RECONCILIATION, RESTORATION, AND RECONSTRUCTION OF A CONFLICT RIDDEN COUNTRY

DISSERTATION

Muhammad Sharjeel Riaz, Group Captain, PAF

AFIT-ENS-DS-22-J-052

DEPARTMENT OF THE AIR FORCE
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Group Captain, PAF

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Abstract

Conflict has sadly been a constant part of history. Winning a conflict and making a lasting peace are often not the same thing. While a peace treaty ends a conflict and often dictates terms from the winners' perspective, it may not create a lasting peace. Short of unconditional surrender, modern conflict ends with a negotiated cessation of hostilities. Such accords may have some initial reconstruction agreements, but Reconciliation, Restoration and Reconstruction (RRR) is a long term process. This study maintains that to achieve a lasting peace: 1) The culture and beliefs of the conflict nation must be continuously considered and 2) RRR is a long term effort which will occur over years not just in the immediate wake of signing a treaty or agreement. To assure the inclusion of all stakeholders and gain the best results in dealing with this "wicked problem", an array of Operations Research techniques can be used to support the long term planning and execution of a RRR effort. The final decisions will always be political, but the analysis provided by an OR support team will guide the decision makers to better execute consensus decisions that consider all stakeholder needs. The development of the value hierarchy framework in this dissertation is a keystone of building a rational OR supported long term plan for a successful RRR. The primary aim of the research is to propose a framework and associated set of guidelines derived from appropriate techniques of OR, Decision Analysis and Project Management (right from development of a consensus based value hierarchy to its implementation, feedback and steering corrections) that may be applied to help RRR efforts in any conflict ridden country across the globe. The framework is applicable to any conflict ridden country after incorporating changes particular to any country witnessing a prolonged conflict.

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Muhammad Sharjeel Riaz

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RECONCILIATION, RESTORATION, AND RECONSTRUCTION OF A CONFLICT RIDDEN COUNTRY

1. Introduction

1.1 Background

Since the dawn of time, mankind has suffered from the menace of conflicts and wars; even today, war clouds loom over a significant region of the globe. There were 52 active conflicts in 36 different countries in 2018, compared to 50 conflicts in 33 countries in 2017 (Havard Strand, 2019). Of the six major conflicts classified as wars at that time, Afghanistan had accounted for 49% of the total casualties. Syria, Yemen, Somalia and Afghanistan collectively accounted for 82% casualties in 2018. Clionadh Raleigh of the Armed Conflict Location and Event Data Project (ACLED) highlights that in the past decade, the world environment has witnessed a decline in global cooperation and security. She states that this is due to multiple internationalized wars and massive humanitarian crises; rising nationalism from global powers, transnational terror; organizations using sophisticated recruitment techniques; cyber-attacks orchestrated by marginalized states; sustained levels of violence in nominally 'post-conflict' countries; and a drastic rise in the number of non-state violent agents (Raleigh, 2020). Ongoing conflict in Ukraine underscores this tragic world condition.

As an example, consider the situation in Afghanistan, a few months before the U.S withdraw. Zalmay Khalilzad, the US special envoy for peace in Afghanistan, in a series of tweets on 14 December, 2020 posted, "Tragically, the war continues. The need for a political settlement, reduction in violence, and a ceasefire remain urgent," Khalilzad had been actively involved in winding down the 20-year-old Afghan war, the longest overseas military intervention in U.S. history.

The World at War in 2020

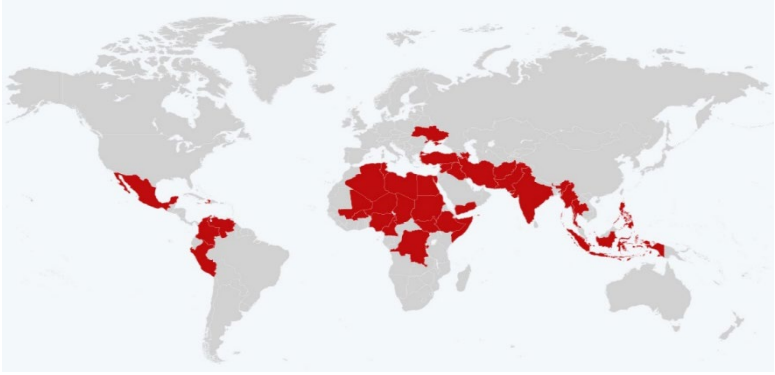

Figure 1 The World at War Source: ACLED Project May 2020

As the 20th year of the US conflict in Afghanistan ended in September, 2021, the uncertainty after US withdrawal looming on the horizon, decades of violence has left Afghanistan, like most prolonged conflict regions, in need of construction or reconstruction. Almost all the facets that comprise a functioning modern nation-state like justice and law department, security, socio economic, and public health, are in disarray with no reforms in sight. Every aspect of the Government has suffered damage from decades of conflict-induced, destruction, neglect and distortions. While the events have dramatically unfolded in Afghanistan, Figure 2 and 3 highlight the rapid control gained by Taliban in a matter of weeks in 2021. Since the US withdraw, they nominally control the entire nation. The effects of Taliban takeover are yet to be fully revealed; however, it is evident that although the size and capability of the Afghan governing structure had increased significantly since the Taliban regime fell in late 2001, the government institutions remained rife with corruption and ethnic tensions. (Whitlock, 2019). Political tensions among its major factions are still present. Just recently a former Afghan general has called to Afghans to join him in fighting the Taliban, while a

number of warlords remain in control of their regions of the country. The 2015 elections were marred by allegations of vast fraud and resulting post-election political crises (Katzman, 2015). The 2019 elections have also been full of controversy, where the results were announced after 5 months and the verdict has been challenged by competitors[1]. The corrupt practices by those at the nation's helm, coupled with role of war lords in some provinces, further worsened the situation; Afghanistan was ranked at 172 out of 180 countries in corruption by Transparency International in its 2018[2] report.

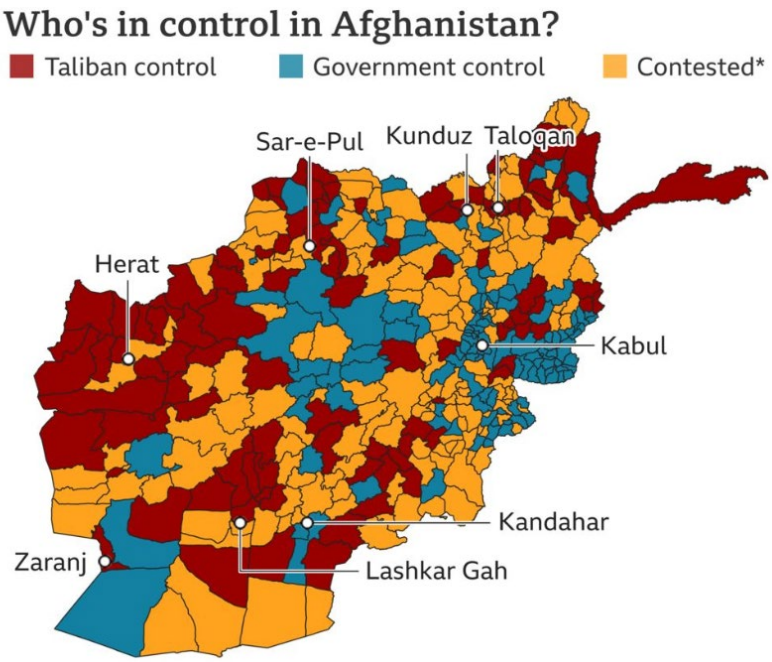

Figure 2 Areas of Control in Afghanistan March 2022

Figure 4 highlights the relative ranking of Afghanistan with its neighbors and countries experiencing conflict. Afghanistan was at the lowest percentile in 2018 according to the Worldwide Governance indicators assessed by World Bank[3]. Interestingly, the

[1] [1] https://www.nytimes.com/2020/02/18/world/asia/afghanistan-election-ashraf-ghani.html accessed 24 Feb,2020

[2] [2] https://www.transparency.org/country/AFG Accessed 30 Aug ,2019

[3] http://info.worldbank.org/governance/wgi/Home/Reports accessed 28 July,2020

indicators for the value for Rule of Law and Government effectiveness were -1.79 and -2.18 (within a permissible value of -2.5 to 2.5) respectively. The values in 2018 have slightly improved to -1.67 and -1.46 for each aspect which is still very low and remains unsatisfactory.

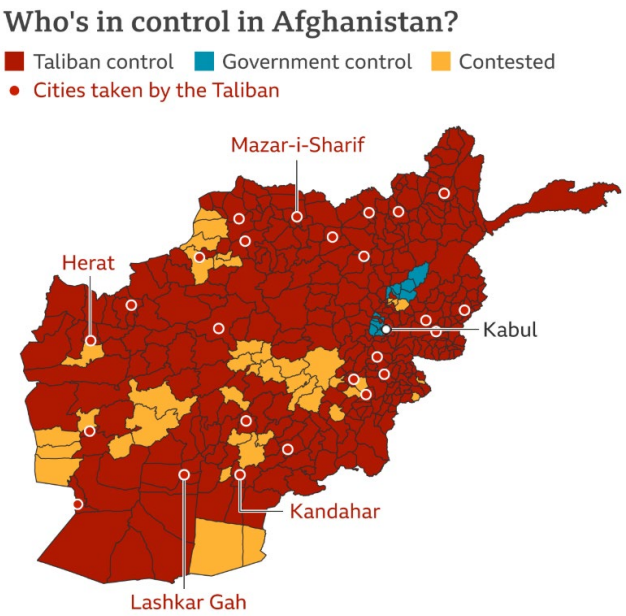

Figure 3 Areas of Control in Afghanistan August 2022[4]

The United States, and to a lesser extent its coalition partners, the UN, NGOs, and the World Bank, have injected billions of dollars into what is commonly termed the "reconstruction" of Afghanistan since the current conflict began in 2001. However, all the indicators highlight a chronic problem that remains to be solved. This brief snapshot of Afghanistan and its chronic problems draw attention to the unsuccessful attempts of the global stake holders in resolving them after the US led intervention in 2001. Similar crisis are going on in Iraq, Syria, Yemen, Ukraine and other nations. A UN report

[4] https://www.bbc.com/news/world-asia-57933979 accessed 16 Aug 2021

highlights that before the conflict in Syria, nearly every child was enrolled in primary school, but by 2013, about 1.8 million children and adolescents were out of school. It took just two years of civil war to erase most of the education progress made since the start of the century. Today, some 50% of the 1.4 billion people living in countries impacted by crises and fragility are under the age of 20 (OECD, 2015).

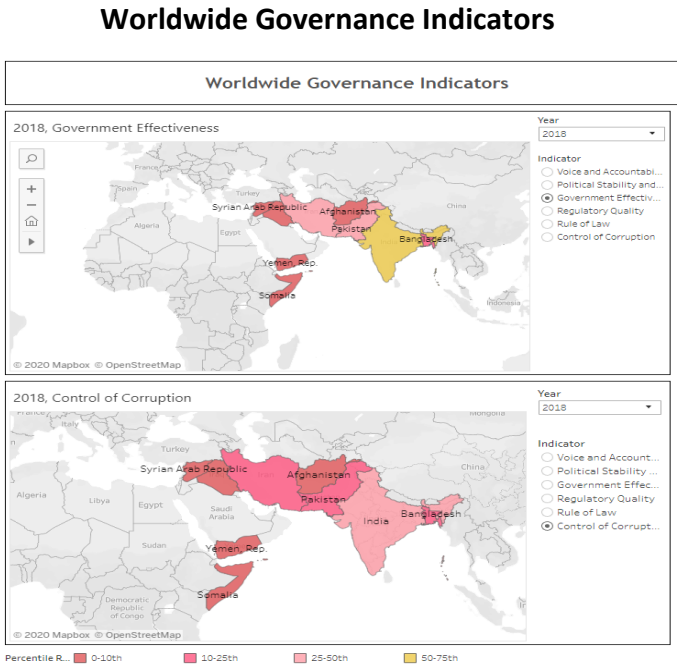

Figure 4 Worldwide Governance Indicators for the region in 2018[5]

Figure 5 highlights the map of fifty countries and economies of fragile countries sampled in 2015. 23 of these countries have been featured on all lists since 2007 and 43% of the population of these countries lives on less than 1.25 USD a day. The situation in Yemen, Somalia and DR Congo is much like Afghanistan after years of armed conflict.

[5] http://info.worldbank.org/governance/wgi/ accessed 25 May,2022

Cognizant of the problem, U.N Secretary General Boutros-Ghali proposed the concept of "peace-building" in his Agenda for Peace (Boutros Ghali, 1992). The UN's strategy for resolution of conflict, consists of four components;

(a) Preventive Diplomacy

(b) Peacemaking

(c) Peacekeeping

(d) Post Conflict peace-building

Fragile States and Economies

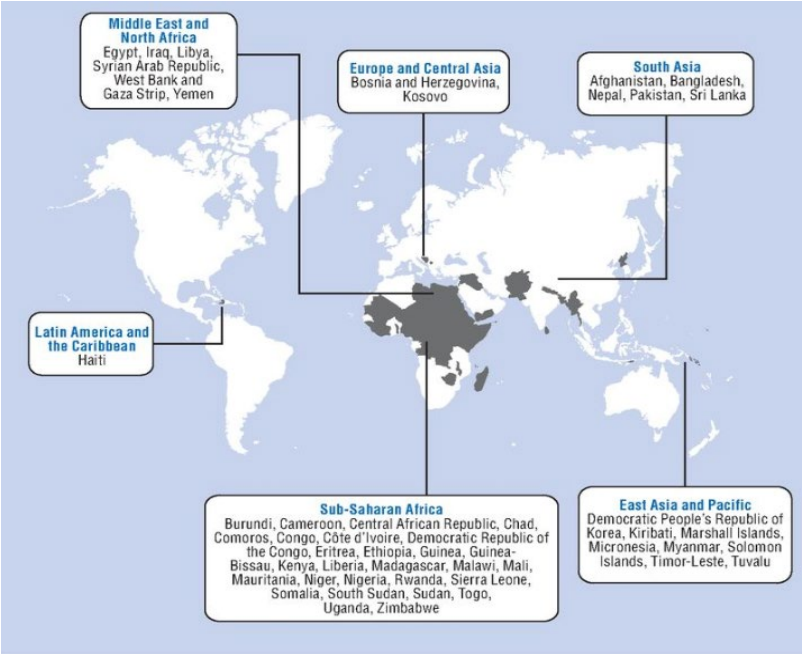

Figure 5 List of fragile states and economies (OECD, 2015)

1.2 Post Conflict Reconstruction Efforts

In the last few decades. The United States has played a prominent role in rebuilding countries after a conflict. Interestingly, be it in post war Germany or Japan, the battle ridden African countries or conflict intense Iraq or Afghanistan, the US has participated at least 16 times in efforts to rebuild these conflict nations both politically and

economically (Minxin Pei, 2003). However, with the exception of Japan and Germany (See Table 1), the desired results, despite massive efforts, have been found wanting. At the same time, US allied and coalition actions, for an array of reasons, have not always been totally welcomed by these conflict ridden countries. The fact that US popularity has declined significantly in the last decade, especially in the Middle East, is supported by a Wilson Center study (Wilson Center, 2012) carried out across the Middle East and supplemented by Stephen Cook in his February 2019 article "The Middle East Doesn't Admire America Anymore" in *Foreign Policy*[6] . The latest poll[7] conducted by Arab Barometer and published by Newsweek in February 2021 confirms the declining popularity of U.S within Arab states. As David Edelstein eloquently asks in his 2004 article (Edelstein, Ocupational Hazards, 2004), why do some military occupations succeed while others fail? He concludes at the time that there is almost no academic literature answering this question, but he stresses that nation building is not the central goal of occupations, and, further, not all occupations aim to build nations. Rather, Edelstein suggests that the primary objective of military occupation is to secure the interests of the occupying power and prevent the occupied territory from becoming a source of instability (Edelstein Ocupational Hazards 2004). Edelstein also stresses that military occupations usually succeed only if they are lengthy; unfortunately, lengthy occupations often elicit nationalist reactions that impede success. Further, a lengthy occupation produces tensions in impatient occupying powers that would prefer to withdraw forces and funds. To succeed, therefore, occupiers must both maintain their

[6] https://foreignpolicy.com/2019/02/05/the-middle-east-doesnt-admire-america-anymore/ accessed 25 March,2020

[7] https://www.newsweek.com/china-delighted-see-top-us-arab-countries-1570341 accessed 25 Sep, 2021

own interest in a long occupation and convince an occupied population to accept extended control by a foreign power (Mueller 1973).The ongoing war on terrorism has taken longer than what everyone publicly perceived. In addition, the process of rebuilding Afghanistan and Iraq has not met success; the political changes in Libya, Lebanon, Yemen, DR Congo, Somalia and Syria, will eventually require rebuilding those nations and bringing relief to their people. The US government may not be directly involved in all these efforts; however, the stature of the US as a global powerhouse merits considering an innovative model containing a local population's perspective. Table 1 highlights the US efforts in conflict ridden areas in the past decades. Looking back, Operation Enduring Freedom (7 October, 2001- 28 December, 2014) was definitely an effort to secure US interest in particular and the Global interest in general against the menace of terrorism. However, *The New York Times*, in an early editorial note in its 27 September 2001 issue, wrote that[8]:-

"The United States has a long and calamitous history of toppling unfriendly foreign governments. The damaging repercussions of cold-war coups in Iran and Guatemala haunt Washington to this day. As President Bush draws up plans to deal with Afghanistan, apparently the first target in the war against terrorism, he must do a better job than some of his predecessors in thinking through the potential consequences of American intervention. There are a lot of tripwires on the road to Kabul. Mr. Bush has begun suggesting that the Taliban should be overthrown. But engineering the ouster of the Taliban, which have let Osama bin Laden hide out in Afghanistan for years, could engulf Afghanistan in civil war, aggravate a growing refugee crisis on Afghanistan's borders and even destabilize Pakistan. Any of these developments would embolden terrorists and undercut American interests".

The opinion author is to be commended for his insight and prediction as this is precisely what has happened and continues happening today in Afghanistan.

[8] https://www.nytimes.com/2001/09/27/opinion/nation-building-in-afghanistan.html accessed 26 May,2018

Interestingly Diana West in her blog[9] titled "Nation building in Afghanistan: It did not work the first time" on 04 October, 2009 quotes the statement of Gen McChrystal in London*;*

> *"We don't win by destroying the Taliban," he said. "We don't win by body count. We don't win by the number of successful military raids or attacks, we win when the people decide we win."*

That is the one of the key points highlighted in this research. For the Reconciliation, Restoration, and Reconstruction (RRR) required for a nation building process to be successful, it *must* be embraced and accepted by the local people. This will be most effective if the nation building effort aligns with the cultural and religious norms and values upon which the people have been raised. This same point has been highlighted by the Special Inspector General for Afghanistan Reconstruction (SIGAR) report[10] for The Lessons Learnt Program (LLP).

[9] http://www.dianawest.net/Home/tabid/36/EntryId/1053/Nation-Building-in-Afghanistan-ItDidnt-Work-the-First-Time.aspx accessed 26 May,2018

[10] https://sigar.mil/pdf/lessonslearned/SIGAR-16-59-LL.pdf accessed on 28 may, 2018

United States Led Nation Building since 1900 to 2003

TARGET COUNTRY	POPULATION	PERIOD	DURATION (YEARS)	MULTILATERAL OR UNILATERAL?	TYPE OF INTERIM ADMINISTRATION	DEMOCRACY AFTER 10 YEARS?
Afghanistan	26.8 million	2001–	19+	Multilateral	U.N. administration	No
Haiti	7.0 million	1994–1996	2	Multilateral	Local administration	No
Panama	2.3 million	1989	< 1	Unilateral	Local administration	Yes
Grenada	92,000	1983	< 1	Unilateral	Local administration	Yes
Cambodia	7 million	1970–1973	3	Unilateral	U.S. surrogate regime	No
South Vietnam	19 million	1964–1973	9	Unilateral	U.S. surrogate regime	No
Dominican Republic	3.8 million	1965–1966	1	Unilateral	U.S. surrogate regime	No
Japan	72 million	1945–1952	7	Multi-	U.S. direct	Yes
West Germany	46 million	1945–1949	4	Multilateral	Multilateral administration	Yes
Dominican Republic	895,000	1916–1924	8	Unilateral	U.S. direct administration	No
Cuba	2.8 million	1917–1922	5	Unilateral	U.S. surrogate regime	No
Haiti	2 million	1915–1934	19	Unilateral	U.S. surrogate regime	No
Nicaragua	620,000	1909–1933	18	Unilateral	U.S. surrogate regime	No
Cuba	2 million	1906–1909	3	Unilateral	U.S. direct	No
Panama	450,000	1903–1936	33	Unilateral	U.S. surrogate regime	No
Cuba	1.6 million	1898–1902	3	Unilateral	U.S. direct	No

Table 1 United States Led Nation Building since 1900 (Minxin Pei, 2003)

1.3 Problem Statement / Research Questions

This research planned to inquire, analyze and attempted to address some fundamental questions concerning Reconciliation, Restoration and Reconstruction (RRR) of a conflict ridden area. After considering the magnitude of war/limited intensity conflicts ongoing in the world today, the following questions were put forth:

(a) Is there an existing acceptable methodology to implement restoration and rebuilding of a conflict area both in the near term and over the long term?

(b) Do these restoration and rebuilding efforts adequately take into account the religious and cultural perspectives and values of the people of affected region?

(c) What is the usual outcome of these efforts historically and what are the salient reasons for such efforts to be viewed as being not successful?

(d) In order to effectively execute RRR efforts, is there a feasible approach or framework that is synchronous with the modern analytical techniques established in academia and practice that can be made acceptable to support *all* stake holders.

Iraq, Afghanistan, Syria, Ethiopia, Yemen, Somalia, Colombia, Venezuela and the recent addition of Nagorno-Karabakh and Ukraine are a few countries requiring or will require committed rebuilding and restoration after experiencing continued violence and conflicts. This research explored an Operations Research/Decision Analysis solution framework to support RRR that incorporates the values and preferences of the local population alongside the other stake holders. The proposed framework is based on the established techniques of Operations Research. By including "Soft OR" techniques with more traditional OR analysis, a resultant set of guidelines to support a solution, if explored, refined and implemented, is likely to develop an ownership with the local population and will not be viewed as an external agenda imposed by invading, warring, or however well intended outside entities. Moreover, a solution developed by all stake holders is likely to better bear the test of time and stand out as a sustainable and perpetuate progress when compared with similar efforts in history. The research proposes a modeling framework for the rebuilding, restoration and reconciliation of any conflict ridden area. A key element of the proposed framework is that it takes into

account the values of all the stake holders *including* the local players. It is believed that, with the required adjustments based on local values, dynamics and constraints, the proposed framework will be applicable for undertaking RRR of any conflict ridden area after required adjustments. Additionally, the framework is based on accepted practices in the field of Decision Analysis and Consensus Building faculties of Operations Research.

1.4 Rationale for Selecting Operations Research Techniques

In order to reconstruct and rebuild a country, Operations Research (OR) is considered a discipline that is suitable for adoption and implementation to support decision making for a variety of reasons. While military and industrial planners have long used OR analysis to support complex decision making, it has been less prominent in supporting diplomatic decisions in nation building decisions. The decision makers who are the stake holders, a set of situations where complex decisions are to be made, the presence of uncertainty, and optimizing the implementation of agreed upon plans all are facets related to Operations Research. This research describes a framework for the entire process right from development of a consensus based value hierarchy to its implementation, feedback and steering corrections. The biggest dividend is the credibility and transparency supplemented by rational analysis and logical presentation of the entire process. These foundations are likely to instill confidence in all stake holders, donors and the people who dearly want a sustained and viable peace in their conflict ridden region. The credibility is in terms of principles and techniques of OR, which are considered valid and adopted by the modern world for a number of applications. Thus applying the techniques of OR for Reconciliation, Restoration and Reconstruction of a conflict ridden country is considered suitable, implementable and fruit bearing.

1.5 Research Assumptions

The proposed process of developing a framework for Reconciliation, Restoration and Reconstruction (RRR) of a conflict ridden country will be highlighted in the subsequent paragraphs. The key assumptions for the research are:-

(a) The ultimate aim for all the stake holders is to enable a sustainable peace in the region. This assumption may seem at first glance to be idealistic; however, it is believed that conflicting parties after a prolonged conflict find it difficult to sustain their agendas as proven through the annals of history. It is understood that while the conflicting parties are assumed to want a sustainable peace, the price each one of them is ready to pay is different.

(b) The stake holders represent all the faction/ parties that have a stake in the conflict torn country. These stake holders will form a core committee where representation to each stake holder group is ensured.

(c) Instead of a single decision maker, the empowered core committee, representing all stake holders, will reach group decisions through consensus.

(d) For the purposes of this research, consensus requires that at least 2/3 or more of the members of core committee agree to a group decision given that every voting member has an equal weight. The non-agreeing members are assumed to respect the decision of the majority and cooperate fully in subsequent phases.

(e) All stake holders agree to discuss and customize their objectives in line with the preferences and values of the local populace.

(f) The promised funds pledged for the entire efforts will be made available when required according to the mutually agreed schedule by the core

committee and the funding parties which are represented on the core committee.

