour of pro-nuclear weapons decision with respect to the most countries´ obligation from the NPT. Furthermore statements regarding the opinion of authorities from the other executive branches like military, scientific or business groups are very difficult to obtain and therefore they are mostly not included in the assessment.

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[93]Oliver Schmidt, Analyzing Iran´s Nuclear Intentions, Department of Politics and International Relations, Lancaster University, September 2008.

Finally, it can be concluded that the Sagan´s "domestic politics model" cannot provide enough indications for nuclear intentions of the analysed countries, nonetheless, it is still valid factor for explaining decesion-making.

3.4.3 The Norms Model

"The 'norms model' provides a strong analytical category for the analysis of nuclear weapon decision-making, as it focuses on possible reasons for or against the development of nuclear weapons. According to Scott Sagan the term 'norm' refers to normative predispositions, which determine an actor's behaviour."

Historically, following the Islamic Revolution, Iran´s desire was to represent all Muslims and to defent their interest. Possession of nuclear weapon would also mean that Iran could be percieve more seriously in international arena. Iranian population has positive perception towards the civil nuclear program as it serves the model of progress and modernity, however according to RADN survey, it is clear that it will not have the same support for military purposes.

As was stated desire for prestige was the initial driver for nuclear aspiration in Libya. Possessing "cutting-edge technology" and vision of first Arab country with such arsenal should assure the supremacy and prestigious position in the region.

Syrian desire for respect within the Arab world was also factor of Assad regime. It has never possessed sufficient technological or economical capability to develop nuclear weapon without external support, however, the military balance with Israel ...important part of Syrian policy.

The "norm model" raises a feasible mean to assess decision-making of all the analysed cases in this work and it can be used to indicate potential normative dispositions and thus nuclear aspirations. What may cause some difficulty, especially with the case of Iran, is deduction of the linkage between civil nuclear program and possible military nuclear program.

Conclusively, it has become obvious that it is very difficult to assess analysed countries intentions using Sagan´s models. All of the three possible motivation provide credible reasons and arguments that could be applied to the analysed countries and explain their potentional calculus, however, finding evidence to provide reliable prognosis is nearly

impossible. Therefore Scott Sagan´s model definitely provide the maximal explanatory tool for evaluation in retrospect and could be considered as relevant and viable for the assessment of nuclear decision-making. The real problem is to collect relevant informatin that could apply for each model as there is very little publicly open sources about this issue.

3.5 Do Iran, Syria or Libya, according to Sagan´s models, intend to build nuclear weapons?

Sagan´s three models serves ways to analyse country´s intentions, however, as was stated above, it cannot offer a reliable and final answer to the question raised in the theoretical part: Do the selected countries pursue to develop nuclear weapon? This paragraph will provide possible indications for a pro- or contra- nuclear weapon procurement decision in the analysed countries, with respect of their technical capabilities and analysis of their intentions according to the three models.

3.5.1 Iran

"If an anti-nuclear fatwa would exist, and this cannot be ruled out, this would provide the strongest argument against an Iranian nuclear weapon program, as it would be a decision of the highest political and religious authority in the Islamic Republic"[94]

Balancing pros and cons, it is still difficult to determine Iran´s nuclear intentions. On one hand, Iran and its government could benefit from nuclear procurement and the unsteady cooperation with the IAEA, enrichment program and some unresolved suspicious military implementations give additional hints for military nuclear program. On the other hand in case of international suspicions, the imposed sanctions and western intervention might degrade public support for the current Iranian government. Moreover, current President Assad. seems to be interested in establishing better diplomatic ties with the West as may calculated that cooperation would be more benefitial.

Answering the question, it can be concluded that although there is no prove for Iranian nuclear weapon program, the given arguments about its technical capability and evaluation of motivation based on Sagan´s model indicates likely that Iran pursued a nuclear weapon

[94] Oliver Schmidt, Analyzing Iran´s Nuclear Intentions, Department of Politics and International Relations, Lancaster University, September 2008.

arsenal for several security, domestic and prestigious reasons. The vision of the second Muslim possessor of such destructive arsenal and tenth nuclear armed state possibly drives the nuclear ambitions the most.

However, considering the security issue, according to available information, in the near future, Iranian nuclear arsenal would not serve as a credible deterrent against its most dangerous enemy, the US. It indicates the fact that if Iran would develop a nuclear weapon, it is very unlikely that it would have iniciate the nuclear bombing in the military conflict. As such destructive power would be immediately strike back with the US nuclear more powerful revenge. This may be possibly applied on all nuclear proliferative cases as most states developed the nuclear weapon rather as determent of enemy, for prestigous reason or for balancing the power with it rivals in the region than for initiating the nuclear war.