(g) An appropriate international organization like the United Nations, Organization of Islamic Conference (OIC) or European Union will oversee the entire process and will be responsible to implement the entire program as developed by the stake holders.

It is also assumed that RRR is a long term political process with near term, mid- term and long term goals that may morph over time, but must be met to attain a truly viable peace. It is, however, a process that operations research can be applied to assist ultimate decision makers to review alternative proposals. The key assumption for the entire framework remains the ultimate goal of establishing a sustainable and viable peace and reconstructing a conflict ridden country. This goal is believed to be unanimously agreed by all stake holders.

1.6 Research Aim

The primary aim of the research is to propose a framework and associated set of guidelines derived from appropriate techniques of OR that may be applied to help RRR efforts in any conflict ridden country across the globe. The framework shall be applicable to any conflict ridden country after incorporating changes peculiar to any country witnessing a prolonged conflict.

2. Literature review

2.1 Introduction

This chapter presents a brief literature review to include concepts imperative to Consensus Building, development of value hierarchy in a group decision making situation and project management with associated challenges in developing world and handling of data for conflict ridden countries. While deliberating on consensus building, the chapter also highlights the concept of Fuzzy Sets, Linguistic variables and their relations. The idea of Hesitant Fuzzy Linguistic Term Set (HFLTS) is also discussed for subsequent application in the achieving consensus.

2.2 Consensus Modeling

> *"Consensus: "The process of abandoning all beliefs, principles, values, and policies in search of something in which no one believes, but to which no one objects; the process of avoiding the very issues that have to be solved, merely because you cannot get agreement on the way ahead. What great cause would have been fought and won under the banner: 'I stand for consensus?"*
>
> *Margaret Thatcher*

While Mrs. Thatcher's quote seems to oppose consensus, short of unconditional surrender, modern conflict requires the development of a consensus solution to attain a lasting, viable peace. Even when surrender has been reached, consensus between the victors (the abandonment of Wilson's 14 Points at Versailles, for example) or the necessity to acquiesce to cultural norms to facilitate a peace (allowing the Japanese to retain the Mikado, although with reduced powers) has been required.

Consensus is defined by Merriam – Webster's Dictionary as "general agreement" or "the judgement arrived by most of those concerned." "Seeds for Change" a UK based social organization, considers consensus decision making a creative and dynamic way of reaching agreement between all members of a group. Instead of simply voting for an item and having the majority of the group getting their way while risking the tyranny of the majority, a group

using consensus is committed to finding solutions that everyone actively supports, or at least can live with (SFC, 2013). Throughout the course of human history, lack of consensus on a common ground has led to disagreement, conflict of interest and ultimately use of force. Jackson and Morelli highlight there has to be a failure in bargaining if for some reason there is an inability to reach a mutually advantageous and enforceable agreement (Jackson & Morelli, 2009). Therefore, consensus amongst a group of people is vital to achieve a common goal where the objectives may be contrasting. Consensus is neither compromise nor necessarily unanimity; it aims to go further by weaving together everyone's best ideas and key concerns in a process that often results in surprising and creative solutions, inspiring both the individual and the group as a whole (Black 2019). Involving more people in the decision making process can greatly improve the quality of decisions and outcomes. However, involving more people can also increase conflict and generate other challenges (Black, 2019). Achieving consensus for a diverse group is an art that requires effective moderation by a skilled facilitator (Butler & Rothstein 1987).

Group decision making has always been a challenging task, especially when the decision makers (DMs) are people representing different skill levels and different specialties. When dealing with a diverse group of stake holders for any RRR effort, it is likely to happen that the group decision makers are comprised of people with different cultures, educational backgrounds and different set of values. Since this research employs OR techniques to achieve consensus, it is imperative that a methodology to extract meaningful information is also specified. The research recommends the use of Hesitant Fuzzy Linguistic Term Set (HFLTS) (to be discussed later in the chapter) for extracting meaningful information from the decision makers with varied backgrounds. It is important to consider that eliciting preferences and meaningful information that can be used for mathematical modeling is an arduous task from a single decision maker; collecting meaningful information without any distortion from a group

of people can be even more challenging (Francisco Javier Cabrerizo, 2015). Similarly, when dealing with specific numerical values, it is relatively easier to infer information from DMs and then use it in a mathematical model (Bandemer & Gottwald 1995). However, when dealing with problems of social development, with abstract problems that involve human lives, it is often difficult to assign a numerical value in terms of value preference (Bandemer & Gottwald 1995). Despite the challenges, achieving consensus remains a unifying ground for all stake holders. It is pertinent to briefly review the situations where consensus decision making may be implemented.

2.2.1 **Situations for Consensus Decision Making**. After noting the complexities of group/consensus decision making, it is worthwhile to review situations where it is considered a preferred choice by subject matter experts. The United States' Federal Emergency Management Agency (FEMA) has posted lessons[11] to educate the populous for various emergency situations. While addressing group decision making situations, FEMA highlights that group decision making may be preferred under the following conditions:-

- The situation is complex.
- Consequences are significant.
- Commitment and buy-in are important.
- There is time for deliberation and consensus building

A questionnaire to choose between individual decisions versus a group decision is displayed in the Table 2[12] where FEMA proposes that if the answer to the majority of the questions is in affirmative then one shall opt for group decision making. While these questions and

[11] https://emilms.fema.gov/IS0241b/DMPS0102summary.htm Accessed 21 July, 2019
[12] Ibid.

situation are quite generic in nature, they can also be applied to public policy problems, and thus, RRR efforts in a conflict ridden country remains a relevant situation.

It is likely that for cases of public policy, such as reconstructing a war torn country, group decision making appears to be a logical choice based on Table 2. Importantly, Seeds for Change advocates (SFC, 2013) that the key for a group working towards consensus, is for all members of the group to express their needs and viewpoints clearly, recognize their common ground and find agreeable solutions to any areas of disagreement.

FEMA Questionnaire

Question	Yes	No
Do you have reasonable amount of time to make the decision?		
Does the leader have enough expertise to make a good decision?		
Do the potential members have enough expertise to make a good decision?		
Do the others involved share the organizational goals to be attained by solving the problem?		
Is the decision complex with many possible solutions?		
Is commitment to the decision by other people critical?		
Is the decision likely to cause serious conflict among the people affected by it?		
Will the decision directly impact many agencies, individuals, or community members?		
Will the decision directly impact only a select few?		

Table 2 FEMA Questionnaire

2.2.2 Modalities of Reaching Consensus The process of achieving consensus is highlighted in Figure 6, taken from the 2013 Seeds for Change publication (SFC 2013). It shows how a discussion evolves during the consensus process. At the beginning, it widens out as people bring different perspectives and ideas to the group. This provides the material needed for a broad ranging discussion (the middle section) which explores all the options and helps people understand each other's concerns. This can be a turbulent and sometimes difficult stage – people might be grappling with a number of competing or contradictory ideas – but it is the most creative part.(SFC 2013) Finally, the group finds common ground and weeds out some of the options, combining all the useful suggestions into a proposal. The third stage shows this convergence of the discussion, culminating in the decision.

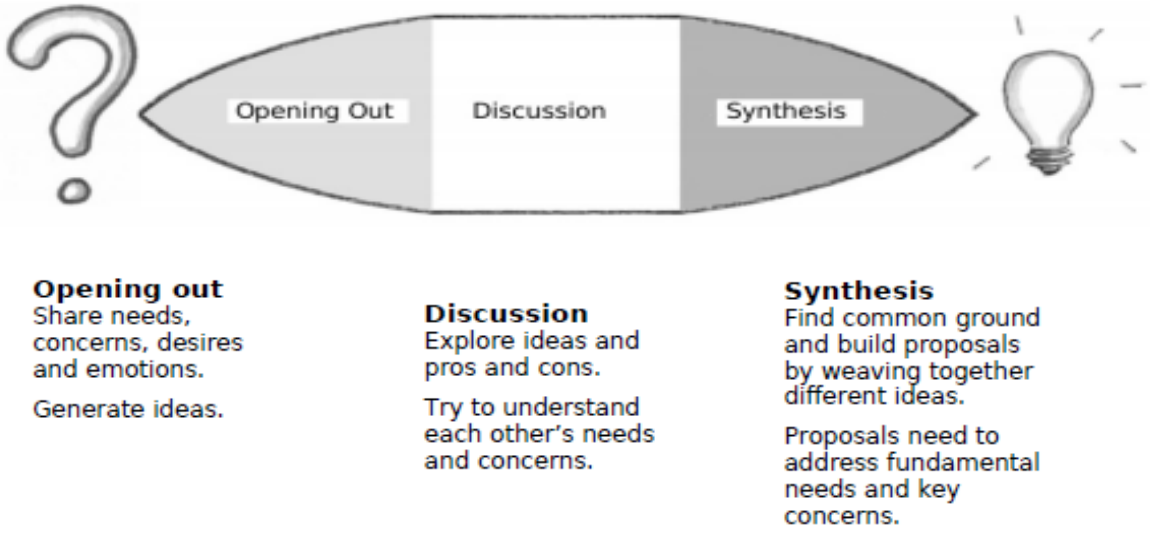

Figure 6 Evolution of discussion during consensus process (SFC, 2013)

On a similar note, Lawrence Phillips talks about Decision Conferencing and the role these conferences play in consensus decision making, noting that an unexpected event led to the development of decision conferences (Phillips 2007). The central idea of the contact meeting according to Phillips was that good information and data are best obtained directly from the decision maker and that perspectives shift and change as information is exchanged. Franco and Montibeller advocate the idea of facilitated modelling where instead of acting in an

expert mode in an analysis, the analyst facilitates the process of consensus decision making amongst various stake holders who often have conflicting perspectives, objectives, values and interests (Franco & Montibeller 2009, September). This research also supports the idea of facilitated modelling versus the expert mode because of the nature of our problem. The expert mode assumes the existence of an optimal solution to a problem based on real entities which is not the case in our research scenario. In a facilitated mode, the group from the organization is responsible for decision making and the analyst facilitates them in an interactive manner. The facilitated model also assumes the problems to be socially constructed entities (Colin 1982) where subjectivity is unavoidable (Keeney 1992) and clients want "satisficing" solutions instead of optimal solutions (Colin 1982). Therefore, the concept of facilitated modelling is a better representation of our research problem.

2.2.3 Example of Consensus reaching process in the Military. An example of group decision making or consensus modeling in the military field is the analysis of Base Closure and Realignment (BRAC) which was conducted by Paul Ewing Jr, W Tarantino and G Parnell in 2005. The analysts in their article describe how they used decision analysis to support the US Army's decision makers (Ewing, Tarantino and Parnell 2006). The authors believed to have offered valuable contributions in the following domains:-

(a) An instructive application of multiple-objective decision analysis methods to portfolio selection.

(b) A useful method for constructing scales for interdependent attributes.

(c) A new method for assessing weights that explicitly considers importance and variation (Swing Weight Matrix).

(d) Practical advice on how to use multiple objective decision analysis methods in a complex and controversial political environment.

A RRR scenario is likely to have a political environment with contrasting interests of stake holders therefore, multi objective decision analysis remains a valid application for such an environment as highlighted by Ewing *et al* in their 2006 report (Ewing, Tarantino and Parnell 2006) . It can only be effectively done with the help of good DA practices and the art of facilitation, which is another dimension and a key attribute to possess in an analyst's skillset. In 1992, a new group problem-solving structure entitled the "Stepladder Technique" was introduced (Rogelberg, 1992). The stepladder technique is intended to alleviate the problems associated with group decision making by structuring the entry of group members into a core group and by ensuring that each member contributes to the decision-making process.

However, ultimately the entire process involves human behavior, psychology, mathematics with some biases and hinges on a fine balance between art and science.

2.2.4 Different Values of the Decision Makers. The decisions of different decision makers will often be different in the same scenarios. Ralph Keeney attributes these varied decisions to different values of the decision makers. He stresses two basic reasons to establish values to focus our thinking on important policy decisions (Keeney 1992). Firstly, these values provide a basis for quality analysis that can provide insight and guidance leading to better decisions. Secondly, it reduces the likelihood of poor decisions. When the values are explicitly stated, it makes it harder for politics to proceed without the checks and balances of common sense. It makes it more difficult for claims to be made that the public interest is served when the information logically integrated with the public values indicates this is not the case. Keeney claims that in both situations, greater benefit is accrued from the resources allocated to address important policy problems (Keeney, 2006).

2.2.5 Decisions in the context of Game Theory and Negotiations. James K. Sebenius investigates the connection between negotiating for decisions and links them to the game theory (Sebenius, Negotiation Analysis: Between Decisions and Games 2007). He highlights that game theory has been especially useful for understanding repeated negotiations in well-structured financial situations. It has offered useful guidance for the design of auction and bidding mechanisms. It has uncovered powerful competitive dynamics, has usefully analyzed many "fairness" principles, and is used both on its own and in applications such as microeconomic theory and the economics of business strategy and industrial organization (Sebenius, Negotiation Analysis: Between Decisions and Games 2007).

2.2.6 Negotiations constitute an important element of consensus decision making. Owing to the strong desire to predict equilibrium outcomes emanating from game theory, negotiations lack prescriptive power especially in financial issues (Sebenius, Negotiation: Statistical Aspects 2015). Three major aspects of mainstream game theory, discussed at length in Sebenius's 1992 work titled "On offers that can't be refused", contribute to this "prescriptive gap." First, on standard assumptions, there are often numerous plausible equilibrium concepts, each with many associated equilibria – and not a priori compelling way to choose amongst them. Second, even where one party wishes to act rationally, the other side may not behave as a strategically sophisticated, expected utility-maximizer – thus rendering conventional equilibrium analyses less applicable. A large and growing body of evidence – especially in "behavioral game theory" and experimental economics – suggests that people systematically and significantly violate the canons of rationality. Third, the elements, structures, and "rules" of many negotiating situations are not completely known to all the players, and even the character of what is known by one player may not be known by another. Such instances are quite likely to happen in RRR decision making where a variety of stake holders with contrasting interests are together.

2.2.7 RRR and Consensus Building. It can be deducted that RRR situations will require a consensus based decision that remains a challenging process. While the main emphasis will be on achieving consensus during discussions facilitated by various information eliciting techniques like Fuzzy sets, Hesitant Linguistic Fuzzy Term Sets (HFLTS), Preference Relations and so forth. While stake holders with different backgrounds and cultures are likely to have contrasting values, one cannot rule out the concurrent influences some stake holders will try to leverage over others to form like-minded groups and pursue the common interests of constituencies they represent. It is in these behind the scene exchanges and undeclared alliance formations that OR topics like Negotiation Analysis and Game Theory find their relevance and contribute to the overall process of the consensus reaching process.

The framework proposed by this research, highlights the relevance of keeping in mind the possible challenges that may be encountered during consensus building. A diverse group of stake holders, which is common in an RRR effort, will require people with diverse backgrounds to converge on a single agenda. HFLTS and preference relationships are preferred choices for this research, while negotiation analysis and game theory are also considered essential for a facilitator who intends to facilitate the entire process of developing mutually agreed value hierarchy from a diverse group of stake holders with varied interests. A diverse group of stake holders will have different interests and priorities. They are also likely to have different takes on the entire RRR process. The next step proposed in the research is to understand the values of stake holders and determine an appropriate method to capture these values for subsequent development of the model. The role of the analyst team is to use these approaches to support the facilitators and the ultimate decision makers.

2.3 Value Focused Thinking.

The research hinges on the term “values”, especially in a cultural perspective for the success of any RRR effort. The basic idea behind the term value focused thinking (VFT) is to be

proactive rather than reactive in critical decision making issues. In VFT, ***values*** should be the driving force behind decision making. Ralph Keeney believes that values are more fundamental to a decision problem than alternatives (Keeney 1992) . He advocates spending more time on understanding the values and understanding what is important and then using the values to create better alternatives than those already defined. In simple words, VFT consists of two activities: first decide what is important and then figuring out how to get it. Another approach to understanding VFT would be to compare it to alternative focused thinking as described by (Keeney R. 1992). In alternative focused thinking, the decision maker (DM) is following a reactive approach. Instead of simply choosing from the alternates available, VFT considers what is valued in the decision and if values exist that current alternatives do not address, develop alternatives to address the values. According to Keeney, VFT has three major ideas: start with values, use values to generate better alternatives, and use values to evaluate those alternatives. The values are the ideals that can be agreed upon through deliberation. In a military context, this is the Commander's intent, the ideal outcome desired of a particular decision situation (Parnell G.S 2007). VFT can be summarized as an approach where it is first determined what the values in relation to the decision are and what exactly would the DM like as an outcome. Normally, VFT deals with a single DM. In this research, the concept of VFT is being applied to a group of decision makers; where a consensus based value hierarchy will be constructed to determine the values important to all the stake holders for implementation of RRR. In order to understand the VFT process, it is pertinent to know some of the terminologies commonly used in the decision making process. The key terminologies used in VFT are listed in Table 3.

In military organizations such as the Air Force, value-focused thinking allows for defendable initiative selections. The fundamental objective, and select values comprising it, may be taken directly from existing policy documents (e.g., Air Force Doctrine, Instructions/ Orders). Using

existing policy documents is known as the “gold standard” (Jurk 2002) and yields the most defendable final decisions. They are normally called the Standard Operating Procedures (SOPs) or Air Force Orders (AFO) in Pakistan Air Force (PAF) to name an example. In our proposed research, owing to the diversity it may be difficult to find “gold standard” policy documents. The challenge is mitigated through the consensus process where the stake holders identify the mutually agreed values and subsequently develop a mutually agreed value hierarchy that represents their beliefs.

Key Terminologies in VFT

Fundamental Objective	"…an essential reason for interest in the decision situation" (Keeney, 1992:34). Also known as the "ends objective," it is the top block in the value hierarchy.
Value	What is important to the decision maker? The values are the decomposition of the fundamental objective. They are the building blocks of the value hierarchy (Keeney R., 1992).
Value Hierarchy	A pictorial representation of a value structure (consisting of the fundamental objective, the values, and the measures) (Kirkwood, 1997:12).
Local Weight	The amount of weight a set of lower-tier values or measures contributes to the value directly above it in the hierarchy (Shoviak, 2001:57).
Global Weight	The amount of weight each lower-tier value or measure contributes to the weight of the hierarchy's fundamental objective (Shoviak, 2001:57).
Measure	Analogous to the term "metric," it notes the "degree of attainment" of a value (Kirkwood, 1997:12).
Score	A "specific numerical rating for a particular alternative with respect to a specified measure" (Kirkwood, 1997:12).
Single dimensional value function (SDVF)	A specific, monotonically increasing or decreasing function for each measure used to convert an alternative's "score" on the x-axis to a "value" on the y-axis.
Alternative	"…the means to achieve the… values" (Keeney, 1992:3).

Table 3 Key Terminologies in VFT

2.4 Value Hierarchy

The value hierarchy serves the decision maker as a model for evaluating alternatives. It structures the organizational values, beginning with the fundamental value (e.g., the organization's reason for existing) and ending with the measures used during the evaluation process. Additionally, placing values in a hierarchy aids an organization in identifying whether any values are missing and, in doing so, specifies the type of value needed (Keeney, 1992:69). Keeney also emphasizes that since the value hierarchy is used by the organization to make decisions, it must be defendable. In other words, the hierarchy must be aligned with the organization's mission, particularly if the leadership has previously documented the fundamental objective (i.e., mission) of the organization.

2.5 Desirable properties of Value hierarchy.

"Completeness, non-redundancy, decomposability, operability, and small size" are five properties of value hierarchies identified by Kirkwood (1997:16-19).

Completeness. Completeness relates to the "collectively exhaustive" nature of each tier of a value hierarchy. In other words, all values in a single tier must include everything important to the "evaluation of the overall objective" (Kirkwood, 1997:16). Additionally, the evaluation measures must "adequately measure the degrees of attainment of their associated objectives" (Kirkwood, 1997:16). The property of Completeness assures that the alternatives are adequately evaluated and ranked accordingly.

Non-Redundancy. The principle of non-redundancy implies that the values of a single tier are considered "mutually exclusive." Non-redundancy is necessary to avoid duplication of scoring, the phenomena of a particular alternative receiving "more weight than was [originally] intended" (Kirkwood, 1997:17).

Decomposability. Decomposability is commonly referred to as independence. It means that the score an alternative receives for one evaluation measure should not influence its score in another measure. An example from Kirkwood illustrates this concept. Assume a value of "economic issues" with lower-tier values of "salary," "pension benefits," and "medical coverage." Note that for any one of these lower-tier values, the "value attached to variations in the score… depends on the levels of the other two lower-tier values." That is, if the "salary" were $500,000 a year, there would be limited value to slight increases in "pension benefits" and "medical coverage." Thus, the values are not independent (Kirkwood, 1997:17-18).

Operability. Operability is simply defined as user friendliness that a value hierarchy exhibits to the individual or organization. Since the value hierarchy facilitates communication and has potential to be used in defense of the selection of specific alternatives, it should be constructed as much as practical with the lay man in mind (Kirkwood, 1997:18).

Small Size. A small value hierarchy is more easily communicated and "requires fewer resources" to score the alternatives with respect to the evaluation measures (Kirkwood, 1997:18). A gauge to determine whether a value should be a part of a value hierarchy is known as the "test of importance." This test indicates, with respect to the final ranking of alternatives, that a value should be included in the value hierarchy if it could lead to a difference in the top ranked alternative (Kirkwood, 1997:18-19).

In order to highlight the vision and preferences of decision makers, the Value Hierarchy approach is therefore considered an appropriate choice in the context of RRR scenarios as well where decisions impact a large community. It is considered pertinent to revisit the salient aspects of represented group decision making.

2.6 Represented Group Decision Making. Decisions that impact a community or large populaces involve civil systems. Such decisions are usually not made by a single individual, but rather by groups of individuals. These may be legislative bodies such as the Congress or Parliament, the board of directors of a water district, a state or province legislature, or an international committee which is being explored as a possible choice by this research. In every case, each member of the group has their own view of the significance, importance, and relative value of the various objectives being considered. However, despite personal preferences, each representative has a constituency to whom he or she is responsible and represents. This means that the relative influence and views of the segments of this constituency must be integrated into the direct evaluation of the merits and demerits of the alternatives and options being considered. The important distinction for such decisions is that for such political decision processes there must always be a pre-existing definition of agreement for a decision. Hall and Haimes (Hall & Haimes, 1975) describe this as a consensus, i.e., no one objects to the proposal (although they might vote negatively if forced to vote). The idea of indifference bands is also proposed by Hall and Haimes where they believe that usually, a decision is defined by some minimum percentage majority vote. Consensus can only be achieved for those alternatives which fall within every member's indifference bands. A majority vote requires a corresponding percentage of members' indifference bands. If no such decision (or corresponding outcome) can be found, then there is a distinct possibility that no decision can be reached without a structural modification of the proposed course of action or the rule for defining a decision (Hall & Haimes, 1975).

2.6.1 Group Decision Making in a conflict ridden country. Group decision making, therefore, remains a challenging preposition in all its manifestation. In case of a conflict ridden country, the situation is even more challenging. In order to bring a sustainable and viable peace for such a country, all stake holders have to be taken on board to pursue the process of

consensus decision making. The stake holders are likely to represent contrasting backgrounds, ideologies and value preferences.

2.6.2 Hypothetical Core Committee. In order to explain the concept further, the case of pre-withdraw Afghanistan is considered to demonstrate the proposed process. The research proposes formulation of a hypothetical core committee that represents all stake holders, including both the international and domestic players. The committee is proposed to work under the auspices of an international agency such as the UN, EU, NATO or OIC. James Dobbins and his co-authors in a RAND report have argued that the UN provides the most suitable institutional framework for most nation-building missions, one with a comparatively low cost structure, a comparatively high success rate, and most importantly, the greatest degree of **international legitimacy** (Dobbins *et al, 2007*). Inclusion of all local stake holders on the basis of ethnic representation (local population) also ensures that the committee enjoys legitimacy and public approval from the local populace. The proposed core committee may be mandated to develop a consensus on a value hierarchy that affects the local population such as the entire Afghan populace. This core committee will thus form the hub of represented decision making and in order to reach an implementable agreement. Consensus agreement is viewed as a methodology that will be respected by all stake holders. The intricacies of achieving consensus supported by OR techniques will be highlighted in the subsequent paragraphs.

2.7 Envisaged Challenges for the Core Committee

The proposed core committee in any conflict ridden area is likely to face a variety of challenges, including diverse background, contrasting cultures, values, conflicting interests to name a few. These points are explored with the example of Afghanistan to further highlight the challenges.

2.7.1 Diverse background. The envisaged committee is likely to represent significant diversity amongst its members. Any country witnessing conflict is likely to involve a diverse

group of stake holders, both domestic and non-domestic (these could be occupying forces or peacekeeping forces as well). The example of pre-withdraw Afghanistan is used to illustrate the proposed concept. Considering all the stake holders in Afghanistan, the proposed committee comprises a variety of stake holders ranging from the US, EU, NATO as well as the local Afghan Government, Taliban and a host of significant war lords controlling various areas under their influence. If a core committee was to be formed to reach consensus, members from the developed world like the USA, the EU and the representatives from the UN are likely to have excellent educational backgrounds and substantial experience in their area of expertise. By contrast, representation from the Afghan populace is likely to compose of at least some people who may only have limited education in sharia (Islamic law). A similar real life example is Mullah Abdul Ghani Baradar, who signed the peace agreement with Washington on February 29, 2020 paving the way for the intra-Afghan negotiations and a withdrawal of US troops from Afghanistan, and currently holds the post as head of the Taliban's political office in Qatar. Mullah Baradar has been running a madrassah[13] along with the founder of Taliban movement Mullah Umar prior to the formation of The Taliban government with no formal education in science or a humanitarian faculty except religion, much like some self-taught fundamentalist ministers. Similar educational backgrounds are likely to be boasted by major members from the Afghani side. However, even core committee members with less formal traditional western education are likely to have educated individuals as aides. This is especially likely for the members representing the Afghan notional government.

2.7.2 Contrasting cultures and values based on cultures. Conflict ridden countries witness contrasting cultures between the aggressors and the local populace. The phenomenon is even

[13] [13] https://web.archive.org/web/20100221061339/http://www.newsweek.com/id/208637/page/2 accessed 05 Oct,2020

more pronounced when the occupying forces are from another belief system and ideology. Tamil Tigers in Sri Lanka, Arabs and Israel and warring factions in Somalia are such examples where the stake holders exhibit diverse and contrasting culture and values. The culture in Afghanistan is based on the principles of Islamic sharia and Pashtunwali. Pashtunwali is the code of conduct that every Pashtun is expected to follow and dates back to pre-Islamic era in the region. Thomas Johnson and Chris Mason in their book "No sign until the burst of fire" highlight that

"Pashtunwali is neither the absence of governance, nor summary judgment, nor a lynch mob at work. Rather, it is an alternative form of social organization with an advanced conflict resolution mechanism that does not involve courthouses, jails, lawyers, law schools, bailiffs, county clerks, prisons, prison guards, judges, or policemen. It has been estimated that jirgas resolve 95 percent of the cases in which they are invoked[14]. Perhaps most important for U.S. security interests in the region, the millions of tribesmen who live within this system have no desire to have a new, alien system imposed on them by outsiders. Furthermore, Pashtuns are generally convinced that their system of social order produces men superior to those of the Western model. While justice and responsibility are collective, however, at the individual level, Pashtunwali encompasses four central personal values: freedom, honor, revenge, and chivalry". (Johnson & Chris, 2008 P 61)

It is important to keep in mind that understanding Pashtunwali does not offer a map to control Pashtun tribes. It does, however, help to understand the Pashtun culture and indirectly Afghan culture. Once understood, the framework can help in formulating a strategy for engaging with the proposed Afghan committee members in a more beneficial manner that will help in achieving the fundamental objective of the research.

2.7.3 Contrasting to conflicting Interests and objectives. Similarly, interests and objectives naturally vary for all stake holders embroiled in a conflict. The US State Department in its July 2019 statement on the subject highlights that Afghanistan remains an important partner of the United States in the fight against terrorism, working to eliminate al-Qaeda, ISIS-Khorasan

[14] Carl Robichaud, "Afghanistan's Three Legal Systems," Afghanistan Watch, January 9, 2007, http://www.afghanistanwatch.org/rule_of_law/index.html.

(ISIS-K) and their affiliates in Afghanistan. In order to strengthen Afghanistan's capabilities as a partner, and to improve the lives of the Afghan people, we (USA) continue to invest U.S. resources to help Afghanistan improve its security, governance, institutions and economy.

2.7.4 RRR and Wicked Problems. However, recently Afghanistan has again been the center of the Great Power Games where all the global powers like the United States, China and Russia have tried to attain influence in Afghanistan which is considered the doorway to energy and mineral rich Central Asia. The point to emphasize is the contrasting objectives that have been held by international players when it comes to Afghanistan. For the purpose of this research, it is assumed that all players desire a sustainable peace and development in Afghanistan, although they may currently define such differently, underlying the need for consensus building. It is also a good indication that our research problem is a multi-objective problem and perhaps compensatory in nature. It cannot be assured that everything will be achieved at the most desirable level. That is, negotiation and compromises will certainly be necessary. The compromises by stake holders will become the point of a negotiation analysis. On a similar note, although treating this problem as a multi-objective problem is not the only solution and may not be the optimal solution for the problem, it certainly remains a worthwhile alternative to be considered. Churchman has suggested Rittel termed these as "wicked problems" where:

"Wicked problems" refer to that class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing. (C. West Churchman, "Wicked Problems" Management Science, VoL 14, No. 4, December, 1967, p. B-141)

Rittel & Weber expand on this problem class in a 1973 article in *Policy Sciences* (Rittel & Webber, 1973). They point out that while engineers and scientists think in terms of precise, optimal solutions, social problems are often messy.

The kinds of problems that planners deal with—societal problems—are inherently different from the problems that scientists and perhaps some classes of engineers deal with. Planning problems are inherently wicked. As distinguished from problems in the natural sciences, which are definable and separable and may have solutions that are findable, the problems of governmental planning—and especially those of social or policy planning—are ill-defined; and they rely upon elusive political judgment for resolution. (Not "solution." Social problems are never solved. At best they are only re-solved—over and over again.) (Rittel & Weber, p.160)

Military planning is inherently a series of "wicked problems" as is discussed in *NATO Guide for Judgement-Based Operational Analysis in Defence Decision Making*, TR-SAS-087, among other references.

2.7 Hybrid, Information Warfare. The United States had been directly engaged in the Afghan conflict for nearly two decades. From the outset, U.S. leaders recognized the importance of winning the support of the Afghan population, given the country's history of antipathy toward foreign armies. Initial efforts to influence the population met with some success, but ensuing years have seen rising disenchantment with the Hamid Karzai and Ashraf Ghani administrations and coalition forces. A 2012 report by National Defense Research Institute and authored by Arturo Munoz on Psychological Operations (PSYOP) (later termed Military Information Support Operations (MISO)) highlights partial successes in the achievement of overall objectives regarding PSYOP in Afghanistan from 2001-2010. The various themes assessed are highlighted in Table 4.

Once GEN Stanley A. McChrystal assumed command of the International Security Assistance Force (ISAF) in July 2009, guerrilla warfare in Afghanistan was on the rise. Simultaneously, public-opinion polls showed a drastic decline in the image of the Afghan government, as well as U.S. and coalition military forces. General McChrystal undertook a thorough review of the situation and concluded,

> "*We need to understand the people and see things through their eyes. It is their fears, frustrations, and expectations that we must address. We will not win simply by killing insurgents. We will help the Afghan people by securing them, by protecting them from*

intimidation, violence, and abuse, and by operating in a way that respects their culture and religion. This means that we must change the way we think, act, and operate[15]*."*

Major Themes in Psychological Operations 2001-2010

Theme	Assessment		
	Effective	**Mixed**	**Ineffective**
The war on terror justifies U S intervention			Ineffective
Coalition forces bring peace and progress	2001-2005	2006-2010	
Monetary rewards offered for capture of Al Qaeda and Taliban leadership			Ineffective
Al Qaeda and Taliban are enemies of Afghan people		Mixed	
Monetary rewards for turning in weapons		Mixed	
Support of locals needed to eliminate IEDs		Mixed	
US forces have overwhelming technological superiority over Taliban	2001-2005	2006-2010	
Democracy benefits Afghanistan and all Afghans need to participate in elections	2001-2005	2006-2010	Ineffective finally

Table 4 Major Themes in Psychological Operations 2001-2010 *(Munoz 2012, xvii)*

Thus public perception and public image building along with the ownership of the reconstruction operation in ***any*** conflict ridden country will be a great challenge that will be critical to the success of fundamental objective of establishing sustainable and viable peace as witnessed by the US in Afghanistan.

It is considered pertinent to present broad contours of the amalgamation of techniques used in Operations Research and RRR for more clarity. Figure 7 highlights the broad contours and highlights the OR techniques used while developing, implementing and conducting dynamic analysis of consensus based value hierarchy.

[15] https://www.economist.com/democracy-in-america/2009/08/27/is-general-mcchrystal-a-hippie accessed 20 Oct,2020

Contours of Amalgamation of Operations Research Techniques and RRR

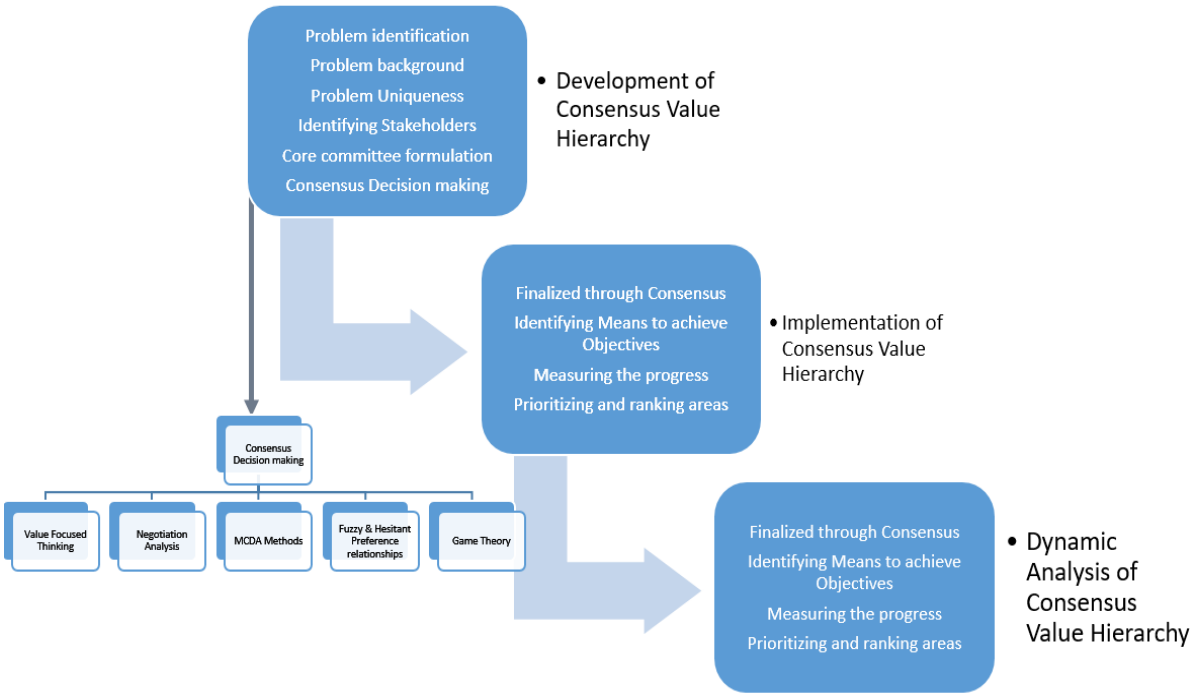

Figure 7 Amalgamation of Operations Research Techniques and RRR

2.10 Challenges of Group Decision Making. Involving more people in the decision-making process can greatly improve the quality of decisions and outcomes. However, involving more people can also increase conflict and generate other challenges (Black J 2019). Group decision making has always been a challenging task, especially when the decision makers (DMs) are people representing different skill levels and different specialties. Eliciting preferences and meaningful information that can be used for mathematical modeling can be an arduous task from a single decision maker; collecting meaningful information without any distortion from a group of people is even more challenging (Cabrerizo, *et al*. 2019). The proposed core committee in this research is a valid example of a diverse group where members from different cultures, values and varied educational background are engaged to reach a consensus decision affecting the populace of conflict ridden country.

When dealing with properly anchored specific numerical values, it is relatively easier to infer information from DMs and then use it in a mathematical model or program. However, when

dealing with problems of social development, abstract in nature and involving human lives, it is difficult to assign a numerical value in terms of value preference (H.Bandemer and S.Gottwald 1996). In such cases, DMs are beginning to adapt linguistic information which is more flexible and easy to express for DMs but relatively more difficult for the analyst to convert to useful mathematical notation for Decision Analysis (Manoj Kumar 2015). The latest research in the field of Fuzzy and Linguistic sets is considered well suited for our research question. Thus, it is appropriate to revisit few basics on Fuzzy sets and Linguistic variables.

2.10 Group Decision Making with Hesitant Fuzzy Linguistic Preference Relations

2.10.1 Fuzzy Sets. The idea of fuzzy sets dates back to 1964. The late Lofti A. Zadeh once believed that all real-world problems could be solved with efficient, analytical methods and/or fast electronic computer. In the early 1960's, he began to feel that traditional system analysis techniques demanded too precise values for many complex real-world problems and presented "Fuzzy Set Theory". The concept of fuzzy sets, when first introduced, encountered sharp criticism from the academic community, since in contrast to precise mathematical numbers to identify set membership, it was dealing with members that did not have clearly defined class of membership (Zadeh 1965).In the case of classic sets, also called *crisp sets*, a given object **x** may belong to a set A (a member of a set A), or not belong to this set (not be a member of set A), and these two options are denoted by $\mathbf{x} \in A$ or $\mathbf{x} \notin A$. A classic set may be described by means of the characteristic function (χA) that takes two values: 1 (for the object belonging to a set A), and 0 (for the object not belonging to a set A). Unlike a classic set, in the case of a fuzzy set A, an object x may belong to this set with varying membership degrees in the range [0, 1], where 0 and 1 denote, respectively, lack of membership and full membership. The degree of belongingness is called the membership function and ranges from 0 to 1 (Jewezski, Czabanski and Leski 2017). The membership function measures the degree to which an object

x is a member of a particular set. Unlike probability theory, degrees of membership are not required to add up to 1 across all objects, so many or few objects in the set could have high membership. However, an object's membership in a set and the set's complement must still sum to 1. The main difference between classical set theory and fuzzy set theory is that the latter admits to partial set membership. A classical or crisp set, then, is a fuzzy set that restricts its membership values to {0, 1}, the endpoints of the unit interval. Fuzzy set theory models vague phenomena by assigning any object a weight given by the value of the membership function, measuring the extent to the object belongs to a particular set.

The formal (i.e., mathematical) definition of a membership function as given by Zadeh (Zadeh 1965) states that a fuzzy (sub)set, say F , has a membership function μ_F defined as a function from a well-defined universe (the referential set), X, into the unit interval as: $\mu_F : X \longrightarrow [0,1]$, this is depicted in Figure 8.

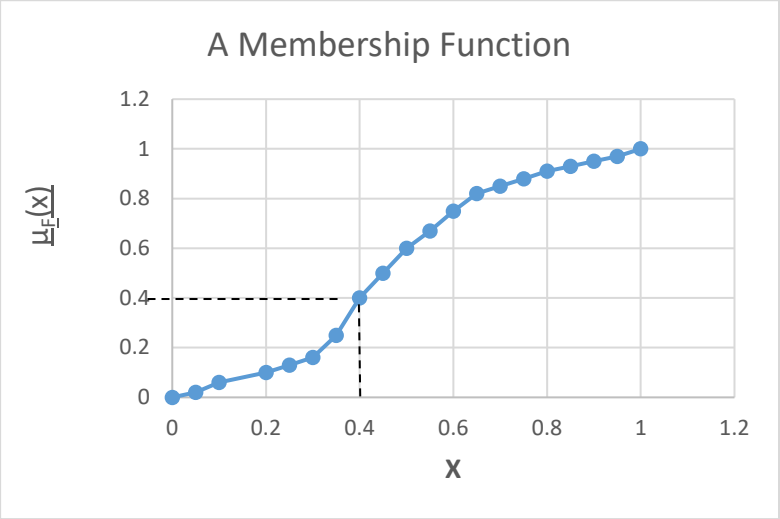

Figure 8 A Membership Function (adapted *(Bilgic 2000)*

Zadeh while defining linguistic variable states that linguistic variable are those whose values are words or sentences in a natural or artificial language (Zadeh, 1975). If you refer to Age in terms of young, very young, old rather than the number of years since birth (17, 24, 56, 75) it becomes a linguistic variable. There are various views on the membership function, for

example, Sam (x) is young (y) is represented by a number in unit interval, $\mu_Y(x) = 0.7$. This statement can be viewed in five different manners. These are:-

Likelihood View: 70% of the given population believes Sam is young.

Random Set view: 70% of the given population described "young" as an interval in which Sam's age falls.

Similarity View: Sam's age varies away by 0.3 from a prototypical age which is truly "young".

Utility View: 0.7 is the utility of asserting that Sam is young.

Measurement View: Sam is younger than some when compared and this fact can be measured as 0.7 on some predefined scale.

2.10.2 Graded Membership Function. While discussing fuzzy set theory, the concept of graded membership sounds fairly intuitive since this is just an extension of a well-known concept: membership in a set to "graded membership" in a set. However, the real question remains, "How can graded membership be measured?" Although more than two thousand years ago, Aristotle commented on an "indeterminate truth value", the interest in formal aspects of many-valued logics has started in early 1900's (S Ajdukiewicz 1967). However, the meaning of multiple truth values has not been fully explained to a satisfactory level. While analyzing fuzzy sets, the following questions require deliberation:

1. What does graded membership mean?

2. How is it measured?

3. What operations are meaningful to perform on it?

Taner Biljic believes that mainly there has been two trends in the interpretations of fuzziness: those who think that fuzziness is subjective as opposed to objective and those who think that fuzziness stems from the individual, as opposed to from a group of people (or sensors, *etc*.) (Bilgic, Measurement-Theoretic Frameworks for Fuzzy Set Theory with Applications to Preference Modelling 1995).

Ellen Hisdal (Hisdal 1996) advocates a likelihood view of the concept of a grade of membership. Her TEE (Threshold, Error, assumption of Equivalence) model for membership functions considers several sources of fuzziness. These are errors in measurement, incomplete information and interpersonal contradictions, all of these are likely to surface in our research question. The three methods proposed by Hisdal to elicit the membership function are:

1. Label experiment: Sam is young where young ∈ {very young, young, old}.
2. Yes-No experiment: Is Sam young?
3. Grade of membership experiment: What is the degree of Sam belonging to the set of young people?

The use of fuzzy numbers based linguistic models has increased in recent years to solve problems regarding decision making as stated by Song and Li (Song and Li, A Mathematical programming approach to manage group decision making with incomplete Hesitant Fuzzy Linguistic Preference Relations 2019).

2.10.3 Hesitant Fuzzy Sets. Hesitant fuzzy set is an extension of fuzzy sets; for example, two decision makers discuss the membership degree of an element to a set, and one wants to assign 0.6, but the other 0.8. Accordingly, the difficulty of establishing a common membership degree is not because there is a margin of error, or some possibility distribution values, but because it has a set of possible values. To deal with such cases, Torra and Narukawa (Torra & Narukawa, 2009) introduced the concept of Hesitant Fuzzy Sets (HFS). HFS permits the membership

having a set of possible values. Torra and Narukawa (Torra & Narukawa, 2009) and Torra (Torra V. , 2010) discussed the relationship between the HFS and three other kinds of fuzzy sets, and showed that the envelope of HFS is an intuitionistic fuzzy set which assigns both membership and non-membership degree. They also proved that the proposed operations are consistent with the other types of fuzzy sets when applied to the envelopes of hesitant fuzzy sets. HFS can be applied in many decision making problems.

2.10.4 Hesitant, Fuzzy and Linguistic Preference Relations. Hesitant, fuzzy and linguistic preference relations that are also not complete is definitely a challenging task. Song & Li have fused the techniques of various scholars who worked on fuzzy sets, hesitant preference values, and linguistic variables to form an incomplete Hesitant Fuzzy Linguistic Preference Relation (HFLPS) or Hesitant Fuzzy Linguistic Term Set (HFLTS). Mathematical modeling has been used to complete the incomplete set using techniques from dynamic programming to complete the incomplete set. Subsequently, the complete set has been used to rank available alternatives following multi criteria decision making models. To fully understand the extent of challenge for the problem at hand, it is prudent to discuss the terms mentioned earlier.

2.10.5 Fuzzy Sets and Fuzzy Logic. Fuzzy Logic (FL) is a multivalued logic that allows intermediate values to be defined between conventional evaluations like true/false, yes/no, high/low, and so forth (Zadeh 1965). Interestingly, the concept of fuzzy sets encountered sharp criticism from the academic community. Some rejected it because of the name without knowing the content in detail and others rejected because of the theory's emphasis on imprecision (Manoj Kumar 2015). The logical question "why fuzzy sets?" arises and is answered by Bandemer and Gottwald (Bandemer & Gottwald 1995) in their referenced text book. They state that in real life mathematical modelling there are usually some idealizations necessary to transform problems from their intuitive basis into a mathematised form. Such data is available for the "crisp sets". However, in many modeling situations, one does not directly

meet sets with a crisp “borderline”, but rather quite often there exists something like a gradual transition between membership and non-membership. It is for such cases that the idea of “fuzzy sets” is conceived and developed (Zadeh, The Concept of Linguistic Variable and its Application to Approximate Reasoning-I, 1975).

2.10.6 Linguistic Variable. Zadeh suggests a linguistic variable is characterized by a quintuple *(H,T(H),U,G,M)* in which *H* is the name of the variable; *T(H)* (or simply *T*) denotes the term set of *H*, i.e., the set of names of linguistic values of *H*, with each value being a fuzzy variable that is denoted generically by *X* and ranging across a universe of discourse *U*, which is associated with the base variable *u*. *G* is a syntactic rule (which usually takes the form of a grammar) for the generation of the names of values of *H*; and *M* is a semantic rule for associating its meaning with each *H, M(X*), which is a fuzzy subset of *U* (Zadeh, The Concept of Linguistic Variable and its Application to Approximate Reasoning-I, 1975). Figure 9 is a pictorial depiction of Linguistic variable with semantics (Herrera *et al*, 2012). A mathematical value can be assigned to a grammatical sentence based on Figure 9 (“Nothing” can be graded as 0, whereas “Very Low” lies from 0.01 to 0.17) . Subsequently a linguistic set needs to be defined either with “An ordered structure approach” or with “A context free grammar”.

Herrera, Zadeh and Song & Li describe the ordered structure approach where linguistic term set is defined by means of an ascending ordered structure. For example,

$S = \{s_0 : \text{nothing}, s_1 : \text{very low}, s_2 : \text{low}, s_3 : \text{medium } s_4 : \text{high}, s_5 : \text{very high}, s_6 : \text{perfect}\}$.

The necessary conditions to be met are: A negation operator $\text{Neg}(s_i) = s_j$ where $j = g - i$ ($g + 1$ is the granularity of the term set). A maximization operator:

$\text{Max}(s_i, s_j) = s_i$ if $s_i \geq s_j$ and a minimization operator: $\text{Min}(s_i, s_j) = s_i$ if $s_i \leq s_j$.

A context free grammar approach defines a linguistic set by means of context free grammar G so that the linguistic terms are sentences generated by G as described by Bordogna & Pasi (Bordogna and Pasi 1993).

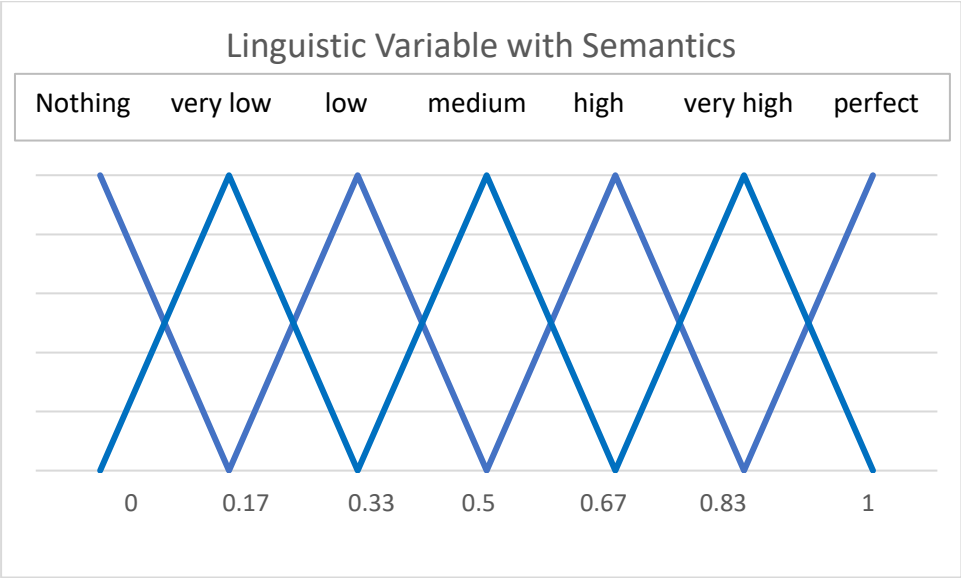

Figure 9 Set of linguistic variables with semantics (adapted Herrera et al, 2012)

A grammar G is a 4-tuple (V_N, V_T, I, P), where V_N is the set of nonterminal symbols, V_T is the set of terminal symbols, I is the starting symbol, and P is the production rules that are defined in an extended Backus–Naur form, which is a meta syntax notation for context free grammar, often used to describe syntax of languages in computing (Bordogna and Pasi 1993). Among the terminal symbols of G, one can find primary terms (e.g., low, medium, high), hedges (e.g., not, much, very), relations (e.g., lower than, higher than), conjunctions (e.g., and, but), and disjunctions (e.g., or).

Thus, choosing I as any nonterminal symbol and using P can generate linguistic expressions, such as, {lower than medium, greater than high,...} which is considered easier to express and interpret in a diverse group of decision makers as highlighted in this research.