3.5.2 Syria

Syria is currently undergoing a severe internal political and security crisis. Considering the Syria´s infrastructure and technological and economical aspects, Syria does not seem to have the capability for cladestine nuclear activities and it is nearly impossible that Syria would develop such arsenal without an external help. However, the analysis according to Sagan´s models and suspicions aroused by the Al Kibar reactor, insafficient cooperation during the investigation and recent Spiegle´s accustation that another questionalbe facility is currently implementing in Quasayr , indicates that Syria may have found external support and is working on the development.

Having witnessed attacks on Iraq, Afganistan or Serbiawhile nuclear procured countries remain secure, could Syria gravitate toward nuclear deterrence as it could be an only mean to ensure survival of Assad´s regime. On the other hand, it is the embarking on any sort of suspicious activities which would have major impact on Syrian position and can caused the great rationale for the US to seek regime change in Syria.

According to evaluation of pros and cons, it needs to be conclude, that Syria could be a potential candidate for nuclear proliferation, however, due to ongoing civil war in the country, it is plausible that Syria would change the strategy in the near future and could pursue to establish closer ties with the West and rather focus on nuclear energy primarily on civilian research. However:

"The role of Iran's relations with Syria will continue to be a major contributing factor should Syria ever decide to pursue a nuclear weapons capability."[95]

3.5.3 Lybia

Historically, Libya admited that the country was pursuing to develop a nuclear weapon. According to analysis, there were several factors which led the former leader to decide so. However the assessment of Libya´s rationale to seek cladestine nuclear technology also demonstrates that the motives and commitment were ambivalent. Maalfrid Braut-Hegghammer in his article argues that the first doubts about benefits of possessing the nuclear weapon came already in 1986:

"After the 1986 bombing the Libyan regime realized that the consequences of Libya's "revolutionary" foreign policy created real security problems"[96]

In 2003, the final decision to halt nuclear weapon activities was therefore long process influenced by external and internal factors.

Currently, hopes for improvement of the conditions in the six-million North African country that araised at the end of twenty-four years repressive government of Colonel Gaddafi, unfortunately steadily fade away. The security situation in Libya may still be considered unstable, complicated, with a slightly deteriorating trend. Therefore, Lybia could not be considered as candidate for nuclear proliferation as it lacks all the capabilities to develop nuclear arsenal. As was mention, the only threat could be seen in scientist involved in nuclear program, whose knowledge can be very useful for other countries or for extremist group within the country. According to Nuclear Thret Initiative:

"Libyans who were involved in the program who had a great deal of knowledge, and it is knowledge that one has to be concerned about when it comes to starting up nuclear weapons programs... Libya did have those individuals. And believe me, those experts could

[95]Is Syria Candidate for nuclear proliferation?, http://www.nti.org/analysis/articles/syria-candidate-nuclear-proliferation/ (20.05.15).

have been very useful to the Syrians or others who might be going down the nuclear path."[97]

3.6 Are the potential nuclear military programs of the analysed countries threat for "the West"?

Considering "the West" as the countries within the European Union and NATO (including the US), it can be argued that

"Iran's ballistic missiles can reach EU and NATO territory but so far it is not capable to deliver weapons of mass destruction with these delivery systems. Iran does not possess the capability to strike against the US homeland, but US forces are within the reach of Iranian weapon systems."[98]

However, video recently obtained by an Israeli news organization demonstrates that "country is pursuing an aggressive long-range missile program with worldwide implications". Therefore, to answer the question, Iran could not currently pose a threat for the West, however, with respect to the suspected Iran´s steps in missile program and disability to reach a final setlement in negotiations with the P5+1, some US and European authorities believes that the activities in the military programs indicates Iran´s eventual intention to attack what it calls "the little Satan" (Israel) and "the great Satan" (the United States).[99]

As was explained in the previous part, Libya currently does not pose a threat as it faces civilian and governmental instability and halt its nuclear weapons activities earlier. The ongoing civil war in Syria also indicates that it would be improbable that in this situation, Syria will iniciate military conflict (with the hypothesis it will possess nuclear weapon) and

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[96] St. John, Op. Cit., 393; Jon B. Alterman, "U.S.-Libyan Rapprochement: Lessons Learned," Paper written in Rome, 13 December 2004, 7. (21.04.15).
[97] Libyan WMD experts could leave the country amid fighting, http://www.nti.org/gsn/article/libyan-wmd-experts-could-leave-country-amid-fighting/ (20.04.15).
[98] Sascha Lange/ Oliver Schmidt: Military capabilities of the Iranian Armed Forces and the Consequences of a military strike against Iran, in: European Security and Defence (Europäische Sicherheit), 56/ 12, December 2007, pp. 34 – 38, (German text only), , (10.04.15).