2.10.7 Hesitant Fuzzy Sets (HFS). Torra and Narukawa define a HFS as:

Let X be a fixed set, a hesitant fuzzy set (HFS) on X is in terms of a function that when applied to X returns a subset of [0,1] (Torra & Narukawa, 2009). Similarly Zhu and Xia (Zhu *et al*, 2012) expressed the HFS by a mathematical symbol:

$$A= \{x, h_A(x) > x \mid x \in X\}$$

where $h_A(x)$ is a set of some values in [0,1], denoting the possible membership degrees of the element $x \in X$ to the set A. Zhu and Xia term $h = h_A(x)$ a hesitant fuzzy element (HFE) and Θ the set of all HFEs.

Chen *et al.* (Chen *et al*, 2013) explain the concept with an example, where $X = \{x_1, x_2, x_3\}$ be a fixed set.

$h_A(x_1) = \{0.2,0.4,0.5\}$, $h_A(x_2) = \{0.3,0.4\}$ $h_A(x_3) = \{0.3,0.2,0.5,0.6\}$

are the HFEs of x_i where $i = (1,2,3)$ to a set A. A then can be considered as an HFS

$$A = \{ < x_1, \{0.2,0.4,0.5\} >, < x_2 , \{0.3,0.4\} >, < x_3, \{0.3,0.2,0.5,0.6\} > \}$$

There are also some special HFEs (Torra V. , 2010).

(a) Empty set: $h = \{0\}$, which is also denoted as O^*.

(b) Full set: $h = \{1\}$, denoted as I^*.

(c) Complete ignorance (all are possible) $h = [0,1]$ denoted as U^*

(d) Nonsense set $h = \Theta^*$

Liao and Xu (Liao and Xu 2013) made some clarifications on these special HFEs from the viewpoint of the definition of HFS and also from the practical decision making processes: It is reiterated that HFS on the fixed set **X** is in terms of a function **h** that when applied to X returns a subset of [0,1]. Hence, if **h** returns no value, it is adequate to assert that h is a nonsense set.

If it returns the set [0,1], which means all values between 0 and 1 are possible, it is a complete ignorance set. If it returns only one value y Ɛ [0,1] , which is a subset of [0,1], i.e., we can take y as [y, y]. When y = 0, which means the membership degree is zero, it is termed an empty set; however if g = 1, then this is the full set. Note that we should not take the empty set as the set that there is not any value in it. The difference between HFS and traditional set is that the empty set in the case of HFS is not empty; its membership function is 0 and similarly full set means that membership function is 1 and not all the possible values as in case of traditional sets. To elaborate, consider a case where several DMs evaluate a possible alternative by employing HFEs. The empty set depicts that all DMs oppose the alternative. The full set means that all DMs agree with it. The complete ignorance represents that all DMs have no knowledge of the alternative, and the nonsense set implies irrelevance (Xu p 15, 2014). The HFS can be ranked when compared based on their scores, deviation degree which is quite similar to standard deviation. The mathematical operations on HFS and their application will be discussed in subsequent paragraphs.

2.10.8 Preference Relation

The first principle of rational choice theory is that there is a choice set **X** of options to choose from. Albouy points out that the choice set **X** need not include just a person's own consumption, but preferences over any state of the world (Albouy, 2002). He highlights his point with the following example,

x = (Pete gets 1 dollar, Bill gets 3 kiwis , the President of France lives in a blue house)

y = (Pete gets 1 dollar, Bill gets 4 kiwis , the President of France lives in a blue house)

z = (Pete gets 1 dollar, Bill gets 4 kiwis , the President of France lives in a red house)

The size of a choice set, say m, can be extremely large.

A preference relation is a subset of **X** × **X**, which satisfies the following two rationality properties[16] (Obara 2012).

> **Completeness** ∀x ∈ X and ∀y ∈ X either x < y or y < x. This means that it is always possible to say whether or not one would prefer one choice to another.
>
> **Transitivity** ∀x ∈ X, ∀y ∈ X, and ∀z ∈ X if x < y and y < z then x < z, i.e. (x, y) ∈ < and (y, z) ∈< ⇒ (x, z) ∈ <. The implication of transitivity is that it permits ordering of choices from best to worst, allowing for ties.

2.10.9 VIKOR Method

A foundation for a compromise solution was established by Yu (Yu 1973) and Zelany (Zelany 1974) and later advocated by Opricovic and Tzeng (Opricovic and Tzeng 2004). The VIKOR method was introduced as an applicable technique to implement within Multi Criteria Decision Making (MCDM) by Opricovic in 1980. It focuses on ranking and selecting from a set of alternatives in the presence of conflicting criteria. The compromise solution is a feasible solution that is the closest to the ideal solution, where a compromise means an agreement established by mutual concession also called consensus. The method possesses two significant advantages; the first that it provides a maximum group utility of the majority and a minimum of the individual regret of the opponent (Opricovic and Tzeng 2004). The method contains four steps where **n** and **m** are the number of criteria and alternatives, respectively. Step 1 and 2 finds utility measure and regret measure for alternatives regarding each criterion. Step 3 computes the minimum and maximum amounts of the step 2 results. The calculation of Qj as the majority agreement in step 4 prioritizes the alternatives (Yezdani & Graeml, 2014). The method as highlighted by Opricovic (S. Opricovic 1998) is briefly explained in following lines.

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[16] http://www.econ.ucla.edu/iobara/LecturePreferenceandUtility201A.pdf accessed 15 Apr,2022

Step 1:

The first step is to calculate x_i^* and x_i^- **where**

$$x_i^* = [\max(x_{ij}) \mid j = 1,2,3,\ldots,m] \quad (1)$$

$$x_i^- = [\min(x_{ij}) \mid j = 1,2,3,\ldots,m] \quad (2)$$

where x_{ij} is the value of ith criterion function for the alternative x_i.

Step 2:

Calculate the value of S_j and R_j

$$\text{where } S_j = \sum_1^n w_i \frac{x_i^* - x_{ij}}{x_i^* - x_i^-} \quad (3)$$

$$R_j = \max\left(w_i \frac{x_i^* - x_{ij}}{x_i^- - x_{ij}}\right) \quad (4)$$

and where S_j and R_j represent the utility measure and regret measure for alternative x_j and w_i is the weight of each criterion (S. Opricovic 1998).

Step 3:

Compute the values of **S*** and **R***

$$\text{where } S^* = \min(S_j) \text{ and } S^- = \min(S_j) \quad j = 1,2,3,..,m \quad (5)$$

$$R^* = \min(R_j) \text{ and } R^- = \min(R_j) \quad j = 1,2,3,..,m \quad (6)$$

Step 4:

Determine the value for Q_j for (j=1,2,…,m) and rank the alternatives based on Q_j.

$$Q_j = V\left(\frac{s_j - s^*}{s^- - s^*}\right) + (1 - v)\left(\frac{R_j - R^*}{R^- - R^*}\right) \quad (7)$$

Where v is the weight for the strategy of maximum group utility and (1-v) is the weight of individual regret. When v > 0.5, the index of $\mathbf{Q_j}$ will indicate majority agreement and vice versa (S. Opricovic 1998). This compromise solution is stable within a decision making process, which could be: "voting by majority rule" (when v > 0.5 is needed), or "by consensus" (v ≈ 0.5), or "with vote" (v < 0.5). Here, v is the weight of the decision making strategy "the majority of criteria" (or "the maximum group utility"). Normally this method used a maximum group utility value of 0.5 and a set of compromise solutions is proposed if any condition is not satisfied (Radhika, Kumar and Swapna 2013). For this reason, different generalizations and extensions of fuzzy sets have been introduced. Song & Li (Song and Li, A Mathematical programming approach to manage group decision making with incomplete Hesitant Fuzzy Linguistic Preference Relations 2019) have incorporated a similar Group Consensus Index of 0.75 in their research. An index of 0.75 is considered to be quite high for this research scenario. This index is flexible and can be set to any limit by the stake holders involved that is appropriate for their decision(s). For the purpose of this research, we propose an index of 0.66 which is assumed to be selected by the overall responsible organization for the entire project. In this research, the UN remains the deciding / refereeing organization in the illustrative example. Of course, a different specific setting may dictate a different consensus index may be required.

2.10.10 Hesitant Fuzzy Linguistic Term Set. Herrera *et al* (Herrea, Rodriguez and Martinez 2012) state that in many situations, uncertainty is not probabilistic in nature but, rather, imprecise or vague. Hence, other models, such as fuzzy logic and fuzzy sets theory, have been successfully applied to handle imperfect, vague, and imprecise information (Chen, *et al*. 2017). Nevertheless, to handle vague and imprecise information whereby two or more sources of vagueness appear simultaneously, the modeling tools of ordinary fuzzy sets are limited. In real life problems, it may occur that experts hesitate among several values to assess a linguistic variable. The fuzzy linguistic approach is, however, aimed at statically assessing

single linguistic terms for the linguistic variables. Hence, Herrera *et al* point out that it is clear that, when experts hesitate about several values for a linguistic variable, the fuzzy linguistic approach is limited (Herrera, *et al*. 2007). The linguistic variables fail in hesitant situations and that is where the utility of Hesitant Fuzzy Linguistic Term Set (HFLTS) is realized. The next few lines discuss the concept and permissible operations on HFLTS as proposed by Herrera *et al* and supported by Song & Li (Song and Li, A Mathematical programming approach to manage group decision making with incomplete Hesitant Fuzzy Linguistic Preference Relations 2019).

Let S be a linguistic term set, $S = \{s_0 ,...,s_g \}$, an HFLTS, H_S , is an ordered finite subset of the consecutive linguistic terms of S. The empty HFLTS and the full HFLTS for a linguistic variable ϑ as follows.

Empty HFLTS: $HS(\vartheta) = \{ \}$,

Full HFLTS: $HS(\vartheta) = S$.

Any other HFLTS is formed with at least one linguistic term in S.

Example 1: Let S be a linguistic term set,

$S = \{s_0 : \text{nothing}, s_1 : \text{very low}, s_2 : \text{low}, s_3 : \text{medium } s_4 : \text{high}, s_5 : \text{very high}, s_6 : \text{perfect}\}$,

a different HFLTS might be $HS(\vartheta) = \{s_1 : \text{very low}, s_2 : \text{low}, s_3 : \text{medium}\}$

$HS(\vartheta) = \{s_3 : \text{medium}, s_4 : \text{high}, s_5 : \text{very high } s_6 : \text{perfect}\}$. The computations and operations that can be performed on HFLTS are that; union and intersection between 2 HFLTS will be another HFLTS. To compare two HFLTS, the concept of an envelope is used by Herrera *et al*, where the envelop of an HFLTS is a linguistic interval whose limits are obtained by means of upper bound (max) and lower bound (min). To illustrate, let S = {nothing, very low, low, medium, high, very high, perfect} be a linguistic term set and Hs = {high, very high, perfect}

be an HFLTS of S, its envelop is env(Hs)= [high, perfect] .The HFLTS possess commutativity, associativity and distributive properties as well (Song and Li, A Mathematical programming approach to manage group decision making with incomplete Hesitant Fuzzy Linguistic Preference Relations 2019).

2.10.10.1 Strengths of HFLTS. The idea of using hesitant fuzzy sets, which allows DMs to simultaneously consider several hesitant values in order to produce an overall assessment value as proposed by Torra (V. Torra 2010), Herrera *et al* (Herrera *et al,* 2012) that was propagated by Zadeh (Zadeh, The Concept of Linguistic Variable and its Application to Approximate Reasoning-I, 1975) (Zadeh, Fuzzy Sets, 1965) has been the scope of recent research, especially in China. The original idea that has been further developed by Song & Li is a valid application in group decision making (GDM) problems. This is evident by the use of this technique by a number of researchers like Cheng & Hong 2014, Dong, Li and Herrera 2016 and several other researchers. Some of the interest may be attributed to the recent exponential growth in the interest in information sciences.

The concept of hesitant fuzzy linguistic term set (HFLTS) is a relatively new technique that has modelled problems involving multi criteria decision making (MCDM) and has been claimed as a successful technique to model MCDM problems especially with the VIKOR method (Liao *et al,* 2015).

Song & Li have demonstrated that the proposed methodology enables DMs with various specialty backgrounds and experience levels to reach consensus and jointly develop ranking of alternatives. The weighting technique is considered easy to implement and assumes a common goal consensus amongst all stake holders can be achieved. The proposed methodology incorporates completing an incomplete HFLPR

while retaining consistency in order to prevent distortion of expert's information. The highlight is using hesitant preference relations, completing them even if they are incomplete (at least one entry in every row and every column) (Song & Li, 2019) and obtaining a numerical value after transforming the hesitant preference relationships. Song & Li maintain the regression method used to mathematically complete an incomplete HFLPR is stable, easy to apply and can be solved on any available computing machine. Overall, it is an effective use of developing unknowns from known parameters based on the DMs expert opinion. The linguistic variables and the hesitant preference values are then transformed into a single mathematical value which can be further calculated to rank available alternatives.

2.10.10.2 Benefit of HFLTS in RRR. In a RRR scenario for a conflict ridden country, the stake holders are diverse. The DMs represent various backgrounds both culturally and academically. A relevant example will be a group of decision makers (core committee) for RRR in pre-withdraw Afghanistan. While the members representing the US, EU, UN and OIC are likely to adept with scientific and mathematical techniques, the same cannot be assumed of some local stake holders who may have limited or no formal education. Thus, a hesitancy while expressing preference relationships is a likely possibility. It is therefore proposed that employing the concept of HFLTS by the support analysis team may be an appropriate idea to capture the values of DMs which can then be transformed into mathematical numbers for further development of the solution.

2.10.10.3 Weaknesses. Concurrently, applying HFLTS to solve problems in a time sensitive environment as claimed by Song & Li may not be a sound approach. In fact, given a diverse team of decision makers, eliciting linguistic preference relationships that accompany hesitancy between choices, can be extremely difficult to execute. The

task becomes more complex when actual lives are involved and the delay is likely to reduce the probability of their survival contrary to the claims of Song & Li (Song & Li, 2019), although they were focused on an emergency case in a common authoritarian culture. Such examples, if at all, have to be preliminarily calculated and analyzed beforehand in order to save precious moments that could be lost in reaching a consensus decision. It does suggest, however, a clear statement and definition of terms will be necessary.

2.10.10.4 Difficulty in Weight Allocation. The weighting methodology, based on the DMs and SMEs specialties and experience is difficult to implement. It may be difficult to decide the agreed upon weights, especially if the DMs are deciding a problem impacting national or regional social fabric. A likely example could be trying to rescue hostages at an airport held captive by terrorists. The DM representing the government is likely to have more weight compared to a Special Forces member with regard to a policy issue. Thus, the agreement on the weights has to be done prior to addressing such a sensitive problem with time constraints. This remains a challenge area and requires further in depth study.

2.10.10.5 Consistency of DMs. Researchers on the subject cite the role of facilitator for reaching a consensus. They also state that the facilitator needs to supervise and may encourage DMs to adjust their preferences for attaining a Group Consensus Index (GCI) higher than the decided threshold. The entire process is based on extracting an HFLPR which is multiplicative consistent, whereas the Song & Li themselves admit that in real life problems (Song & Li, 2019), this consistency is difficult to achieve and instead soft consistency is typically achieved. Similarly, Song & Li mention the Group Consensus Index (GCI) to be set at a pre-determined value, which in their example is set to be at 0.75. The linguistic preferences and HFLPRs are

reviewed time and again till a value of 0.75 is achieved on GCI for an individual DM. Every decision maker has to reach at least this consensus level before the iterations for the algorithm can stop. This could be a limiting factor in a time constrained environment. Consensus decision making involving diverse stake holders remain a very broad challenge in real life, especially in a conflict ridden country as proposed by this research.

2.10.10.6 The Von Neumann-Morgenstern Utility Theorem and Group Decision Making. The von Neumann-Morgenstern utility theorem presented in 1953 can theoretically be applied to completely represent the public values. The theorem states that under certain axioms of rational behavior, a decision-maker faced with risky (probabilistic) outcomes of different choices will behave as if he or she is maximizing the expected value of some function defined over the potential outcomes at some specified point in the future (Neumann and Morgenstern 2007 (60th Anniversary Edition)). This function is known as the von Neumann-Morgenstern utility function. Keeney highlights that such a function is appropriate for addressing both the preferences for achievement on multiple objectives and the impact of uncertainties inherent in almost all public decisions. It also provides a logical framework to examine the implications of the different viewpoints of different stake holders (Keeney, 2006). In order to specify the public values, five types of information are considered necessary (R. L. Keeney, Value-Focused Thinking 1992, 95-98). These are:-

(a) List of the general values appropriate to consider.

(b) Translation of each of those general values into specific objectives to be achieved.

(c) Structure of the objectives showing their relationships to each other.

(d) Definition of attributes to define and measure the degree of achievement for each objective and serve as a basis for describing consequences.

(e) Quantification of the relative desirability of all possible consequences.

The information gathered from DMs by employing HFLTS will enable the facilitator to rank the values and preferences by the DMs. These values and preferences will subsequently be employed to determine a consensus based value hierarchy. The detailed process will be highlighted in the chapter on Research Methodology. Currently, it is considered relevant to revisit the basic concepts of Game Theory and Negotiation Analysis since the sub committees are likely to employ these techniques as highlighted in Figure 7 as discussed earlier. However, since our research problem deals with situations where decisions within the core committee will be made by group of decision makers representing parties; the preparation to reach a viewpoint / stance to be presented in core committee may be arrived by a single DM with in a sub-committee; therefore the broad concepts of various techniques are illustrated in Table 5.

Various Techniques for Decision Making

Analytic Hierarchy Process (Single DM)	**Value Focused Thinking** **Single DM**	**Negotiation Theory** **(for Many Parties)**	**Game Theory** **Bi Partite**
Problem definition	Problem identification	Establish common purpose Set of terms to be negotiated Set decision rules	Problem identification
Structure the decision hierarchy with goal at the top, objectives and alternatives at the end	Construct value hierarchy, develop evaluation measures and create value functions	Framework to coordinate thinking Decomposition of tasks Allocation to sub committees Facilitator advisable	Evaluate the possible options available with both parties. Calculate pay offs
Construction of pairwise comparison matrices	Weight value hierarchy, generate alternatives, score and rank alternatives	Time management for each task	Choose an option that will maximize payoff
Calculate final priorities of alternatives	Probabilistic & Sensitivity Analysis	Synthesis & Deliberations Consensus decision	

Table 5 Various Techniques for Decision Making

2.11 Negotiation Analysis. Negotiations are essential in a multi-party group decision situation, where each party may have its own objectives, but are obliged to make a joint decision (Raiffa, 2002). Joint decisions shift the focus from separate interactive actions to group actions where the final decision is of central importance. The case of RRR is considered an appropriate example. While the members of the core committee will strive to reach a consensus based hierarchy, the negotiations to form like-minded groups and garner support on issues cannot be ruled out.

Once a joint decision is reached by the core committee, it is assumed that it will be binding for all parties concerned. However, negotiations to reach a favorable consensus are to be carried out concurrently. Raiffa, while elaborating on the key to fruitful negotiations, uses terms like Full Open Truthful Exchange (FOTE) (Howard Raiffa with John Richardson, 2002) between

all concerned parties which is rarely found in the practical world. The more practical approach is Partial, Open Truthful Exchange (POTE) which is desired compared to No Open Truthful Exchange (NOTE). Negotiations offer a great deal of creativity and flexibility and revolve around jointly maximizing the mutual gains. A party is naturally inclined to have a larger portion of the gains that it helped create with other parties. The dilemma, as defined by Raiffa, is the use of tactics to generate maximum gains in the initial stages.

2.11 Game Theory

Game Theory relates to the behavior of rational actors when their discrete choices interact to produce payoffs to each player (Howard Raiffa with John Richardson, 2002). The process is interactive and all players make independent decisions; however, these separate decisions interact to determine a pair of pay offs for each side. The application of game theory in RRR scenario finds relevance again in the subcommittee level. To elaborate further, consider the example of pre-withdraw Afghanistan where members of the core committee would like to deliberate upon the payoffs or the perceived benefits to another group on some issue. It is fair to assume that before putting across a preference in the core committee; a member would have discussed the same point at the subcommittee level and reached the decision (to be communicated in core committee) after investigating options via game theory. It is important to keep in mind the key assumptions from the game (Colman 1998), these are listed as:-

(a) Every player must act, even not reacting to a situation is an act.

(b) The payoff depends on what both players choose, not on one players act.

(c) While a particular choice of the opponent in a situation is not known, but the entire set of available options available is known to both players.

Game theory deals with the art of predicting the other player's strategy and thus involves psychological aspects which are important for group decisions and consensus. While it is not the ideal method to be employed for group decision making, it may be employed for meetings,

discussions on the sidelines to gauge and evaluate a strategy that will ensure the optimal payoff. It may also be a useful approach for any analyst team supporting a DM or group of DMs. This is considered appropriate since all the stake holders have their vested interests and would like to pursue them while the processes of consensus agreement is not finalized. In addition, Bullock *et al*. do suggest a methodology to develop strategies in competitive situations where the objectives of those involved are not necessarily the same.

2.12 Optimality in Decision Analysis. Optimality is the cornerstone of sound decision analysis in clearly defined settings. Similarly, for a consensus decision making, a dedicated effort to seek optimality (if it exists) is essential that synergizes the dividends for all stake holders. One of the challenges of group decisions is a way to measure them and distinguish between outcomes. Monetary value of outcomes is a good yardstick to rank alternates as found in abundance in related literature. However, for the case of RRR, monetary values are not sufficient for most, if not all, scenarios. Therefore choosing and agreeing upon appropriate measures and metrics to rank alternatives before a final decision is made is imperative.

One of the metric that may be used is the calculation of payoffs, which is a real number and can represent profit, quantity, utility and can be further classified as “cardinal payoffs” and “ordinal payoffs” where the latter is the rank desirability of outcomes (Tesfatsion 2017) . It is widely used in game theory. Game theory is a way of analyzing competitive situations in which the outcome of a strategy for one player depends on what strategy the other player uses. That’s a rather broad set of situations, and game theory can be used to model many different behaviors. The average payoff of a strategy is the sum of the payoffs for each possible outcome multiplied by the probability of each outcome. In the simplest case, this is

$$P_{win} \times (\text{payoff for win}) + P_{lose} \times (\text{payoff for loss}) = \text{average payoff}$$

Payoffs are calculated on average for the entire population. That is, the payoff for a strategy is the average over all possible options. If a strategy is conditional (e.g. act one way for one

alternative and another way for another alternative), the payoff for each alternative needs to be calculated, the product of calculated payoffs and occurrence probability of the alternatives will render the required result. Figure 10 highlights the matrix representation of payoffs.

No Fight	Payoff if both are willing to fight	Payoff when the row player wants to fight	Fight
Fight	Payoff when row player doesn't want to fight	Both players do not want to fight	No Fight

Figure 10 A simple decision paradigm

Game theory, remains a valid option to be employed on the sidelines as track 2 diplomacy tool. United States Institute of Peace describes track 2 diplomacy as a process that brings together unofficial representatives on both sides, with no government participation. Neither track 1.5 nor track 2 discussions carry the official weight of traditional diplomacy, as they are not government-to-government meetings. What they offer is a private, open environment for individuals to build trust, hold conversations that their official counterparts sometimes cannot or will not, and discuss solutions (USIP 2019). Its usage therefore finds a limited application in our research; none the less it can just not be completely ignored.

2.13 REVISITING PROJECT MANAGEMENT IN DEVELOPING COUNTRIES

2.13.1 Background

Conditions in a conflict torn country often mirror those in developing countries exacerbated by the horrors of war. Any restoration efforts will need to consider project management concepts required in developing countries. This section reviews some of these concepts after summarizing some basics regarding developing nations.

Kofi Annan, former Secretary General of the United Nations, while speaking at the Tenth United Nations Conference on Trade and Development ("UNCTAD X"), Bangkok, 12 February 2000 defined a developed country as "one that allows all its citizens to enjoy a free and healthy life in a safe environment"[17]. However termed, a developing country (or a low and middle income country (LMIC), less developed country, less economically developed country (LEDC), or underdeveloped country) is a country with a less developed industrial base and a lower Human Development Index (HDI) relative to other countries (O'Sullivan A, 2003). Another definition comes from Thomas P.M. Barnett who divided the world in core and gap countries (Barnett, 2004). While there is no single universal definition of developing countries, the common challenges include:-

(a) High levels of poverty – measured based on Gross National Income (GNI) per capita averaged over three years. For example, if the GNI per capita is less than US $1,025 (as of 2018) the country is regarded as a least developed country[18].

[17] http://www.unescap.org/unis/press/G_05_00.htm Accessed on 11-12-18
[18] UN-OHRLLS Criteria for Identification and Graduation of LDCs.

(b) Human resource weakness which is based on indicators of nutrition, health, education and adult literacy; for example low literacy levels.

(c) Economic vulnerability which is based on instability of agricultural production, instability of export of goods and services, economic importance of non-traditional activities, merchandise export concentration, handicap of economic smallness, and the percentage of population displaced by natural disasters.

Figure 11 Map of Developing & Developed World Developed World Developing World

According to International Congress of Qualitative Inquiry[19], the number of developing countries in 2022 totals 166. These are spread across the globe with majority being in the Sub Saharan African region (46 countries) followed by Latin America and the Caribbean with 33 countries (Khokar 2015). Figure 11[20] depicts the map highlighting the developed and developing regions. In light of such challenges, these countries must undertake projects that

[19] https://icqi.org/developing-countries-list/ accessed 02 May,2022
[20] https://blogs.worldbank.org/opendata/should-we-continue-use-term-developing-world accessed 02 May,2022

are conceived with an idea to improve the living conditions for the populace as part of Reconciliation Restoration and Reconstruction efforts (RRR). This research revisits and explores the challenges associated with these projects in developing countries, the reasons behind their success/ failures and suggests measures in light of risk perception and mitigation that can help improve the outcome of such projects.

2.13.2 The Dilemma of Projects in Developing Countries Developed states have more stable institutions and governments, which possess the capabilities and legitimacy necessary to govern those systems. On the other hand, less democratically developed states are often frail politically and economically. It is generally believed that sustained economic growth can take place only in the presence of political stability (Ishrat, 2009). Moreover, developing countries are often ill-resourced, but are not willing to continue to fund western companies to manage and conduct projects, particularly those that are of strategic importance to them (Jugdev Muller, 2005). When comparing project execution in the USA vis a vis the developing countries, Avots suggests that managing such project in a developing country is very different from managing a similar project at home in the USA (Avots, 1972). Sadly, many of the points brought up in the referenced study four decades ago are still valid today.

2.13.3 Key Aspects of Project Success in Developing Countries. Avots elaborates four key aspects that are imperative to the success of projects in developing countries.

1. First, projects in a developing country often have enhanced public visibility. Because of this visibility and the relative importance of the project to the nation in which it takes place, it may be monitored by various administrators. Although well intentioned, this monitoring may interfere with the efficiency of operations. This factor, while often appearing to be very subtle, can affect a number of political outcomes in developing countries. The selection of a project may be biased for

political gains rather than public welfare (Yanwen, 2012). An example is constructing a state of the art subway rail in Lahore rather than a hospital or a facility to provide clean drinking water in a country where 30% of all diseases and 40 % of all deaths are caused by contaminated drinking water (Daud, 2017). Therefore, when projects are launched in developing countries, the nation's population follows it, and the success or the failure bears consequences that go beyond the traditional financial cost benefit analysis.

2. Second, projects in developing countries often require new approaches and sometimes even a new technology. This requires meticulous planning and enhances the associated risks. Abdolmuhammadi believes based on experience, it seems that the majority of companies in developing countries who are implementing risk management do not always get the added value that they expect. This is often because they are attempting to import risk management from a different cultural setting, from developed to developing parts of the world (Abdolmohammadi, 2018). By understanding the history and culture, distinguishing the real needs, putting the required risk infrastructure and skills in place and tailoring the risk approach to meet the local setting, the chances of obtaining the hoped for value from imported risk management approaches from more developed countries can be significantly enhanced.

3. Third, resources available in many developing countries are adequate for only one or two major projects at a time (Avots, 1972). When, as often happens, a country takes on numerous projects at one time, the effects on each one are unpredictable. According to Eleonora Masini, an important factor between the developed and developing world is the human resources issue which means, almost by definition, a future-oriented one. The growing, young population in the

developing countries is in need not only of food, health and basic literacy, but also, of being able to meet the increasing demand for qualified people with the skills that are necessary to use the emerging and increasingly sophisticated new technologies (Masini Eleonara, 1990). The need for technical training required in developing countries is an essential requirement. In war torn areas, this may require training and job opportunities for youth who spent their formative years as child soldiers or in "Red Guard" like revolutions. Education, training and programs will be required to reintegrate these youths into a functional society and into careers beyond that of manual laborer (Avots 1972).

4. Analysts have found that most developing nations simply do not have adequate institutional capacity or trained personnel to plan and implement projects effectively. "In one country after another," former World Bank official Albert Waterston contends, "it has been discovered that a major limitation in implementing projects and programs, and in operating them upon completion, is not financial resources, but administrative capacity" (Waterston 1965). Sadly, Waterson's observation is still true in many developing nations. Numbers of people matter, and so does their training and experience. A well-developed entrepreneurial class, motivated and trained to organize resources for efficient production, is often missing in developing countries (Ishrat, 2009). The cause may be that managerial positions are awarded on the basis of family status or political patronage rather than merit or it may simply be an absence of the quantity or quality of education or training that is required (Yanwen, 2012). In today's world, a great deal of production is knowledge-intensive; a well-educated workforce is therefore an essential requirement. The abilities to read, to do basic calculations, to operate electronic equipment, and to follow relatively complex instructions are important

requirements for much modern labor. The developing countries are initiating vocational training programs to develop their youth; however, the pace is often less than desired. The Technical Education and Vocational Training Authority (TEVTA) is one such initiative in Punjab, Pakistan. Its mission statement highlights the rising awareness in developing countries; however matching claims with performance has a long way to go still in developing countries.

> *"To enhance global competitiveness in Punjab, through a quality and productive workforce by developing demand driven, standardized, dynamic and integrated technical education and vocational training service*[21]*."*

4. The fourth reason is the existing social and business environment has made significant impact on the project personnel and their dependents, who often find it difficult to adjust to a new way of life (Avots 1972). This is especially true when skilled workers move from a developed to developing country or the family stays back as a lot of developing countries with conflict are declared non-family stations due to security and associated reasons. The list is available with International Civil Service Commission, United Nations and is updated annually (Internation Civil Service Commission 2017). Given these findings, it is relevant to consider the typical challenges that are peculiar to developing countries.

2.13.14 Modified Approach for Developing Countries. In recent years, project management has become an important part of any organization, owing in part as a result of the changing nature of managing organizations due to technological advancement, and a complex competitive global marketplace (Maylor, 2006). Projects are the basic building blocks of development. Without successful project identification, preparation and implementation,

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21 http://www.tevta.gop.pk/about.php#:~:text=Mission%20Statement,education%20and%20vocational%20training%20service accessed 15 february,2020

development plans are no more than wishes and developing nations would remain stagnant or regress. The inability to identify, formulate, prepare and execute projects continues to be a major obstacle to increasing the flow of capital into the poorest societies (Adams Asare, 2017). Asare maintains that small projects, for the most part, are not real national problems; it is the large projects, and especially the medium-sized projects, that almost always present major problems for developing countries (Adams Asare, 2017). It is therefore imperative that concerted efforts should be centered on successful execution of medium sized projects that have the national political importance rather than large scale projects. The few challenges that are commonly faced are:-

(a) **Time, Cost and Quality**. The biggest challenge faced by all countries is to ensure that their projects deliver the decided objectives within stipulated time, specified cost and the specified quality. A group of Italian researchers concluded that the context of the public sector and procurement of large projects is ideal for corruption (Giorgio Locatelli, 2016). In developing countries, the political interventions or public and official scrutiny affects the timelines, fluctuating monetary prices vary the cost beyond perceived calculations, and the lack of trained human resource and absence of safety policies and protocols allows operational environments that are unfortunately exploited to deliver an inferior than agreed quality. Unfortunately, malpractices while awarding contracts that bypass merit evaluations and reward kickbacks and commissions that are often rife in developing countries.

(b) **Resources**. Projects rely on the effective employment of finite resources, be it human resource, equipment or facilities. As discussed earlier, most developing countries faces the challenge of ensuring that they make the most of these finite resources. Figure 12 represents the graphic comparison of average years in school. It is

not surprising to find that the top three countries are USA, UK and Japan whereas the bottom half includes developing and conflict ridden countries from Africa and Asia.

(c) **Human Resource**. The human resource is arguably the most critical resource in any project and one of the sternest challenge due to the dearth of skilled human resource in a developing country. Ensuring the "right person for the right job" at times becomes difficult to achieve and time sensitive projects do not always offer the opportunity to train local populace. Ultimately, the cost of importing skilled manpower burdens the project and the added benefits of developing local manpower cannot be accrued. In addition, local resentment can develop.

Average years spent in Education

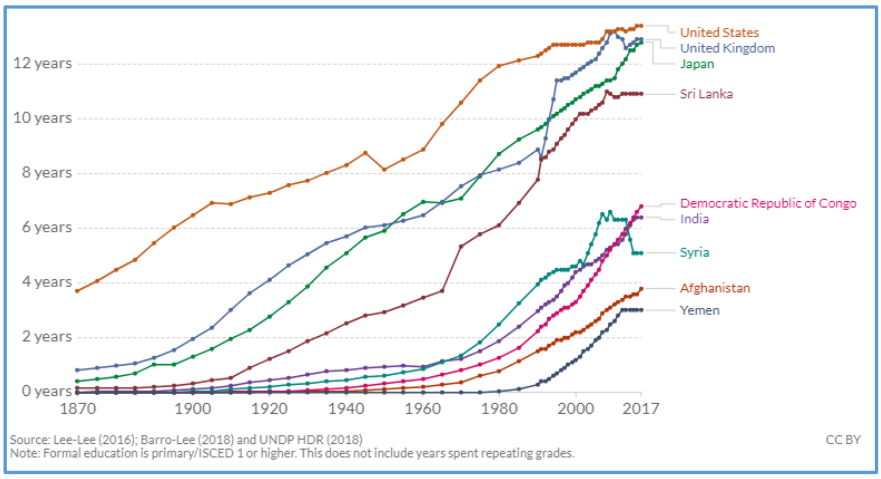

Figure 12 Average years spent in education (Lee and Lee 2016)

2.13.15 Project Management and RRR Successful, efficient and effective project management remains the cornerstone of development and transformation. The obvious yardstick for a common person to gauge the success of any national transformation effort is to look at the projects that have been completed in their vicinity (domestically). It is for such reasons that developing a consensus based hierarchy especially for the location and type of a project is considered imperative and addressed through the representation and weighting of the core committee members representing the local stake holders in an RRR effort.

2.13.16 Methodology of Executing Projects. Ika Lavagnon summarizes the three problem areas and four likely traps for project management in International Development in his research regarding failures of projects in Africa over the last six decades. Figure 13 depicts his key findings. It is evident from Lavagnon's work that the reasons are common for all the developing countries where institutions are not strong enough to deter corrupt practices. A few guidelines derived from various authors on successful project management in developing countries are postulated in the following discussion. An effort has been made to take into account all the tangible and intangible variables. However, small variations will have to be incorporated depending on the specific dynamics, culture and constraints of a developing country.

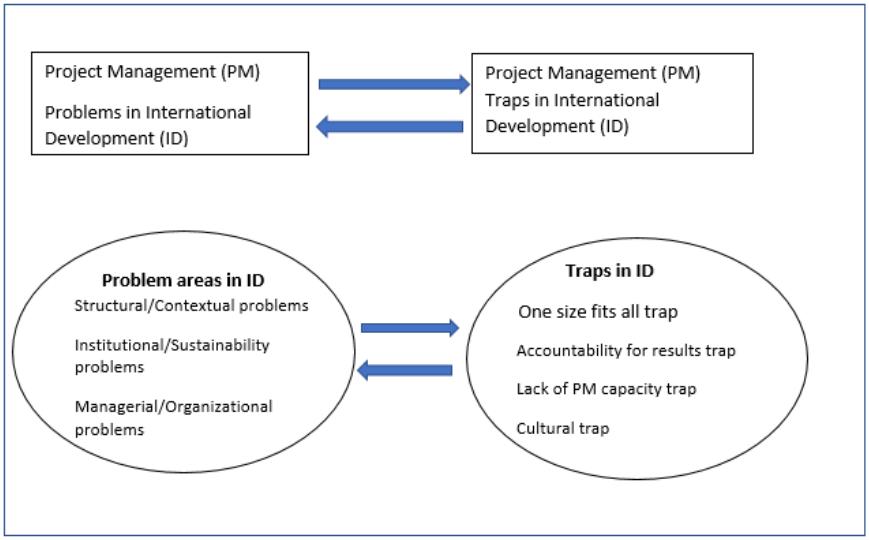

Figure 13 Problems and Traps for Project Management adapted from (Lavagnon,2012)

2.13.3 Methodology of Executing Projects in Developing Countries

2.13.3.1 Start with a model project. Given the premium that is attached to many improvement projects in developing countries, it is a good practice to start with a model project; a thought shared by many authors (Stuckenbruck, 1987) (Adams Asare, 2017) to name a few. A safe model project is easier to manage and is a good opportunity for the sponsor/ government to highlight it for political gains (Adams Asare, 2017). In practical terms, it offers the "hands on training" and the

opportunity to address the shortcomings before undertaking similar projects on a mass scale.

2.13.3.2 Choose a safe first project. Asare, among others, points out that the first project selected for implementation in a developing country must have a high probability of success (Adams Asare, 2017). The stake holders shall take into account that the selected project gathers public support and ideally is void of any controversy. Another key aspect is to ensure involvement of local expertise to enhance the ownership of the project by the local community and promote transparent recruitment of the execution team. This requires deep understanding of the local dynamics and micro social environments. General Douglas Lute, who served as a White House special advisor (Deputy National Security advisor for Iraq and Afghanistan 2007-2010) during the Bush and Obama administrations and the permanent US representative to NATO (2013-2017), told government interviewers in 2015 "We were devoid of a fundamental understanding of Afghanistan — we didn't know what we were doing,"[22]. The statement clearly explains an underlying reason for the unsuccessful rebuilding efforts in Afghanistan despite spending a massive amount of money.

2.13.3.3 Simple and Implementable. Choosing simple projects that are compatible with available technology, resources and skill level is another basic tenant that tends to be overlooked in developing countries. State of the art, complex technologies often have a plethora of limitations attached with them even in the most advanced societies let alone developing countries. In the longer run

[22] https://www.washingtonpost.com/graphics/2019/investigations/afghanistan-papers/afghanistan-war-confidential-documents/ accessed 12 April,2020

even if these projects are completed, their sustainment and maintenance can become quite cumbersome. A phased plan of implementation is essential.

2.13.3.4 Involve all Stake holders. A dedicated effort to involve all stake holders for the ownership of the projects is imperative for the project's success in developing countries. Local commitment must be sought to make a project management impediment free. Commitment can only be obtained by aggregate involvement of government officials, the bureaucracy, and the people. People will not become involved unless there is a belief that there is a benefit for them. For instance, will the project significantly positively affect their way of life and that of future generations? As a project develops, status of its progress or success will spread by word of mouth (Stuckenbruck, 1987).

2.13.3.5 Avoid Drastic Change. Project management should be implemented, where possible, so as to avoid drastic organizational disruption and any significant threats of change. Disruptive changes, such as loss of jobs, the indiscriminate or biased use of eminent domain, changes in work conditions, power struggles, loss of face, or management embarrassment, which might result from project failure, must be avoided. Impacts from necessary changes must be mitigated as part of the project plan.

2.13.3.6 Use Projects as a Vehicle for Change. Recognizing that the successful implementation of developmental projects in developing countries is often hindered by local management incapacity and inefficiency, projects can be used as an effective vehicle for change. The environment of a successful project effort can constitute an excellent training ground for future managers and skilled workers, and be an effective means of bringing about administrative reform.

2.13.4 Essentials of Planning for a Developing Country

Project management is assuming a central role in public administration of developing nations. The United Nations has long maintained that "Programs and projects are increasingly used in developing countries in the process of economic and social development since they represent a crucial element in both the formulation and implementation of development plans." (Rondinelli, 1976, 7(1)). The paucity of well-conceived projects is a primary reason for the poor record of plan implementation in many developing countries. The inability to identify, formulate, prepare and execute projects continues to be a major obstacle to increasing the flow of capital into the poorest societies. The failure lies in planning and to further narrow it down, absence of a workable implementation plan. The following points highlight the suggested essentials for planning projects in developing countries (Rondinelli, 1976, 7(1)).

(a) The plan shall encompass all factors and shall be holistic in nature. A dedicated effort to identify all resources and constraints must be made to enable over-all management visibility and the basis for more informed decision making in the crucial time before and immediately following the start-up.

(b) The project manager must also take every precaution to ascertain what priority their project will have in drawing on limited resources. In this task they face two difficulties. First, cost/benefit analyses may be impossible because much of the data necessary for such analyses may be missing. Second, even if the data are available, the economic considerations may be overruled by political ones. For example, some countries feel that they need a steel plant or a major airport as a matter of national prestige even though such operations cannot be economically justified.

(c) The "What If" plan or the fall back plan shall also be deliberated to avoid a "knee jerk" reaction to a situation. While risk mitigation can be executed to mitigate

anticipated difficulties, the plan must take into account the majority of events that can possibly happen in a mathematical manner.

(d) Managing a project is itself a challenging job in the best of environments; when one adds the dynamics of a developing country (let alone a conflict torn country), the job becomes even more challenging. While the literature is rife with the recommendations and "do nots" as suggested by Pinto and Kharbanda (Pinto and Kharbanda 1996) and displayed in Table 6 with minor modifications, it will eventually be a question of being flexible and adaptable to the varying situations and challenges. Such an approach can successfully be undertaken following the risk assessment and mitigation techniques and prescribed practices in the field of Decision Analysis.

How to Ensure a Project's Failure

No understanding of the project environment and the interests of all stake holders	Push a new technology to market too quickly	When problem occurs, shoot the one most visible without finding the root cause
Lack of comprehensive feasibility studies	Not admitting project failure	Appointing a weak leader for the project
No concrete plan for fallback options	Close controlling project teams and curbing initiative	New ideas are not implemented due to inertia of the system
Allowing political biases and infighting to dictate critical project decisions	No post failure reviews and thus no lesson learning	Lack of clarity on project trade offs

Table 6 How to Ensure a Project's Failure, adapted from (Pinto and Kharbanda 1996)

2.14 Project Portfolio Management

When it comes to multi-project environment, effective management of one individual project is not enough, especially in a development and transformation scenario. The fact that stake holders have more parallel projects increases the importance of coordinated management in the form of Project Portfolio Management (PPM) as highlighted by Killen, Hunt, & Kleinschmidt *(*Killen *et al,* 2007*)*. The role of Project Portfolio Management (PPM) is to evaluate, select, and prioritize new projects, as well as to revise priority, and possibly eliminate and reduce projects in progress (D. Danesh, 2015). The idea of PPM can therefore be extended to the development efforts where a number of projects in the entire spectrum are sequentially and simultaneously executed. The selection and relative priority of the projects is dictated by the mutually agreed value hierarchy as proposed in this research.

Young and Conboy suggest that PPM is derived from theories for portfolio selection in finances, and methods which proved to be successful in the fields of financial investments can be implemented in project portfolios. The concept of PPM came from two complementary, but independent drivers. The first one was the need to make rational investment decisions that would result in benefit for the organization, and the second was the need to optimize the use of resources in order to ensure that bringing that benefit would be conducted in effective and efficient manner (Young & Conboy, 2013). Rozita Petrinska-Labudovikj believes PPM to be a relatively new discipline of project management that coordinates and controls the projects in an organization's project portfolio with aims to maximize the projects' results, to balance portfolio risks and to align the projects to the strategic goals of the organization (Petrinska-Labudovikj, 2014). On a similar note, Trenton highlights that the major components of portfolio management include supporting strategic objectives, ensuring value creation, prioritizing projects based on their relative importance, managing the flow of benefits and integrating stake holders around business objectives (Trentim, 2013).

The key concept remains the alignment to the strategic goals, an essential attribute for a successful development and transformation efforts. The challenges and risks associated with projects in a developing world and especially conflict ridden countries highlight the importance of efficient implementation of project portfolio management as highlighted earlier. Some of the challenges identified through the literature review can be mitigated possibly through PPM. Table 9, modified from Petrinska-Labudovikj, lists some of the disadvantages of not incorporating PPM. The fundamental disadvantage remains the lack of alignment with the strategic objective which results in many related disadvantages spanned over both short and long terms. However, the lack of ownership by the local populace, their involvement in the entire program because of direct and indirect benefits delivered in their vicinity are significant shortcomings that can severely impact the outlook of the entire effort. The proposed methodology; emphasizes the development of a consensus based value hierarchy by all stake holders including the locals. The proposed method of allocating weights to the members ensures that projects rank in sync with the strategic objective. Biljana *et al* in their work divide the PPM into four phases segregated into preparation, planning, execution and harvest. The phases recommended by the research are highlighted in Figure 14. It is considered prudent to compare the phases and then analyze the perceived mitigation of the disadvantages highlighted in Table 6 when managing a project in a developing environment.

Phases of a Project in Sync with OR

Figure 14 Amalgamation of Operations Research Techniques and RRR

The urge to take on multiple major projects in a reconstruction of a war torn area must be carefully weighed against the points highlighted in this section on project management in a developing country. Reconstruction is ***not*** a short term effort. Well after a conflict ends, training and education will need to be developed and continued to create jobs and careers in a nation moving from a war footing to a nation maintaining a viable peace and moving toward developed status. Values and weights will change over time. Initial projects to restore civilian services may have to be initially led by outside nations, but the requirement to provide jobs, training and education for the local population must be required in any such contracts. As a trained work force and pool of managers (and analysts) are developed, projects can become more locally lead. Early consensus decisions on who gets what first will undoubtedly require

intense “horse-trading”. It will be important to be fair but not exceed a country’s ability to effectively manage a long term development plan that ultimately meets the needs of all regions of the conflict region. While a particular region may be unhappy they are not first on a list of developments, they are much more likely to agree to a consensus plan if they know that their region is in the plan for reconstruction…and they believe the plan will be executed.

RRR is a long term process that does not end when the conflict nation disappears from the headlines of the world press for some other lead story. It is a long term, dynamic endeavor that will need to be nurtured until a truly sustainable peace has been developed.

3 Research Methodology

3.1 Introduction

This chapter deals with elaborating a framework for a Reconciliation, Restoration, and Reconstruction (RRR) campaign in a conflict ridden country. It is considered relevant to reiterate the fundamental research questions that this research plans to answer. The research proposes a series of steps that may be undertaking sequentially and concurrently to execute an effective RRR effort. Each step in this chapter will be gauged in light of existing literature on the subject. The chapter will also focus on the rationale behind selecting a particular OR technique for each step and will attempt to highlight the benefits likely to be accrued. Moreover, the essential characteristics and critical areas during implementation will also be highlighted.

The broad conceptual flow chart is displayed in Figure 15 and Table 7 highlights the salient deliverables throughout the entire process. The figure illustrates the relative functioning of the core committee, subcommittee and execution committees.

Conceptual Flow of Proposed Plan for RRR

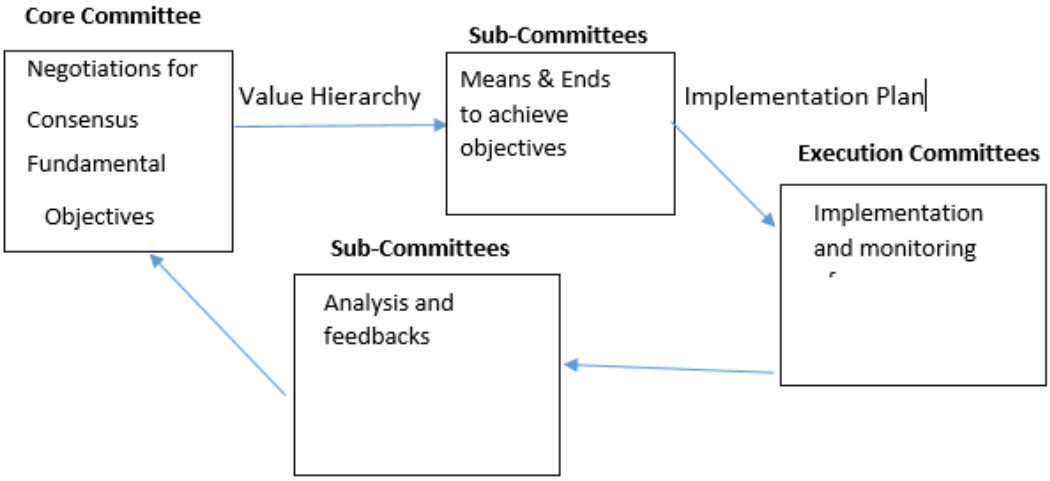

Figure 15 Conceptual Flow of Proposed Plan for RRR

The entire process has been divided in to six major steps while two additional steps are merged with the first six steps. The chapter will propose a methodology to achieve these steps.

Salient Milestones during the Process of RRR

Forum	Activity	Supporting Technique Used	Deliverables
Formulation of Consensus Based Value Hierarchy			
Referee and Facilitator	Initial framework of Value Hierarchy	Political, Socio-cultural and Economic aspects	A draft hierarchy prepared for presentation to core committee
Core Committee	Development of Value Hierarchy	HFLTS, VFT	A draft of Consensus based value hierarchy
Sub Committee for member *X*	Selecting a particular stance for an agenda item *Y* in Core committee meeting	Game Theory, VFT	A preference value to be suggested for an agenda item *Y* in Core committee
Sub Committee for member *X*	Following up after a core committee meeting, establishing stance of other members for agenda item *Y*	Negotiation Analysis, Game Theory	Identifying the requirements to coordinate with likeminded core committee members for agenda item *Y*
Core Committee	Finalization of Value Hierarchy	HFLTS, VFT,	Consensus based value hierarchy
Implementation of Consensus Based Value Hierarchy			
Core Committee	Selection of development projects	Project Portfolio Management, AHP	Ranking of projects in line with developed hierarchy
Monitoring of Consensus Based Value Hierarchy			
Subcommittees	Data Collection	Surveys, Questionnaires, PERT, CPM	Analysis and results of implementation process
Feedback of Consensus Based Value Hierarchy			
Core Committee	Feedback of implementation, results and analysis	VFT, PERT, CPM	Suggestions for revision and course corrections

Table 7 Salient Milestones during the Process of RRR

3.2 Step 1: Identifying All Stakeholders

A stakeholder is defined by Merriam-Webster dictionary as "one who is involved in or affected by a course of action[23]". Modern Stakeholder theory first became prominent in the 1980s and since then has been significantly developed by academia. Although the primary focus remained towards economic perspective, stake holders are a critical aspect of public policy issues as well and constitute a critical component of this research. Friedman, in his book *The Lexus and the*

[23] https://www.merriam-webster.com/dictionary/stakeholder accessed 28 June,2021

Olive Tree, stresses that key stakeholders must be satisfied at least minimally, or public policies, organizations, communities, or even countries and civilizations will fail (Friedman 1999). Correct identification of stake holders in a conflict ridden country is paramount to the entire success of an RRR effort. Paul Nutt's research concludes that out of 400 decisions, half of them did not achieve their objective since the decision makers failed to attend to the interests of and information held by key stakeholders (Nutt 2002). Bryson argues that wise use of stakeholder analyses can help frame issues that are solvable in ways that are technically feasible and politically acceptable and that advance the common good (Bryson 2007).