would aim to attack. The conflict in Syria, nonetheless, raises some concerns about the security of Syria´s weapons stockpiles as it could became an easy target for the extremist groups. Another thing which needs to be mention is the idea that Robert Joseph, who helped lead U.S. negotiations with Tripoli on shutting down its WMD programs suggested:

"Syria may try an approach that other states in the region—including Syrian ally Iran—have employed or are considering. Th is would be to openly develop the infrastructure for nuclear power generation, including sensitive facilities that can be used to produce nuclear weapon material, under IAEA inspection and in compliance with international nuclear trade rules. Once the facilities began operating, Syria could withdraw from the NPT, seize stocks of weapons material, and produce nuclear arms. This is the approach the international community believes Iran is pursuing and other regional states may be thinking about. It would avoid the risks of a clandestine program, but still move Syria up the nuclear ladder."[100]

Therefore, it should be the main objective of IAEA policy and NPT safeguards to possibly rearrange its attitudes towards proliferative risks.

3.7 Could be the Libyan case applicable on the case of Syria or Iran?

"The Libya Model", an example intended to show the world what can be achieved through negotiation rather than force when there is goodwill on both sides."[101]

Currently, Libya can be considered as a promoter of global nuclear disarmament. Country´s representatives often challenged all countries of the world to follow its steps, starting with the Middle East and appealed on no exception or double standards. Gaddafi´s son Seif al-Islam, in this regard, described three main reasons why Libya halted its nuclear program and suggested the attitude towards other countries with nuclear ambitions.

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[99] Chris Mitchel, Memo to Washington: Iran Missiles Can Reach US http://www.cbn.com/cbnnews/insideisrael/2015/January/Iranian-ICBM-Can-Reach-the-US/ (23.04.15).
[100] Ibid.
[101] Hirsh, Michael, (11 May 2006),"The Real Libya Model",*Newsweek*. Retrieved 15 July 2006.

First factor, which changed Libyas nuclear strategy was the West´s promise of significant political, economic and cultural gains if it withdraws from programs to develop weapons of mass destruction. Second factor was the worsening diplomatic ties which
The West which evolved in the real security problem, therefore, the offer to cooperate rather than fight was in that situation convenient deal. However, as it was mentioned in the analysis of Libyan motives:

"A particularly important factor for the Libyan regime was the realization that regime change was not the United States' policy or intention."[102]

As Libya has tendency to halt its nuclear program earlier, but with Bush´s policy, it would have been seen as capitulation to the west.

The third reason was the notion of Palestina-Israeli conflict as it became clear that those two countries have achieved in five years of negotiations more than with fifty years of armed conflict. Therefore, military solution was proved to be not always only creadible way to achive satisfactory mutual agreement.

At the same time, however, in this context, it is important that international community should provide a clear statement about the reward for those countries, which would be eventualy willing to give up its nuclear ambitions. As a feasible solution could be seen for example commitment to not use WMD against countries that undertook significant steps toward halting its enrichment and other technological nuclear weapon capability.

Applying the Lybian case to Syrian situation. At first glance, it appears that Syria could be "a good candidate for the Libya treatment". According to several of his statements, it may seems that Syrian President Bashar al-Assad has the right inclinations to give up its nuclear program, but there are several reasons to argue that the Syrians will not have the same fate as Libya. Firstly, Bashar al-Assad has no control over the breadth of the government and security services to the same extent as Quadhafi had, Syria has also not much to offer in terms of diplomatic ties and may have feared that for commitment to halt

[102] St. John, Op. Cit., 393; Jon B. Alterman, "U.S.-Libyan Rapprochement: Lessons Learned," Paper written in Rome, 13 December 2004, 7. (22.04.15).

all the WMD activities it receives very little in return. Additionally, the US has expressed concerns over "the infiltration of insurgents from Syria into Iraq, the involvement of Syria in Lebanon and Syrian involvement in the Arab-Israeli conflict" so unlike Gaddafi, Syria´s regime can not point to a longer-term period in its history with a relatively good behavior. Instead, critics point to the "daily activities of Syria endangering the lives of US military personnel, Israeli civilians and even American civilians in Israel, Iraq, and beyond". Consequently, it seems that it would be harder to establish US-Syrian diplomatic ties, mainly due to the US perception of Syrian behavior as a "call for greater confrontation rather than reconciliation".