Bryson highlights a series of techniques to identify correct stake holders and proposes "Stakeholder Analysis" to commence the exercise (Bryson 2007). The key aspect remains that stakeholders shall be included if they are considered necessary and contributing to the entire process (Frederickson 1996). This step in our research effort is proposed to be undertaken by the referee organization, like the U.N. for example. It is also proposed that the essential element to consider is to arrange for unbiased facilitators and specialists to conduct these stakeholder analyses. In our proposed framework, this responsibility may be assigned by the referee organization to facilitators who will not be involved in any subsequent process to remove any biases in selection of relevant stakeholders.

Potential Techniques for Identifying Stake Holders

This section reviews some potential approaches for identifying key stakeholder.

Power versus Interest grid charts. Power versus Interest grid charts (Bryson, Patton and Bowman 2011) is a technique that helps identify the interests and power bases to be considered for each stakeholder. It also points to the consequences of coalition formation with in the stakeholders. The power versus interest grid is displayed in Figure 16. In any conflict ridden country, stakeholders can be categorized in one of the boxes of Figure 16. In an RRR scenario,

using this grid can help in determining the contrasting interests of stakeholders and can be leveraged to advance the interests of subjects which are in line with the overall aim of an RRR effort (J. M. Bryson 2007) .

Stakeholder Influence Diagrams. Stakeholder Influence Diagrams highlight the influence relationship over a power versus interest relationship. The idea is to be able to clearly identify the bases of power for different stakeholders versus their interests in the problem context. An example

Power versus Interest Grid

Subjects Significant interest but no power	**Players** Significant interest and substantial power
Crowd Little interest and little power	**Context-Setters** Substantial power but little direct interest

Interest ↑

Power →

Figure 16 Power versus interest grid adapted from Eden & Ackermann (Eden and Ackermann 1998; P122)

adapted from Eden and Ackermann (Eden and Ackermann 1998 ;p122) is displayed in Figure 17. Players have both the power and the interest and are normally in a position to influence others through the power they enjoy. The direction of the arrows indictaes the influence that can be leveraged.

The proposed framework for a RRR effort is likely to be composed of stakeholder that meet the categories described in Figure 16. The power versus interest grid technique is considered suitable for adoption into this research. This method, while easy to implement, will also enable us to categorize stakeholders in relevant groups and will provide insights into possible alliances and coalitions for pursuing common interest. In addition, the technique promotes the view point of the subjects which in an RRR situation are the people benefiting from the entire RRR effort. A likely area of concern while selecting stakeholders in a conflict ridden area can be the inclusion of rogue elements and warlords as stakeholders.

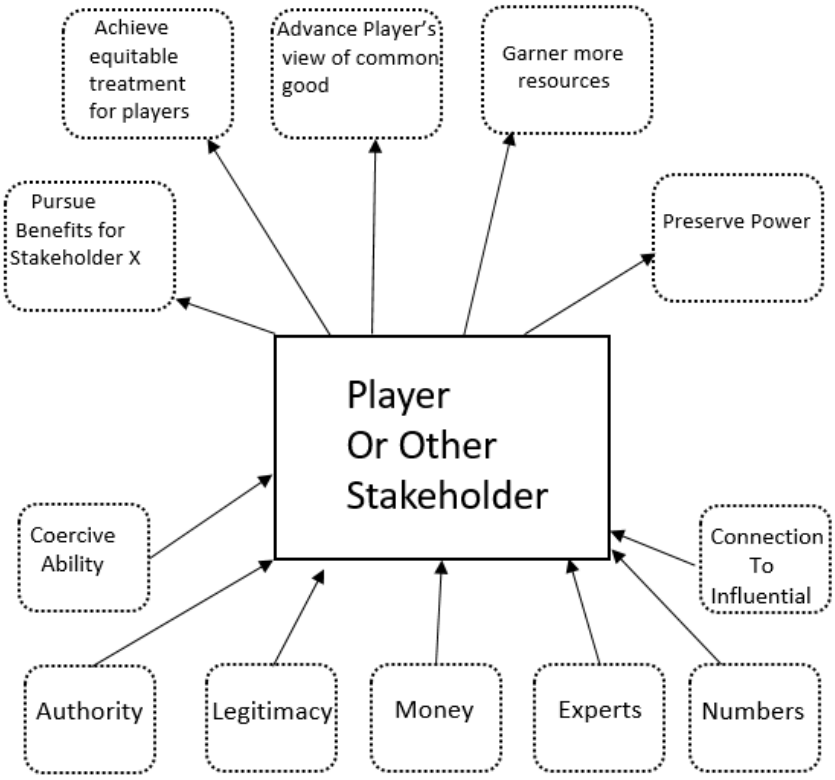

Figure 17 Influence Diagrams adapted from (Eden and Ackermann 1998; P122)

3.3 Step 2: Composition of the Core Committee

After identifying the stakeholders as highlighted in Step 1, the next step is to form a core committee comprising of these stake holders. It is pertinent to mention that in a conflict ridden territory, the stake holders will broadly be categorized in three groups' i.e domestic, occupying

coalitions or states and international organizations. Figure 18 gives a pictorial view of the stakeholders that are considered relevant in the United Nations Sustainable Development Goals (UNSDG). While the process of choosing stakeholders from the international organizations and the international coalition may not be that cumbersome, it is the domestic selection that requires meticulous execution. Often after the outside intervening forces withdraw, factions that were fighting an outside enemy, turn towards each other as witnessed in Afghanistan, Iraq, and Somalia to name a few. Ballentine and Nitzschke in their report for International Peace Academy highlight that the prime reasons for violent conflict have been the result of inequitable access to vital resources, competition between social groups for political power, and incompatibilities between groups with different senses of identity, opposing ideologies, or irreconcilable value systems (Ballentine and Nitzschke 2003). Therefore for any RRR effort to succeed, the framework proposes to engage and ensure that all factions in a conflict ridden country are represented adequately and are engaged constructively. The composition of the core committee remains one of the foundation stones that will critically impact the success of the entire RRR effort.

The research proposes that a core committee constituted for a RRR effort shall possess the following characteristics;

(a) It shall represent all the relevant stake holders. Janna Hunter-Bowman states that contributions from violence-affected parties are vital in the design and implementation of transition measures (Hunter-Bowman 2019).

(b) The proposed representation can be governed by a mutually agreed mechanism. The "integration" of bringing all the factions together is necessary. The integration will come with judicious representation. The local representation can be on terms of faith based preferences as conducted in Columbia in 2018 (Hunter-Bowman 2019), ethnic backgrounds as witnessed in

Kosovo (Baldwin 2007) , or tribal loyalties (where they exist) as seen in Africa and Middle East. The research illustration proposes allocation on the basis of ethnic population for various local stake holders. The rationale of preferring ethnicity over faith and tribal loyalties lies in the lesser number of problems it is likely to pose. Moreover, ethnicity can be a rallying point to gather a group, using religion or tribal loyalties is likely to be more complex, violent and temporary.

(c) The selected international members must have a direct stake in the conflict (Dobbins 2010). These could be the intervening forces or countries directly embroiled in the conflict.

(d) The international organizations like the UN or other appropriate groups shall be given responsibility to steer towards a consensus based solution and may have the deciding vote in case of a tie or no consensus.

Figure 18 Stakeholders in a conflict country adapted from (Reed, et al. 2009) UNSDG

A judicious selection of members and their proportionate representation will ensure transparency and legitimacy of the core committee both in the domestic and international

arenas. Failure to effectively implement this step is likely to result in disapproval of stakeholders both local and international with the RRR effort.

3.4 Step 3: Relative Priority for the Stakeholders

Allocation of priority weight vector for members of core committee remains a process that requires thorough deliberations. Significant research has been carried out in the past for allocation of priority weight vector for the Decision Makers. Some examples include the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) proposed by Ching-Lai Hwang and Yoon (Hwang and Yoon 1981), Zhongliang Yue further developed TOPISIS in a group decision making environment (Yue 2010).

The case of RRR is unique; keeping in mind Arrow's impossibility theorem (Arrow 1950) which states that when voters have three or more distinct alternatives (options), no ranked voting electoral system can convert the ranked preferences of individuals into a community-wide (complete and transitive) ranking while also meeting the specified set of criteria of unrestricted domain, non-dictatorship, Pareto efficiency, and independence of irrelevant alternatives. Interestingly, Arrow's theorem is not applicable for cardinal voting (the method to elect a pope in the Vatican). It was difficult to find a mutually agreed voting mechanism that may work in RRR situations. The research proposes to initially allocate the same priority to all the members. Subsequently during the analysis, the effect of varying the priority vector can be studied in detail to gain insights into their influence across the RRR effort. A two third majority is set as a requirement for consensus which is considered common in such situations (Hartnett n.d.) . Additional or stricter limits can also be proposed based on the different dynamics of the RRR effort in a particular country or conflict region. The actual configuration for any given RRR will depend on the circumstances of the conflict and can be adjusted based on existing circumstances. After formulation of the core committee, achieving consensus within the committee to develop a consensus based value hierarchy in the next step in the proposed

framework. However, before the formulation of a proposed hierarchy, it is considered prudent to briefly review commonalities in the selected literature on the subject.

3.5 Formulation of Consensus Based Value Hierarchy; Key Aspects for Consideration

It is considered pertinent to revisit the key aspects that have been considered by various authors while commenting on the subject of Nation Building which is considered a subset of RRR for this research.

3.5.1 The Quest for Viable Peace. Covey, Dziedzic and Hawley in their book *The Quest for Viable Peace* analyze the case of the Kosovo Conflict (Covey, Dziedzic and Hawley 2005). The authors term stability operations as "Conflict Transformation". The authors note that peace and stability are brought to a failed state through transformation of politics, security, rule of law and the economy. In the book, Covey references UN Resolution 1244, which articulated the United Nations Interim Administration Mission in Kosovo (UNMIK) sub objectives to address the objective of politics. The two formal sub-objectives were to establish an interim civil administration and to make progress toward substantial autonomy and democratic self-government.

3.5.2 The Beginner's Guide to Nation-Building. James Dobbins in his book *A Beginner's Guide to Nation Building* (Dobbins *et al* 2007), describes the nation building process under the following headings;

(a) Planning. Military forces are quite adept at planning, however planning for nation building requires a military to take civilian components on board and execute joint planning for the operation. The issues meriting immediate attention shall be:

(i) Mission's Objectives

(ii) Intended scale of commitment

(iii) Institutional arrangement for managing the commitment

He professes that, after mitigating the reason for intrusion (to halt aggression, to stop genocide, to destroy weapons of mass destruction, and so forth), intervening authorities are left with a bigger task to **refashion** the society which requires meticulous pre planning (J. F. Dobbins 2010).

(b) Co – Option versus Deconstruction. **Co-option** is defined by Dobbins as an approach where intervening authorities try to work within existing institutions and impartially deal with all social forces and power centers. The other approach termed as **Deconstruction**, is where intervening authorities first dismantle an existing state apparatus and then build a new one. During this later process they consciously empower some elements of the society while disempowering the others. Historically UN peace keeping missions follow the first approach whereas US led interventions have often followed the second (Dobbins *et al* 2007) approach. The driving reason behind each approach is the mission objectives, as bigger objectives are unlikely to be met with the Co- option strategy The needs of a troubled society and resources available with intervening forces also contribute to the choice of strategy (Dobbins 2010, p -22).

(c) Institutional Frameworks and Consultative Forums. Nation building missions generally involve a mix of national, multinational and international actors. The **UN** provides the most suitable institutional framework for most nation building missions, especially those associated with low cost structure, a comparatively high success rate, and the greatest degree of international legitimacy. In missions requiring armed intervention, NATO and similar alliances are required at least at the initiation when the focus to halt aggression, stop genocide and destroy weapons of mass destruction. Such alliances however, often lack the capacity and capability for nation

building and will always require UN and other national or international actors to provide civilian components that are essentials for RRR. Dobbins highlight the importance of neighbors to such missions and stresses that **neighbors must be engaged constructively even if their past actions were unhelpful**.

(d) Setting Priorities. The prime objective of nation building is to make violent societies peaceful, not to make poor ones prosperous. Dobbins believes that first order priorities for any nation building mission are public security and humanitarian assistance. He ranks the priorities in the following order:-

(i) Security

(ii) Humanitarian Relief

(iii) Governance

(iv) Economic Stabilization

(v) Democratization

(vi) Development

Importantly, Dobbins suggests starting these in tandem where possible, but emphasizes that starting development before working on governance is more likely to fail than succeed.

(e) Seizing the Moment. The weeks immediately following the arrival of peace making and peace keeping troops are a time of critical importance. Their behavior will set the tone for how the local population perceives the operations. Later, after the cessation of major combat operations, intervening forces need to seize what is termed as the "Golden Hour" by Dobbins, through seamless execution of pre-planned efforts towards nation building. General Krulak (Krulak 1999) proposes a similar term of

"Three-Block War" to explain realities in battlefields of failed and failing nation-states (Annis 2020) where militaries may be required to simultaneously conduct full-scale military action, peacekeeping operations and humanitarian assistance within blocks of a city. The idea led to the term of "Strategic Corporal" where theatre leaders have to take independent decisions. The idea initially used by the Marine Corps (Krulak 1999), was later adopted by US, British Israeli and Singaporean militaries and has met mixed responses (Walter and Varey 2009).

(f) Soldiers and Peace. A dignified and mature conduct by intervening soldiers goes a long way in establishing peace and isolating the belligerents. Initially, the local population often will have fears and reservations and will be hesitant to cooperate. However, a professional approach by the soldiers during the execution of their mission and respect for local customs and religious beliefs is essential to shape public opinion to cooperate and achieve peace as quickly as possible.

(f) Rule of Law. The efforts to rebuild judiciary and correction systems are next after police reforms. In societies emerging from prolonged civil war, the legal system will likely have ceased to function. At the same time establishing balance between whom to forgive and whom to punish could be challenging. War crime tribunals, lustration and truth commissions are means to bring about the Rule of Law. Dobbins, suggests incorporation of war crime tribunals and lustration in **only those cases** where the intervening authorities have the capacity to quickly enforce the outcome and deal effectively with the resulting resistance.

(g) Humanitarian Relief. The humanitarian agencies are often working in unstable countries even before the foreign troops arrive. However, after the intervention, such agencies can only cooperate if a secure environment is established by the intervening

forces. Dobbins, stresses the extreme care and coordination is required between the military and Non-Governmental Organizations (NGOs).

(h) Governance. A conflict ridden society can strive to develop a democracy over time, but government is an immediate need after a conflict. The government ensures supply of basic amenities which are necessary to restore public order. The intervening forces need to oversee the establishment of a legitimate government, which would sustain itself once intervening forces leave, it is therefore essential that individuals (that form the legitimate local government) who are supported by intervening forces must be credible and impartial towards all groups and sects within the society.

(j) Economic Stabilization. The intervening authorities need to ensure that inflation is kept in check; they need to strengthen or create a central bank, ministry of finance and civil service commission. They need to keep a check on corruption since money often initially flows in abundance from outside donors. The intervening authorities often invite the World Bank, the International Monetary Fund, and/or the United Nations Development Program, among others, to assume the economic uplifting of the society, coordination of the donor effort and to keep the process efficient.

(k) Democratization. In the context of nation building, the process of democratization is viewed as a mean of transferring wealth and power to peaceful hands from the violent hands. It is the ultimate objective of intervening forces to bring a peace that is sustainable; the whole process of intervention is undertaken to remove the threat to the region and the world. The intervening authorities must be **cautious to the cultural requirements** and must not force their own brand of democracy / government; such an effort is doomed to fail. It has taken the US over 245 years to develop the republic the nation currently has and it is still evolving. It would be pollyannaish to

expect a war torn region with no history of a democratic government to develop a perfect one is a matter of a few years.

(l) Infrastructure and Development. Dobbins stresses that post conflict nations have a larger growth potential than settled nations. The quality of policies adopted by the intervening authorities and the host government determines the volume of growth. He stresses that the term "re construction" in terms of nation building does not simply mean rebuilding roads, homes and power plants destroyed during war. The most important task is to reconstruct institutions and policies that would in turn bring a sustained growth and peace.

3.5.2 Beyond Declaring Victories and Coming Home (Joes and Manwaring 2000)

In their effort, Joes and Manwaring discuss objectives of Stability Operations (SOPS) by compiling work of various authors that researched different aspects of establishing peace in a failed state (Joes and Manwaring 2000). Some of these objectives are dependent on first establishing a legitimate state. Joes and Manwaring state the **first objective is the establishment of law and order**, which is deemed essential for recovery of a failed state. Detaining and trying enemies of the state, regulation of civil life, restoration of local government by conducting elections and granting privileged status and international authorization to intervening forces are the sub objectives that help restore law and order.

The second objective suggested is the **isolation of belligerents**, which Joes and Manwaring assert can be achieved by separating insurgents from civilian population, clearing and holding onto territory, constructing barriers and fortifications and civilian resettlement areas (though it is a means and is not professed by the authors due to high probability of failure in achieving

stability as witnessed in Strategic Hamlet Program by U.S[24]). These are the physical means, the moral means are maintaining a legitimate government, ensuring military operation incur the least possible damage to the society and correct conduct towards civilians and prisoners by the intervening forces will help in isolating the belligerents. **The third objective suggested is sustaining life**, relieving sufferings and regenerating economy. The authors believe that pursuing these objectives will help in establishing peace and stability of the troubled region.

3.5.3 Winning the peace: an American Strategy for Post-Conflict Reconstruction (Orr 2004)

While reviewing Stability Operations, Robert Orr highlights four pillars of SOPS (Orr 2004). He mentions **security, governance, social and economic well-being, and justice and reconciliation** to be the critical ingredients of SOPS. The author mentions unity of effort, integration of security forces, disarmament, demobilization and reintegration of combatants, regional security and reconstruction of security installations, and information and intelligence as sub – objectives to achieve security. These four pillars were used (Fensterer 2007) by the US Department of State to coordinate post conflict strategy development (JFWC Doctrine Pam 7 2004, Department of State 2005a).Table 8 summarizes the work of various authors, the last column highlights the proposals forwarded in this research as the starting point for developing a consensus based value hierarchy.

3.5.4 Department of Defense Directive

Since the end of the Cold War, the United States has been increasingly involved in stabilization and reconstruction operations throughout the world. In many cases, the government has failed to rapidly and effectively respond when necessary (Buss, 2005, volume 09-05). These failures

[24] https://history.state.gov/historicaldocuments/frus1961-63v03/d197 accessed 02 July,20121

occurred, in large part, because the U.S. Government was not fully prepared to execute these operations. The U.S. Government's lack of preparedness in this area was most readily apparent after the fall of Baghdad (Buss, 2005, volume 0905).

The early stabilization and reconstruction efforts in Iraq were met with sharp public criticism and are largely viewed as the catalyst for change in the U.S. Government's policy concerning how stabilization and reconstruction operations are conducted. Within the Department of Defense (DOD), there have been three significant changes in the conduct of stabilization and reconstruction operations as mentioned in Government Accountability Office (GAO) report 07-549-Military Operations. First, the DOD formalized a new stability operations policy that elevated stability operations to a core military mission on par with combat operations.' Second, the DOD broadened its military planning guidance to more fully address pre-conflict and post-conflict operations.'" Third, the DOD developed a new joint operating concept to serve as the basis for how the military will support future Stabilization, Security, Transition and Reconstruction (SSTR) operations. It would be pertinent to examine the DOD Directive 3000.05 issued on December 13, 2018. The salient features of this directive include:-

(1) Stability missions are a core US military mission with importance equivalent to combat operations.

(2) The directive calls for a coordinated inter - agency effort in US administration and requires military to support and supplement SSTROs led by other US agencies, foreign governments and security forces, international governmental organizations.

(3) The military has to lead SSTROs to establish civil security and civil control, restore and provide essential services, repair and protect critical infrastructure, and deliver humanitarian assistance where required until it is feasible to transition lead

responsibility to other U.S. Government agencies, foreign governments and security forces, or international governmental organizations.

(4) It highlights the following areas in Para 4(d) to be of prime importance while conducting an SSTRO:-

(a) Disarming, demobilizing, and reintegrating former belligerents into civil society.

(b) Rehabilitating former belligerents and units into legitimate security forces.

(c) Strengthening governance and the rule of law.

(d) Fostering economic stability and development.

Salient Points for Nation Building / Stability / RRR

Dobbins	Covey	Manwaring and Joes	Robert Orr	DoD Directive 3000.05	Proposed Objectives
Security	Moderating Political Conflict	Establishment of Law and Order	Security	Security	Establishment of Security
Humanitarian Relief	Defeating Military Extremists	Isolation of Belligerents	Governance and Participation	Local Governance structures	Establishment of Law and Order
Governance	Institutionalizing Rule of Law	Sustaining Life, Relieving suffering, and Regenerating Economy	Social and Economic well - being	Promoting bottom – up economic activity	Maintenance/ Repair / Creation of Critical Infrastructure
Economic Stabilization	Developing Legitimate Political Economy		Justice and Reconciliation	Rebuilding Infrastructure	Establishment of Credible and Effective Indigenous government
Democratization				Building Indigenous capacity for such tasks	Establishing democratic institutions representing populace

Table 8 Salient Points for Nation Building / Stability / RRR

The classic "Fog of War" also finds relevance while conducting military aspects of the SSTRO in RRR by the US DoD. The U.S. military's dominant paradigm for operations is a six-phase planning construct, consisting of phase 0 (shape), phase I (deter), phase II (seize initiative), phase III (dominate), phase IV (stabilize), and finally, phase V (enable civil authority) followed by a return to phase 0 as highlighted in Figure 19. This appears to imply a linear progression of conflict through a culminating phase (phase III) of major combat operations, and then a "post-conflict" period of stabilization and transition, although the activities overlap thorough the phases. The research proposes synchronizing phases and activities synergistically to achieve the aim of entire campaign and post conflict period. While Figure 19 describes the notional operational plan phases during an armed conflict, a synchronized effort is proposed in Figure 20 to highlight the overlapping activities. The broad outline of goals proposes the concurrent steps that are deemed essential to undertake an effective SSTRO with the ultimate aim of bringing a sustainable and enduring peace in a conflict ridden region.

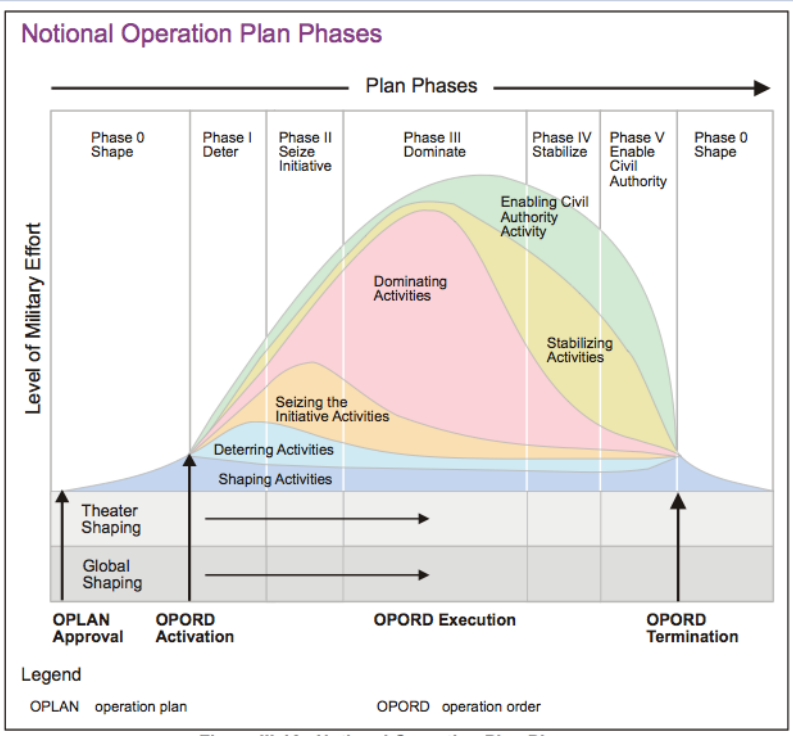

Figure 19 Notional Operation Plan Phases (Joint Publication (JP) 5-0, Joint Chiefs of Staff, August, 2011)

The focus remains on particular activities relative to each phase in order to highlight the important / critical steps for a successful RRR covering the entire timeframe of the conflict including the planning pre and post conflict timeframes. The underlying objective is to amalgamate project management and implementation mechanism employing the techniques learnt during optimization and project management along with social network analysis to propose a proactive approach to identify, analyze and suggest mitigation measures to unconventional threats to the proposed solution. These steps are required to sustain the return to peace and aid in assuring it is continuous.

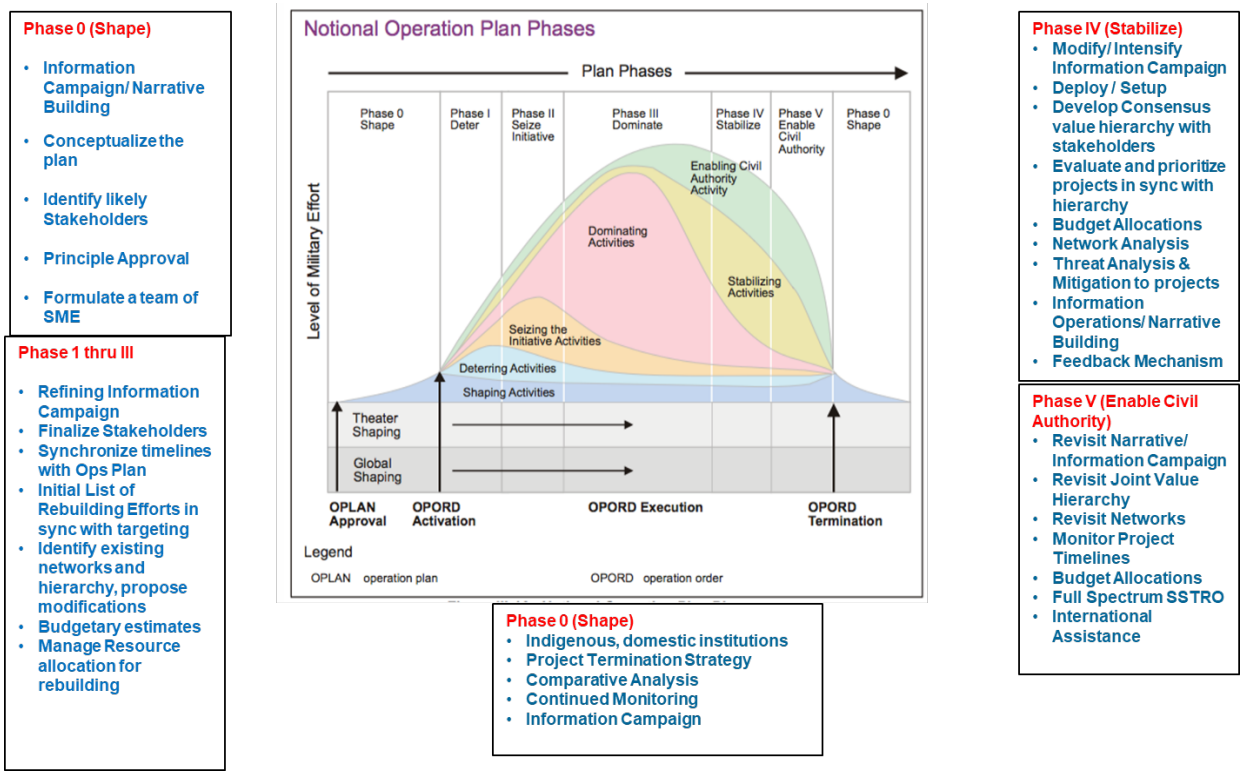

Figure 20 Overlapping RRR Goals with Operational Plans

3.6 Step 4: Develop a Consensus based value Hierarchy (CBH)

The next step involves developing a value hierarchy to implement the RRR effort as envisaged by a core committee. Development of a consensus based value hierarchy in our proposed framework is **preceded** by an initial skeleton hierarchy proposed by the referee/facilitator organization and derived out of literature and experiences. It will be critical, however, that even

this initial skeleton considers the local desires and culture of the conflict region, and is not just a reflection of the referee/ facilitator organization's beliefs. All the members of the core committee shall be introduced to the problem definition and consensus must be achieved before proceeding any further (Dillon-Merril, *et al.* 2008). The facilitators using the OR techniques of eliciting preferences and determining values from the members of core committee are to be of instrumental help in improving the initial skeleton, an idea that is supported by Figueira *et al.* (Figueira, Greco and Ehrgott 2005). A poorly developed objectives hierarchy is difficult to understand by the stakeholders (Dillon-Merril, *et al.* 2008) and will not produce the desired results. There are a host of techniques in the literature to elicit preferences from the decision maker. These include focus groups, semi structured interviews, discrete choice experiments, contingent valuation, and time trade-off; however, most of them deal with individual decision makers and find application in small scale problems and especially the medical field (Soekhi, Whichello and Levitan 2019). MACBETH (Measuring Attractiveness by a Categorical Based Evaluation Technique) is a Multi Criteria Decision Analysis (MCDA) technique that tries to answer questions of building an interval scale without eliciting direct numerical representation of preferences from DMs and how to employ additive utility model to aggregate them (Figueira, Greco and Ehrgott 2005, p-20). A fuzzy set approach to MCDA has been proposed by Meyer and Roubens to choose, rank and sort problems (Meyer and Roubens 2005). Hesitant Fuzzy Linguistic Term Sets (HFLTS) have been developed by various authors to elicit preferences from the DMs. This research proposes the use of HFLTS for eliciting preferences from the members of the proposed core committee. The rationale for selecting HFLTS is being cognizant of the diversity of the core committee, limited familiarity to a common language and lack of command and expertise on all the facets of the proposed initial framework as suggested by the referee organization.

The framework proposes to employ Value Focused Thinking (VFT) in conjunction with HFLTS to develop a consensus based value hierarchy. The key ingredient postulated by this framework is to ensure that such a hierarchy contains a valid representation of local values and preferences while meeting the demands of the international organizations and players. While reviewing literature for the subject, previous lack of cognizance for the local values and preferences **stands out as a primary impediment** to successful rebuilding and reconstruction as highlighted by various think tanks and authors (Pei and Kasper 2003), (Dobbins, *et al.* 2007). This aspect is ensured to be addressed by the proportionate presence of local stakeholders in the proposed core committee structure. DOD directive 3000.05 is considered a Gold Standard (Parnell, Bresnick, *et al.* 2013, 140) document in SSTR Operations for US forces. Paragraph 4.2 of the Directive states: Stability Operations are conducted to help establish order that advances U.S. interests and values. The immediate goal often is to provide the local populace with security, restore essential services, and meet humanitarian needs. The long – term goal is to develop indigenous capacity for securing essential services, a viable market economy, Rule of law, democratic institutions, and a robust civil society. (U.S Department of Defense 2005:2). It should be noted, however, that in reality, U.S interest may, at least in part, be contrasting to the interest of local people/ governments.

The framework proposes to employ Value Focused Thinking (VFT) in conjunction with HFLTS to develop a consensus based value hierarchy. The key ingredient postulated by this framework is to ensure that such a hierarchy contains a true representation of local values and preferences while meeting the demands of the international organizations and players. While reviewing literature for the subject, previous lack of cognizance for the local values and preferences **stands out as a primary impediment** to successful rebuilding and reconstruction as highlighted by various think tanks and authors (Pei and Kasper 2003), (Dobbins, *et al.* 2007).

3.6.1 Steps for VFT Process

This section elaborates the research methodology used for each step of the VFT process in light of existing literature and proposes a course of suitable action for step 4 in our framework. The guidelines for the proposed framework are derived from (Kirkwood 1996), (R. L. Keeney, Value-Focused Thinking:A Path to Creative Decisionmaking 1996), (Keeney and Raiffa, Decisions with Multiple Objectives: Preferences and Value Tradeoffs 1979) and (Parnell, Bresnick, *et al.* 2013).

(a) **Define the Problem and Identify Stakeholders**. Ralph Keeney in his 1994 article titled "Creativity in Decision Making with Value-Focused Thinking" highlights that Value-focused thinking (VFT) is designed to focus the decision maker on the essential activities that must occur prior to "solving a decision problem." He highlights a typical decision making process where firstly a decision problem is identified (R. L. Keeney 1994) which is mainly due to the unsatisfactory existing state and then the decision maker (DM) deliberates on some alternatives that are readily available and thus the DM is likely to ignore the values and the interaction between values and alternatives. Keeney advocates the term "Framing the Decision Situation" where the decision context and fundamental objectives together provide the "Decision Frame" (p 30). Dillon-Merril *et al.* (Dillon-Merril, *et al.* 2008) regard a concise problem definition as a focal point for the remainder of the analysis. In our proposed framework, the initial problem definition and stakeholder identification is proposed to be executed by referee/facilitating organizations for reasons highlighted earlier.

(b) **Identify Functions and Objectives**. Shoviak (Shoviak 2001) identifies construction of value hierarchy as the second step, whereas Parnell (G. S. Parnell 2007), Dillon-Merril (Dillon-Merril, *et al.* 2008) propose identifying the functions and objectives as the next step; which is considered more relevant. The framework proposes

that a consensus within the core committee must be achieved regarding the objectives. The boundaries for the framework as proposed by the referee organization, the members of the core committee and presence of any "gold standard" documents; such a structure presently does not exist in RRR scenarios that may be globally applied. This framework will contribute in providing a standard reference for implementation of RRR effort in any conflict ridden country. The OR techniques are the same as used in step 4 of the proposed framework. The framework complies with the 5 criteria highlighted by Keeney and Raiffa to gauge the effectiveness of a value hierarchy (Keeney and Raiffa, Decisions with Multiple Objectives: Preferences and Value Tradeoffs 1979).

(c) **Develop Value Measures and Value Functions.** Value measures are required for evaluating how well alternatives will meet each objective. Value measures should capture how well a particular alternative performs for each objective and will provide a standardized value that can be compared across objectives (Dillon-Merril, *et al.* 2008). For the proposed framework, a set of value measures from a choice of direct, indirect and proxy measures will be developed. Natural scales, where available, will be preferred over constructed scales. Once again a consensus will be required by the core committee to accept that the selected measure truly represents the objective with which it is associated. Dillon- Merril (Dillon-Merril, *et al.* 2008) cautions against using multiple proxy measures instead of constructing one direct value measure. The next step is to identify a suitable value function for each measure, these value functions will require consensus from the core committee and setting an appropriate function can be a challenging task for the facilitators. These single dimension value functions (SDVF) are important to capture the values of the core committee. The values are scaled such that the least desirable value is 0 and the maximum or the ideal value is 1. The SDVF can be discrete or continuous functions, however the four major shapes experienced are

linear, convex, concave and S curve (Parnell, Bresnick, *et al.* 2013, p-196). They must, however be monotonic functions or representations. Kirkwood has highlighted various techniques to assess the value functions based on preferences of decision makers. The critical aspects are defining the axes very carefully, defining the units and the range of value measure (Kirkwood 1996). Kirkwood recommends piecewise linear when the evaluation measure has a small number of possible scoring levels. This approach is proposed where applicable over exponential functions owing to the diversity and use of linguistic term sets in the proposed framework.

(d) **Generate Alternatives.** The search for alternatives should be a creative process focusing on the values guiding the decision (Dillon-Merril, *et al.* 2008). Keeney advocates that values are principles for evaluating the desirability of any possible alternatives and while values remain more fundamental than alternatives; alternatives are means to achieve values (R. L. Keeney, Creativity in decision making with value-focused thinking 1994). Value focused thinking is proposed for the framework since Keeney (R. L. Keeney, Value-Focused Thinking:A Path to Creative Decisionmaking 1996) believes that its biggest advantage lies in its ability to generate better alternatives where an ideal alternative can be identified through consensus. (If you have a value that one or more of the alternatives does not score well on, it suggests a re-design of the alternative or alternatives to address that value.) Parnell cautions against using value measures that do not discriminate between alternatives (G. S. Parnell 2007).

(e) **Assess Swing Weights.** Weights are required to trade off the objectives since not all value measures are equally weighted in the model. As Dillon-Merril, *et al.* 2008 point out, a key aspect is to consider the importance of a value measure weights. This will be critical to the proposed core committee. To begin this process determining the range between the lowest and highest levels of the value measure under scrutiny is a

key step (Dillon-Merril, *et al.* 2008). The Balance Beam technique as proposed by Watson and Buede (Watson and Buede 1987), the Ratio method by Edwards[25], the Tradeoff method by Keeney and Raiffa (Keeney and Raiffa, Decisions with Multiple Objectives: Preferences and Value Tradeoffs 1979), Swing Weights by Kirkwood (Kirkwood 1996) and the Swing Weight Matrix by Ewing, Tantino and Parnell (Ewing, Tarantino and Parnell 2006) are some of the techniques employed to assess weights. The proposed framework will employ the swing weight matrix technique using an additive value model after ensuring that value measures are preferentially independent.

(f) **Scoring Alternatives.** The additive value model is proposed to be employed in the framework to score alternatives. The facilitators of the core committee shall exercise caution to avoid inconsistencies and shall ensure that no biases like anchoring on information (Dillon-Merril, *et al.* 2008) exist.

$$v(x) = \sum_{i=1}^{n} w_i v_i(x_i) \text{where} \sum_{i=1}^{n} w_i = 1$$

v(x) is the alternative's value
I=1 to n is the number of value measure (attribute)
X_i is the alternative's score on the i^{th} value measure
$v_i(x_i)$ is the single dimension value of i^{th} value measure

(g) **Sensitivity Analysis.** Sensitivity Analysis is arguably the most essential part of any analysis. The uncertain "what if" scenarios can be reasonably answered by conducting a meaningful sensitivity analysis. To further elucidate, sensitivity analysis is a process of varying input parameters of a model within allowed area and observing

25 https://docs.oracle.com/cd/E16936_01/e1apps812pbr0/eng/psbooks/1apm/chapter.htm?File=1apm/htm/1apm04.htm accessed 04 May 2022

the resulting changes in the model solution. It explores how changes in the model output can be qualitatively and quantitatively attributed to different change in sources[26]. Andrea Saltelli defines sensitivity analysis as "the study of how uncertainty in the output of a model (numerical or otherwise) can be apportioned to different sources of uncertainty in the model input" (A. Saltelli 2004). He further describes sensitivity analysis as post-hoc analysis which tells us how robust our results are. He advocates that sensitivity analysis provides users of mathematical and simulation models with tools to appreciate the dependency of the model output from model input, and to investigate how important is each model input in determining its output. Martina Bris opines that sensitivity analysis attempts to establish how the model depends on the attributed values, on its structure and on the assumptions it is based on. It is an important method for testing the quality of a given model, and it is also used for checking the reliability of the analysis (Bris 2007). "Sensitivity Analysis of Additive Multi Attribute Value Models" authored by Hutton Barron and Charles P Schmidt (Barron & Schmidt, 1988) concluded that additive multi attribute models find their use in quite a few decision analysis applications. Barron and Schmidt advocate two techniques to be used for the sensitivity analysis, these are:-

(h) **Nearly Equal Weight Procedure**. Baron and Schmidt propose to solve the nearly equal weights hierarchy as a quadratic programming problem. The equal weights is the maximum entropy solution (Barron & Schmidt 1988). The procedure computes the weights for two non-dominated alternates to a pre-determined level of Δ. Consider two multi attribute alternatives x_b and x_I where i

[26] https://www.statisticshowto.com/sensitivity-analysis/ accessed 13 Jun,2020

$$\sum_{j=1}^{n} b_j v_j(x_{bj}) \geq \sum_{j=1}^{n} b_j v_j(x_{ij}) \forall i \neq j$$

The problem formulation is

$$Maximize - \sum_{j=1}^{n} w_j \log w_j$$

$$subject\ to \sum_{j=1}^{n} w_j a_j = \Delta$$

$$\sum_{j=1}^{n} w_j a_j$$

$$w_j \geq 0\, j = 1, 2, 3, ..., n.$$

This procedure has two limitations, the first is that the weights are nearly equal as derived from the solution that has limited ability for sensitivity analysis and moreover the procedure requires iterative calculations for calculating a constant which may be done through goal programming.

(i) Least Squares Procedure. Similar to the maximum entropy method principle, the procedure computes weights of one alternative that exceeds the other alternative by a pre-determined amount Δ. The objective function becomes

$$\text{Minimize } \sum_{j=1}^{n} (w_i - b_i)^2$$

The limitation of this procedure is that the non-negativity constraints are ignored for this problem and it can return with negative weights which can be solved through quadratic programming (Barron & Schmidt 1988).

(j) **Customizable One-Way Sensitivity Analysis (COSA).** COSA is a six step process proposed by Chambal, Weir, Kahraman and Gutman *et al* (Chambal, et al. 2011). COSA allows the decision maker(s) to tailor the sensitivity analysis to the desired decision context by assigning weight coefficients of elasticity to the attribute weights. These parameters let the decision maker choose how the adjusted weight

change is distributed throughout the model and is recommended by authors for complex hierarchies. It also ensures that the decision makers(s) review the model again and validate it. A particular application is hierarchies with multiple tiers, the first tier weights perhaps decided by the decision makers and SMEs are then tasked to carry out weighting for the tier below with in their area of expertise. The authors (Chambal, et al. 2011) propose a weight coefficient of elasticity and the bounds and propose the following equation to determine the coefficient through information gathered from the decision maker. The coefficients are set as 0 for unchanging weights and 1 for the incumbent w_s .

$$\alpha_i = \frac{w_i^0}{\sum_{j \in I} w_j^0} \qquad \text{For proportional analysis}$$

where $\sum_{i \in I} \alpha_i = 1$ and I is the set of indices for weights changing during sensitivity analysis, not including w_s. The biggest change in the value of w_s

$$-w_s^o \leq \Delta w_s \leq \sum_{i \in I} w_i^o$$

where w_s^o is the initial weight before change.

The new weights may be calculated based on the following

$$w_s = w_s^o + \alpha_s \Delta w_s = w_s^o + \Delta w_s$$

$$w_i = w_i^o - \alpha_i \Delta w_s$$

$$w_u = w_u^o + \alpha_u \Delta w_s = w_u^o$$

The new calculated weights shall be then applied to calculate alternatives and shall form a strong basis for the informed decision making.

3.7 Step 5: Implementation of Consensus Based Hierarchy (CBH)

After successfully developing a value hierarchy, the next step involves implementation of the hierarchy. The research proposes a multi-pronged strategy with immediate, intermediate and strategic actions. While doing the literature search, the aspect of linking a hierarchy or an action plan with implementation is not elaborated in detail. While each process is handled by different agencies, the core committee and the facilitators as proposed in the framework can help execute

a “single window operation”. The important aspect seen as a contribution by the proposed framework is the process of project selection, based on ranking the alternatives as envisaged in the consensus based hierarchy. Projects and focus areas need to be identified, ranked, funded and then implemented in a planned, staged fashion. Ivars Avots (Avots 1972), (Yanwen 2012), (Abdolmohammadi 2018), (Masini 1990), (Asare 2017) highlight the various challenges faced in project management in developing countries. Project management techniques like Project Evaluation and Review Technique (PERT), Waterfall Method, Agile method that includes Scrum Method and Test driven method, Critical Path Method (CPM) were reviewed. The CPM, PERT or simulation appears as suitable methods for our proposed framework since identifying the critical path will ensure optimal utilization of time, resources and facilities. The waterfall method is not considered suitable since its primary assumption is that all requirements can be gathered during requirement phase (Kee 2006) and cannot ensure quick changes of stakeholders requirements until the project is finished or nearly finished, thus, being more appropriate for projects that are considered to have more stable or unchanged requirements (Vallabhaneni 2018). Since RRR is a dynamic process, user requirements are anticipated to be modified based on recommendations by the core committee when required.

This step also requires that appropriate mathematical techniques involved in project and portfolio management be utilized; the decision for proposing the selection of a specific project should be mathematically justifiable and transparent while considering the stakeholders’ consensus values and objectives. The proposed mechanism is the additive value model or the preference voting model which is similar to additive value model, where members of the core committee individually allocate value and weights to projects in line with the strategic objectives. The project or projects can be ranked following this technique, the process is simple and easy to follow when compared to VIKOR method, Data Envelopment Analysis (DEA) or Frontier Analysis. Initially the weights of all the members of core committee can be set as

equal. Subsequently, weights can be adjusted through sensitivity analysis to examine the leverage they extend on project selection. Adopting this technique will help in applying the proposed framework in any RRR effort with suitable adjustments based on the developed value hierarchy.

3.7 Step 6: Managing, Monitoring and Reviewing

This step focuses on monitoring the implementation plan and ensuring that all the impediments are dealt with. Revisiting developed hierarchy forms is a cornerstone of this step. Project Portfolio Management is a concept that can be employed in multi-project environment as in the proposed framework. The fact that stakeholders have more parallel projects increases the importance of coordinated management in the form of Project Portfolio Management (PPM) as highlighted by Killen, Hunt, & Kleinschmidt (Killen, Hunt and Kleinschmidt 2007). The role of Project Portfolio Management (PPM) is to evaluate, select, and prioritize new projects, as well as to revise priority, and possibly eliminate and reduce projects in progress (D. Danesh, 2015). The idea of PPM can therefore be extended to the development efforts where a number of projects in the entire spectrum are sequentially and/or simultaneously executed. The selection and relative priority of the projects is dictated by the mutually agreed value hierarchy as proposed in this framework. The suitability of PPM for RRR is derived since the process coordinates and controls the projects in an organization's project portfolio with aims to maximize the projects' results, to balance portfolio risks and to align the projects to the strategic goals of the organization (Petrinska-Labudovikj, 2014). On a similar note, Trenton highlights that the major components of portfolio management include supporting strategic objectives, ensuring value creation, prioritizing projects based on their relative importance, managing the flow of benefits and integrating stakeholders around business objectives (Trentim, 2013). The disadvantages of not employing PPM are highlighted in Table 9. The committee can revisit the preference in hierarchy and alter them as required since the entire process is dynamic and can

accommodate changes required due to emerging circumstances. This attribute of adjustment and course correction over time makes the entire process a strong advocate for dynamic decision making and is considered an important strength, since a periodic review of the hierarchy, their relative weights, alternative ranking and project preferences will ensure that the process is flexible to adapt to changes in the operating environment. The analysis team and the core committee will need to consider the available resources and personnel available in a conflict area. Lack of these items may limit the number of projects that can be simultaneously undertaken.

Disadvantages of Lack of PPM in RRR

Lack of PPM	Short term Consequences	Long term Consequences	Impact
The strategic vision and fundamental objective is not incorporated	The projects are not aligned with the strategic objectives Resource allocation is haphazard	The quality and cost is not ensured The desired results are far from achieved	The local populace in the case of RRR does not take the ownership of the entire effort
Project selection is haphazard and influenced by emotions, political motives	Selected projects cannot be justified especially with foreign donors A specific area gets more focused instead of even distribution	Some projects may be left unfinished due to lack of funding or change in political environment	Local populace tends to lose faith in RRR efforts International donors earn a bad reputation due to the bias in the entire process
Optimal project prioritization is lacking	Non judicious utilization of resources	Projects are equally pursued without realizing relative importance and dividends	The portfolio lacks implementation of strategic vision and thus claims at conception cannot be validated through implementation
Contracts are awarded in non-transparent manner	Corrupt practices are common Quality of work is compromised	Projects do not adhere to allocated budget and timeline	The essence of RRR is lost and the intended benefit for the masses never gets delivered

Table 9 Disadvantages of Lack of PPM in RRR adapted from (Petrinska-Labudovikj 2014)

In addition to the six steps just discussed, there are several measures that are proposed to be executed concurrently during the entire campaign of RRR. These include but are not limited to:

3.8 Step 0: Relevant Data Collection

In order to evaluate performance and to monitor the progress, it is considered essential to gather relevant data on a regular basis. Conflict ridden territories often deal with difficulties in data collection; missing data is a real problem that is likely to be encountered in RRR effort. Missing data can have a large impact on analysis, final estimates and conclusions. It is extremely important to identify the effects of missing data in at least two key dimensions. The first dimension relates to identifying the potential of its occurrence while the second pertains to the effects it leverages on analysis and conclusions. Challenges for data collection in conflict ridden countries were reviewed.

The data collected through surveys, census, administrative and surveillance were identified as prime sources of data collection (Lieseleweski, Carlos and Asher 2010). Verma and Godale (Verma.R and Goddale 1995), Tsikriktsis (Tsikriktsis, A review of techniques for treating missing data in OM survey research 2005) highlights the importance of finding reasons for the missing data and analyzing the reduced statistical power due to it. Table 10 highlights the characteristics of missing data along with remedial measures as highlighted by Tsikriktsis (Tsikriktsis 2005). In addition, it should be noted that some forms of data collection considered normal in the West, may not be culturally acceptable in other cultures.

The proposed research is utilizes data from established sources like IMF, U.N, World Bank, Rand Corporation, and the Asia Foundation to name a few. Missing data for the purpose of the framework is not considered a limiting factor, however if encountered the referred table can be utilize to attempt to mitigate the challenge.