And finally, the Syrian oil reserves are rather declining resource and can not be compared with what Libya had or what their other regional states possess. Damascus is therefore not very lucrative for US business interests. Finally, Syria would likely demanded a large payment from the US government, similar to what Egypt has taken in response to Camp David, however, it is unlikely that Washington would repeat such a deal.[103]

Another analysed country is Iran. According to Jon B. Alterman argumentation in 2006, Iran was not a good candidate to be applied by Libyan case at that time:

„The system of checks and balances that thwarted the will of the Iran´s reformist parliament in the early part of this decade could scuttle a deal with the United States, raising fears that any bilateral agreement would represent a pact with only a single faction and invite entrepreneurial efforts by other factions to win their own gains."[104]

Former leader had therefore no interest in negotiation, hovewer current President Rouhani seems to be more inclined to cooperate with the West authorities. However, the situation is not that easy as with the Libya. The main goal is to find compromise between Iran´s request to maintain nuclear energy for peaceful purposes and diplomats´ concerns about likelihood of gaining nuclear weapons when they step aside to Iran´s demands too much. The negotiations started in November 2013 and the deadline for "comprehensive solution" was set to July 2014, despite "significant progress" being made, both sides agreed to prolong its negotiations and set another deadline to 1 March 2015. However, also this

[103]John. B. Alterman, Libya and the U.S: The Unique Libyan Case, http://www.meforum.org/886/libya-and-the-us-the-unique-libyan-case (22.04.15).

term did not bring any mutual agreement, so the "full details still have to be agreed before 30 June deadline". [105]

Reportedly, Iran´s offer is to "freeze the current number of operating centrifuges for three to seven years" and then requires "sufficient enrichment capacity to produce fuel for the Bushehr power plant". In return, Iran would ship "all of its stock of low-enriched uranium to Russia" and would be willing to accept "more intrusive inspections by the IAEA".[106]

The main obstacles seems to be in unanswered concerns about potential military dimensions to Iran´s nuclear programme and Iran´s "domestic political constraints". Also Iran´s request to lift UN sanctions quickly is not met with the P5+1 understanding as is believes that is "should happen in the final phase of any accord". [107]

In this regard, Lybian Ambassador to the United Nations Abdelrahman Shalgham states:

"We gave some devices, some centrifuges, for example for America, but what do you give us? Nothing .. .that's why we think North Korea and Iran are hesitating now to have a breakthrough regarding their projects."[108]

To be concluded, the negotiations between Iran and P5+1 is currently matter of time and willingness to compromise the requests on both sides. If they did not find mutual solution and the negotiations would collapse, there will be chance of worsening the crisis.

Thus, as was described, Syria and Iran are more complex problems than was Libyan case and this "model of disarmament" could not be applied on every nuclear proliferative threat.

3.8 Stopping proliferation before it starts

Chaim Braun and Christopher Chyba identify three broad and interconnected challenges of non-proliferation regime:

1) The latent proliferation. The state remains a member of the NPT and under the cover of Article IV develops the capacity to produce nuclear weapons.

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[104] Ibid.
[105] Iran nuclear crisis: Six key points, http://www.bbc.com/news/world-middle-east-32114862 (21.05.15).
[106] Ibid.
[107] Ibid.

2) The proliferation of the first degree. The material or technology obtained by non-nuclear states from private companies or directly from the nuclear states.
3) The proliferation of the second degree. Developing countries with different capabilities help and deal with each other.[109]

International efforts to stop the proliferation of nuclear weapons generally focus on states which are already suspected of developing such arsenal. Under impendence of sanctions or incentives for multilateral diplomacy, international security forces try to convice these states to halt their nuclear program. However, country as North Korea could preceive security asurance, influence and prestige derived from possessing nuclear weapon as more important so this „game" is unlikely to be won.
Therefore, would not be better to prevent proliferation before it starts? Concerned stated should be more focused on preventing the proliferation by the countries that have not made final decision about nuclear weapon procurement yet. However, detecting cladestine nuclear activity proved to be an almost impossible task. For example:

„The reason why such attention has been focused on Iran is because it hid a clandestine uranium enrichment programme for 18 years, in breach of the Nuclear Non-Proliferation Treaty."

Also it took five years than intelligence agencies discovered Syrian nuclear reactor at Al-Kibar. Thus the strategy of preventing proliferation would require that the international community improve its ability to detect suspicious activities. The main obstacle with this regard is the dependence on open-source information. The IAEA has to rely on willingness of the NPT Member States to provide access to sensitive information and facilities. Furthermore, combating the proliferation of nuclear weapons is not only a task of finding cladestine nuclear facilities and technologies, it is also important to understand and predict

[108]Libya Frustrated by Payback of Abolishing WMD Programs, http://www.nti.org/gsn/article/libya-frustrated-by-payback-for-abolishing-wmd-programs/, (15.05.15)
[109] . "Libyan leader laments no "concrete" reward for giving up WMD," Rome RAI Tre Television Network [in Italian], 17 December 2004.

what national and regional incentives can lead a country´s leader to acquire a nuclear weapon program.

Therefore, future success in exposing unreported nuclear activities will depend largely on the international agencies. IAEA should be more detectives than officers.They have access to facilities and information which are not available to any other authority. Thus they can utilize the complex overview and predict where could be possible threat. Under the condition that any information will not be used to advance and not by policisize, the ability of the IAEA to reveal cladestine activities will also increased if the NPT Member States will be willing to share more sensitive information and undergone the inspections regurarly and more often. International agencies should also actively dissuade countries from developing nuclear weapon capability by enhancing those countries´security.

As the analysed countries in this work, Iran and Syria, perceive the biggest security threat in the Israel monopoly in the region, it could be advisable for the West to consider negotiation with Israel about its nuclear disarmament. Considering the fact, that US-Israeli relations are very positive it would be possible to set a mutual agreement. For example Israel would gave up his weapons in return for US security assurance in the potentional conflict. It is however questionable, how would thus Syria and Iran perceive Israel then as it would be without nuclear weapon however under umbrella of the delicate US military forces. From the Israeli perspective it is impossible to gave up its arsenal without any external security asurance as it is located in very hostile region and without appropriate detterent, it would be very vulnerable.

There is also a question how it would appear if Syria and Iran would be let to develop the nuclear weapon arsenal. The balance with their rival would be restored, however there is possibility that other surrounding states would feel vulnerable and decide to develop their own nuclear destructive mean as well. This could lead to nuclaer armed race, but hypotheticaly, would not the increased number of nuclear weapons possessors decrease the prestige status and influence of nuclear weapon? Moreover, if the two potential rivaling states have both nuclear arsenal, would they have use it in the military conflict? The destructive consequences would be enormous, so would not be better to use “weaker” conventional weapons? These questions need to be analysed in broarder context.

Conclusively, IAEA and NPT authoritatives should take their lecture and according to historical experience and change the rigid structure of Non-proliferation Threaty and expand

the competence of IAEA inspectors and not fixing to already suspected states but prevent proliferation in states which have not deciced for nuclear weapon arsenal yet.

CONCLUSION

The diploma thesis provided a theoretical introduction to the topic and analysis of the state´s intention. To sum up the findings and answer the questions put at the beginning, it has to be concluded that it is very difficult to assess analysed countries intentions using Sagan´s models. All of the three possible motivation provide credible reasons and arguments that could be applied to the analysed countries and explain their potentional calculus, however, finding evidence to provide reliable prognosis is nearly impossible.

Considering the intentions of the selected countries, according to available information, Iran is vey likely interested in building nuclear weapon, however, in the near future, Iranian nuclear arsenal would not serve as a credible deterrent against its most dangerous enemy, the US, therefore it is unlikely that Iran would initiate nuclear bombing. Moreover, the negotiations about Iranian nuclear between Iran and the West are still in progress. Therefore, it is matter of time, how will the situation in the Middle East develop. As for the case of Syria, it needs to be conclude, that Syria could be a potential candidate for nuclear proliferation, however, due to ongoing civil war in the country, it is plausible that Syria would change the strategy in the near future and could pursue to establish closer ties with the West and rather focus on nuclear energy primarily on civilian research. Lybia could not be considered as candidate for nuclear proliferation as it halted its nuclear program in 2003 and currently lacks all the capabilities to develop nuclear arsenal. The only threat could be seen in scientist involved in nuclear program, whose knowledge can be very useful for other countries or for extremist group within the country.

It is unsure if we are "are condemned to repeat" the history, however, I would like to conclude my diploma thesis with the words of John Hersey:

"What has kept the world safe from the bomb since 1945 has not been deterrence, in the sense of fear of specific weapons, so much as it´s been memory. The memory of what happened at Hiroshima"[110]

As long as the monstrosity of Hiroshima and Nagasaki remain in our minds, it is unprobable that any state would dare to use a nuclear weapon against other state as first.

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[110] John Hersey, Hiroshima: The Aftermath, July 15, 1985.

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