Missing Data Characteristics

Method	Concept	Applicability	Advantages	Disadvantages	References
List wise Deletion	Missing data is eliminated	Not recommended	Easy to use	Statistical power is lost, reduces statistical power	(Kim and Curry 1977), (Little and Rubin 1987)
Pair wise Deletion	Eliminates information only when the particular data point is missing	To be used with MAR and MCAR data	Lesser data loss than list wise deletion	Positive definite inter correlation matrix that prevents further analysis	(Kim and Curry 1977), (Roth 1994), (Raymond 1986)
Mean substitution	Missing value is replaced by mean	When correlations between variables are low and less than 10% data is missing	No data is discarded and easy to use	Bias introduced especially in determining variance, Reduces DOF	(Raymond 1986), (Little and Rubin 1987), (Hawkins and Merriam 1991)
Total Mean substitution	Missing value replaced by mean of available responses	When correlation between variables is low	No data is discarded and easy to use	Bias introduced especially in determining variance	(Little and Rubin 1987) (Quinten and Raaijmakers 1999)
Subgroup Mean substitution	Data is divided in sub groups, missing value is replaced by the mean of the relevant subgroup	Only when data can be divided into subgroups	No data is lost and easy to employ	The definition of subgroup can lead to biased results especially variance	(Ford 1976)
Case Mean substitution	The mean of all answers by respondent is used to substitute the missing value	Only to be used for construction of scaled scores	No data is lost and easy to employ	Assumes equal means and standard deviations	(Raymond 1986)
Regression Imputation	Estimates relationships among variables, uses coefficients to estimate the missing value	When more than 20% of the data are missing and variables are highly correlated	Estimated data retains the mean and the shape	Distorts the number of degrees of freedom and could artificially increase the relationships	(Little and Rubin 1987) (R. Little 1988)
Hot deck Imputation	Replacing missing value with another similar score from the data set	When data is missing in a certain pattern	Missing values are replaced by realistic values	No strong mathematical argument	(Ford, An overview of hot-deck procedures 1983)
Maximum Likelihood	Available data is used to estimate parameters and missing values	When the data can fit a known distribution	Accurate if the model is correct	Difficult criterion to match a distribution	(Lee and Chiu 1990) (Donner and Rosner 1982)
Expected maximization	An iterative process that continues until there is convergence in the parameter estimates	When the data can fit a known distribution	Accurate if the model is correct	The algorithm takes time to converge and is too complex	(Little and Rubin 1987) (Laird 1988)

Table 10 Characteristics of Missing data

3.9 Step 0* Opinion Shaping / Information Operations

Narratives have shown themselves to be powerful social forces that formulate identities and constrain as well as guide actions (Law 2000). The importance of a correct narrative building

for an RRR effort cannot be over emphasized. At the same time, during an ongoing RRR process, narrative approaches provide a way to understand how stories function in communities and how to intervene when destructive stories circulate (Federman 2016); an aspect that has been overlooked in the past especially during reconstruction in Iraq and Afghanistan (Azami Shah 2021) (Dobbins *et al* 2007). Narrative analysis can be divided in structural, functional and post structural narrative analysis (Federman 2016). Conflict Analysis through Structured Evaluation of Scenarios (CASES), also called scenario analysis, is a technique proposed by Andrew Blum which finds applicability for RRR effort (Blum 2005). While the narrative is a strategic concept spread over the entire RRR effort, the validity lies in identifying the networks with in the society. Ideally, they may be a narrative tied to the overall RRR program and other narratives tied to individual projects and efforts. The operations research technique for the proposed network is Social Network Analysis (SNA). SNA has been the focus of academia for last 3 decades and works by Bernadoni, Deckro and Robbins (Bernardoni, Deckro and J.Robbins 2013), (Renfro, Richard F.Deckro and Robbins 2003) Scott (Scott 1988), (Knoke and Yang 2019) are few of the many examples of SNA application for conflict ridden areas. Acceptance of the RRR effort by the local populace is critical to the success of the entire program. While the formation of the core committee with representation from all ethnic groups in a country is considered a unique and remedial step; a dedicated public image and perception building campaign to sensitize the public opinion is likely to yield better results.

This chapter has given an overview of how the individual OR elements can be fitted into a RRR program framework. Specific details will be driven by the conflict region, but the framework is flexible and aids in clarifying how both traditional and “soft” Operations Research approaches can be used to support the complex, wicked problem of Reconciliation, Restoration, and Reconstruction in a conflict region to gain over time a viable sustaining peace.

4 Implementing the Consensus Based Value Hierarchy

4.1 Introduction

This chapter further develops the proposed framework and illustrates its application through a notional case study based on pre-withdraw Afghanistan. While the evolving world situation prevents doing a complete analysis, this case study will illustrate the notional development of the value hierarchy and show how progress could be evaluated based on actual historical data. The selection of a core committee, developing a value hierarchy based on consensus, implementation of the hierarchy through project portfolio management followed by data collection for analysis, feedback and course correction are all highlighted stepwise in the case study. For the purpose of this illustrative example the case study is developed as if the analysis was actually executed, although it is notional.

4.1.1 Step 1: Identifying All Stakeholders

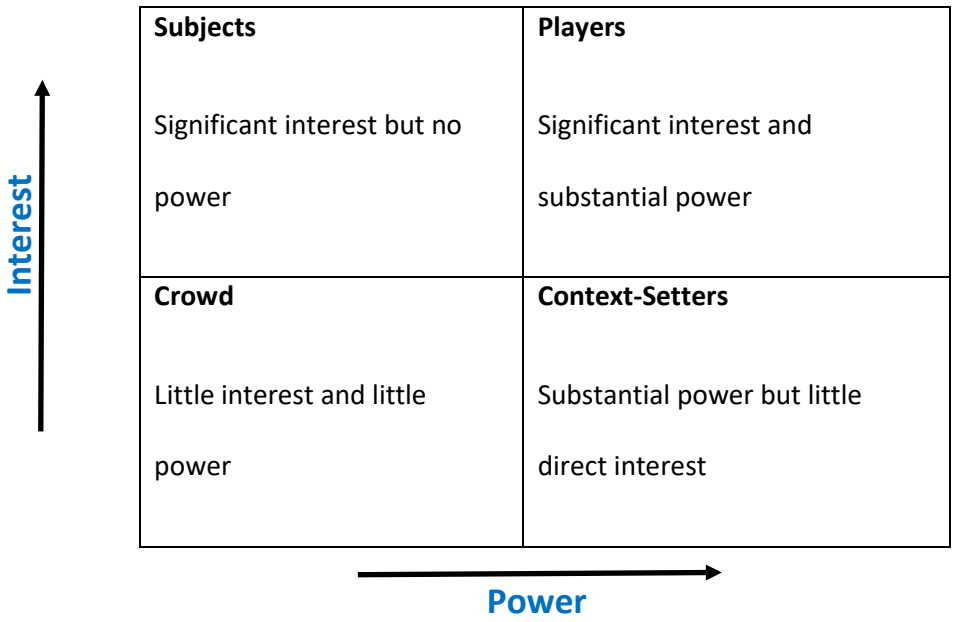

Figure 21 Power versus Interest Grid (Eden and Ackermann 1998; p122)

The power versus interest grid analysis (Eden and Ackermann 1998 ;p122) is used for the selection of the stake holders in the case study of pre-withdraw Afghanistan for this research.

Analyzing the grid, the “Subjects” that remain directly affected but with limited or no power are the common Afghani populace. They are represented in this research by the tribal leaders, Jirga representatives and people nominated directly by processes other than the elections, which is likely to be the case for a conflict ridden country. The players comprise international actors like the USA, Russia, China, European Union and so forth that have a significant interest and substantial power. Neighbors like Pakistan, Iran and India lie somewhere on the fringes of subjects and players. There can be a debate about placing Russia and China in the context-setters group; however, with the world being closely connected as of today and the Chinese initiatives of One Belt One Road (OBOR), the research proposes their inclusion in the players section.

4.1.2 Step 2: Composition of the Core Committee

With this background, the composition of the core committee remains one of the foundation stones that will critically impact the success of the entire campaign. The research proposes that any hypothetical committee constituted for an RRR effort anywhere in the world should possess the following characteristics;

(a) It shall represent all the stake holders.

(b) The representation can be governed by a mutually agreed mechanism. The facilitating organization, such as the U.N. must govern the inclusion process of all domestic and non- domestic stakeholders. The United Nations Sustainable Development Group (UNSDG) elaborates stakeholder analysis in a report published in 2016 (UNSDG 2016). The domestic stake holders can be selected on a variety of criterion. However, this research proposed ethnicity/ population representation as a yardstick. In a conflict ridden country, there are always more than one faction that represents the local populace. These factions are normally on the basis of ethnicity,

religion, political association. Ethnicity remains the least controversial and is therefore suggested as an appropriate basis to garner local support when compared with nation-state. It seeks to reconcile the centrifugal forces on ethnic basis with the idea of nationhood and, in the process, it assigns a central role to the state for building a nation (Sheth 1989).

(c) In case of non-domestic members of the committee, they must have a direct stake in the conflict (UNSDG 2016). These could be the occupying forces or countries directly embroiled in the conflict, International donor agencies *etc*. To elaborate further, for a hypothetical core committee constituted to undertake RRR in Afghanistan shall include all Afghan factions, the US, NATO , OIC and the UN, IMF and World Bank. Russia and China though have interests in the region but since are not directly involved must be abstained from representation in the core committee.

(d) The international organizations like the UN shall be given responsibility to steer towards a consensus based solution and may have the deciding vote in case of a tie or no consensus.

A correct selection of members and their proportionate resolution will ensure transparency and legitimacy of the core committee both in domestic and international arena. An example of pre-withdraw Afghanistan is highlighted in subsequent paragraphs. Figure 22 depicts the ethnic distribution of Afghan population. The pretext to consider ethnicity as a measure of representation requires further deliberation. Farhad Arian, of Edmund Rice Centre in Sydney states that after critically examining the participation of major ethnic groups in national political processes in the post-2001 Afghanistan, it is extremely hard to draw a picture of a genuine democratic power-sharing political system. This is a residual consequence of the UN-sponsored Bonn Conference of 2001 in which all conflicting parties (except the Taliban) participated in peace talks, but where no firm step were taken to provide the ground for genuine

representation of all major ethnic groups in national political and policy making processes (Azami Shah 2021). For example, at the Bonn Conference the people of Afghanistan were represented by a number of warlords who were accused of massive human rights violations throughout the civil conflicts of the 1980s and 1990s. As such, Afghanistan has not experienced a democratic power-sharing political system in the past decade; instead, the political system has been dominated by one or another state institutions[27].

Map of Afghanistan based on Ethnicity

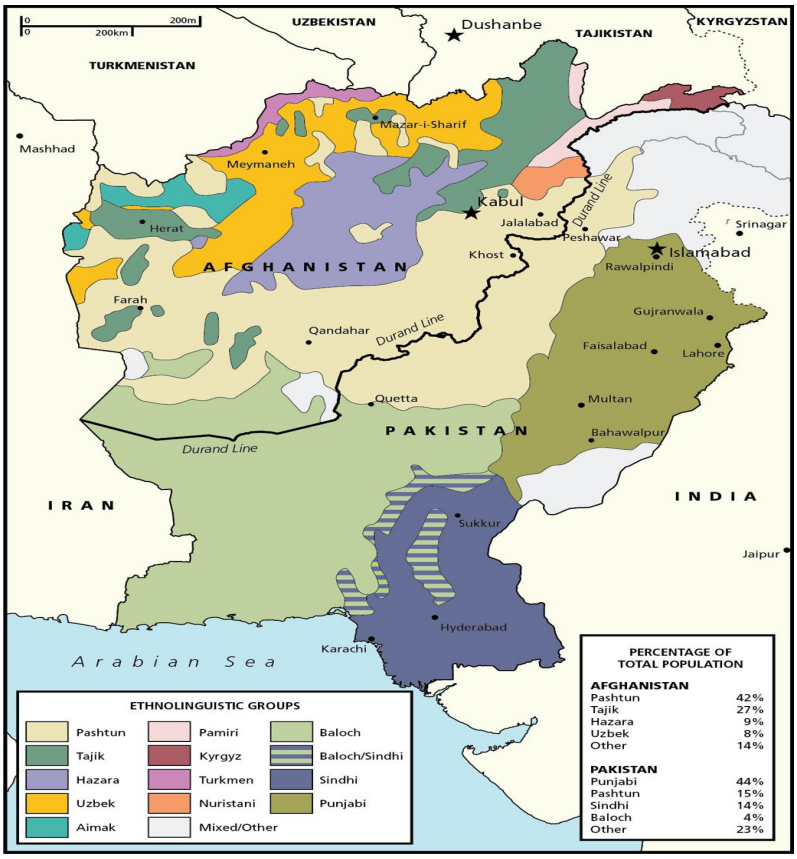

Figure 22 Map of Afghanistan based on Ethnicity (source: National Geographic 2013))

Therefore, formation of a committee that represents all communities of Afghanistan is a practical, if potentially contentious, idea. Thus depending on the percentage of the population,

[27] https://www.opendemocracy.net/en/opensecurity/could-power-sharing-build-consensus-necessary-for-peace-in-afghanistan/ accessed 02 Aug,2019

suitable representation can be assigned to every ethnic group and similarly on the basis of numbers an appropriate mutually agreed weight can also be given to every ethnic group for consensus decision making. For example, if the Afghan contingent was allocated 10 seats other than representation by the Afghan government in power, then 4 representatives from Pashtun ethnicity, 3 from Tajik, a member each from Hazara, Uzbek and minorities could be chosen. This would constitute the representation of the Afghan domestic representation. An argument can be made for lesser representation of the Taliban or that the government in Afghanistan is not recognized internationally; however, the Taliban remain an effective force in Afghanistan and are representative of a significant Pashtun population. The time frame assumed for such a committee is a post peace agreement and formation of a consensus government in Afghanistan will take a little bit of time. The "Inclusive" government as it is demanded by all international players will eventually have a significant representation from the Taliban.

The proposed pre-withdraw committee for the purpose of this illustration constitutes the following:-

(a) Representation from existing Afghan Government (ANA)

(b) Afghan Ethnic Representation (AER)

(c) US Representation from the State Department (DOS)

(d) US representation from the Department of Defense (DOD)

(e) USAID representation

(f) Representation from the International Monetary Fund (IMF)

(g) Representation from the World Bank (WB)

(h) Representation from the European Union (EU)

(i) Representation from the Organization of Islamic Conference (OIC)

4.1.3 Step 3: Allocation of weights for the Core Committee

Allocation of weights for members of the core committee remains another process that is quite complex in itself. It is proposed to allocate 60% weightage to the international members whereas 40% of weight allocation may be reserved for domestic stake holders. The rationale behind the weight allocation remains the availability of donations to rebuild; RRR requires massive funding by international players as conflict ridden areas are likely to have little financial resources. Similarly, 40% allocation implies that no single group from the domestic stake holders will be able to influence the desired value hierarchy. A two third majority is set as a minimum requirement for consensus. Additional or stricter limits can also be proposed based on the different dynamics of the RRR effort in a particular country. Overtime, as the RRR program progresses, these weights could change as more local authority is warranted. However, for this illustration, the 60/40 split will remain constant.

Table 11 highlights the salient characteristics of proposed committee in Afghanistan as an example. As discussed earlier the weight allocation has been done keeping in mind that no single entity can enforce a decision of their choice without gaining consensus support from at least some of the other stakeholders.

Weight Allocation of Core Committee

Stakeholder	Weights	Breakdown		Vote
Afghan Government	0.2	Representatives from Afghan Government, members of parliament		**Yes**
Afghan Ethnic Representation	0.2	Pashtuns	(42% of 0.2) 0.084	Yes
		Tajiks	(27% of 0.2) 0.054	
		Hazara	(8% of 0.2) 0.016	
		Uzbek	(9% of 0.2) 0.018	
		Minorities / Others	(14% of 0.2) 0.028	
United States	0.12	DOS,DOD,USAID		Yes
European Union	0.12	NATO, EU Parliament		Yes
IMF/ World Bank	0.12	Representatives from IMF and World Bank		Yes
OIC	0.12	Representatives nominated by Secretary General OIC		Yes
UNO	0.12	Representative nominated by UN Secretary General		Yes

Table 11 Weight Allocation of Hypothetical Core Committee

4.1.4 Step 4: Develop a Consensus based value Hierarchy (CBH)

Once the core committee is formed with mutually agreed weights, the next step involves developing a value hierarchy to implement the rebuilding plan. Since the success of entire process hinges on this step, extreme care must be undertaken in developing a consensus based value hierarchy. The key ingredient postulated by this research is to ensure that such a hierarchy contains a true representation of local values and preferences. While reviewing literature for

the subject, previous lack of cognizance for the local values and preferences stood out as a primary impediment to successful RRR in conflict ridden areas. This perceived shortcoming is mitigated by the "all inclusive[28]" representation in the proposed core committee. The idea postulated by the research has been supplemented by latest demands from the global community as witnessed during the US withdrawal from Afghanistan. The fall of Kabul confirms a failure of European and American strategic thinking in Afghanistan due to flaws in its ideological and conceptual foundations (Golden 2021). Danielle Pletka in her analysis of "What went wrong in Afghanistan" published in *The Wall Street Journal*[29] on 21 August,2021 highlights that history shows that foreign-imposed regime change rarely leads to democracy, especially in societies that are poor, mostly illiterate, ethnically divided and conflict-ridden. By adopting this goal, the U.S. had taken on a monumental social engineering project in a country it barely understood. As General Douglas Lute, the former NSC coordinator for Afghan strategy later admitted: "We didn't have the foggiest notion of what we were undertaking[30]."

A core committee with representation from all ethnic and political sources recognized by the international stakeholders is therefore the proposed way to start the RRR process in a conflict ridden country. The research developed a hypothetical case of developing a value hierarchy for Afghanistan. Based on the literature review, the following objectives were considered imperative for any RRR effort globally including Afghanistan.

(a) Establishment of Security

(b) Establishment of Rule of Law and Justice

(c) Creation of Economic Opportunities

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[28] https://apnews.com/article/afghanistan-russia-diplomacy-europe-moscow-83548066e87fbce4da0e7722ff7e1114 accessed 20 Oct,2021

[29] https://www.wsj.com/articles/what-went-wrong-in-afghanistan-11629472600 accessed 18 Oct,2021

[30] https://www.washingtonpost.com/washington-post-live/2021/08/31/transcript-afghanistan-papers-secret-history-war-with-ryan-crocker-lt-general-douglas-lute-craig-whitlock/ accessed 15 Feb,2022

(d) Environment conducive for Education

(e) Efforts for Socio Economic Uplift

One can argue on the selection of these objectives for a value hierarchy for an RRR effort. However, the objectives for this illustration are chosen as "collective wisdom" based on the works of researchers, authors and subject matter experts in the realm of nation building and reconstruction as highlighted in Table 12.

Salient Points for Nation Building / Stability / RRR

Dobbins	Covey	Manwaring and Joes	Robert Orr	DoD Directive 3000.05	Lessons from SIGAR 2021	Proposed Objectives
Security	Moderating Political Conflict	Establishment of Law and Order	Security	Security	Lack of Coherent policy	Establishment of Security
Humanitarian Relief	Defeating Military Extremists	Isolation of Belligerents	Governance and Participation	Local Governance structures	Lack of Security	Establishment of Law and Order
Governance	Institutionalizing Rule of Law	Sustaining Life, Relieving suffering, and Regenerating Economy	Social and Economic well - being	Promoting bottom – up economic activity	Lack of focal agency and unrealistic timelines	Maintenance/ Repair / Creation of Critical Infrastructure
Economic Stabilization	Developing Legitimate Political Economy		Justice and Reconciliation	Rebuilding Infrastructure	Insufficient monitoring and evaluation	Establishment of Credible and Effective Indigenous government
Democratization				Building Indigenous capacity for such tasks	Failure to understand Afghan context	Establishing democratic institutions representing populace

Table 12 Salient Points for Nation Building / Stability / RRR

The research proposes that the overseeing agency like the U.N, should propose the broad guidelines or the "envelope" of the hierarchy in accordance with acceptable global practices. A special care was taken for the laid down objectives to be acceptable to all the factions of the stakeholders represented by members of the core committee. A critique can surface about the involvement of religion such as "Sharia Law" as observed in Afghanistan recently, however,

the research chooses objectives for this illustration based on accepted global norms and practices which are not contrasting / conflicting with any religion. It is important to reiterate that the core committee is not confined or limited to these objectives, objectives may be added or deleted based on the specific set of conditions for a particular RRR effort. All the objectives are given equal weights initially. The relative weighting will be carried out by core committee supported by facilitators who will help achieve a consensus amongst the members of core committee. It is considered important to comment on the rationale of selecting the proposed objectives.

The core committee in a framework for RRR, can debate on the key aspects of delivering Justice through consensus building. In order to assign the relative weights to the five objectives discussed earlier, swing weight matrix was employed. While swing weighting is assumed, it may not be possible to conduct at the core committee level due to the need for consensus and the time required for elaborate discussions. It is the step where other methods of weighting may be applied and consensus approaches, including the use of hesitant fuzzy linguist, among other approaches, may be required at the top level of the core committee. It is, of course, recognized that the final weights are most probably going to be a political decision. The intent is to support those decisions with analysis. In order to extract preference from the members who are not conversant English language, the following steps were followed.

> **Step 4.1.1**: What is the least important objective between Establishment of Security, Provision of Justice, Creation of Economic Opportunities, Environment conducive for Education and efforts for Socio Economic Uplift.

All the members of the hypothetical core committee were directed to record their answer to the question. In case of a unanimous answer, it is easy to determine the least ranked objective. However, it is rare to find a unanimous answer, therefore, facilitators, open a round of

discussions where members are given an opportunity to deliberate the reasons for their respective choices. It is reiterated that consensus for this research means a two third majority. After a series of discussions, the core committee achieved consensus on choosing Efforts for the Socio Economic Uplift as the least important objective.

Step 4.1.2: What is the comparison of efforts for socio economic uplift with other four objectives? The following choices were put across the core committee.

(a) Equally important

(b) Twice as important

(c) Half as important

(d) Three times more important

(e) One third less important

(f) Any other value

In a similar manner, each member of the core committee was directed to record a choice for the each objective in terms of relative importance. The process is likely to consume a number of sessions and significant debate on the relative importance of each objective when measured against every other objective. The contrasting values and cultural preferences amongst the core committee members are likely to surface during this phase. Similarly, relative weighting for each objective is determined when compared with socio economic uplift effort. It is important to highlight that the "simple random sampling" commonly known as 100 ball technique (Meinck 2015) is proposed for the initial weighting of first tier objectives. The swing weight methods at this point is not proposed since the core committee is not cognizant of the selected measures and their range. Once the direct assessment through 100 ball technique is used, each objective will be referred to sub-committees and SMEs for selection of measures, relative weighting through swing weight technique. As a third step, the revised weights developed

through swing weight technique will then be presented to the core committee for formal approval before implementation.

Step 4.1.3: In this step, all remaining objectives are weighed against each other to determine the relative importance of five given objectives. After recording the preferences of each stake holders, the facilitators will engage the committee to achieve consensus on the objectives of the value hierarchy. In this illustrative case, the following weighting is assumed to be achieved after reaching a consensus by the core committee. All the weights sum to 1.

It is important to reiterate the hybrid weighting technique proposed for this research. The initial five objectives as proposed in this research are derived after examining the literary work on the subject (see table 12) and the facts on ground (SIGAR 2021, Asia foundation Survey, World Bank data *etc*). Direct weighting assessment or the 100 ball technique is used for weight allocation to these first tier objectives. Since at this point in the framework, the entire set of measures is not available and swing-weight weighting cannot be used. Once weighting is accorded to the five objectives, the next step is to construct the subsequent tiers of hierarchy. Sub committees composed of Subject Matter Experts (SME) are considered suitable for this process. These SMEs can also identify the appropriate measures, determine their range and then subsequently re-weight the entire hierarchy. The core committee as a next step will revisit the weighting strategy which is now adjusted with swing weights and achieve consensus on the modified weights.

Since the case study for this research is based on RRR effort in pre-withdraw Afghanistan, it is important to briefly highlight a few peculiar aspects from Afghanistan based on religion and Pashtunwali.

Relative Weights of Objectives

Objective	Importance	Weight
Socio Economic Uplift (SEU)	Least important	0.0909
Economic Opportunities	Twice important to SEU	0.1818
Education	Twice important to SEU	0.1818
Justice	Thrice as important to SEU	0.2727
Security	Thrice as important to SEU	0.2727
Sum	**1**	

Table 13 Relative weight of first tier objectives

Establishment of Rule of Law and Justice

Provision of timely justice remains an essential ingredient for any society to function. Islam as a religion also stresses the importance of justice like any other religion. It should be noted that the case study country, Afghanistan, is a Muslim majority country with significant emphasis on religious practices. The point to elaborate remains the development of a value hierarchy that is conscious of local practices and culture. Therefore, relating the importance of Justice from the teachings of Islam is considered a valid line of argument for hierarchy development. In fact Islam, in its true spirit is not just a religion but also a code of life. Muslims believe that guidance in every aspect of life can be taken from dictates of "The Quran" and the sayings of Prophet Muhammad (PBUH) called "Sunnah". Justice holds a corner place in Islamic teachings "The Quran", the sacred scripture of Islam, considers justice to be a supreme virtue. It is a basic objective of Islam to the degree that it stands next in order of priority to belief in God's exclusive right to worship (*Tawheed*) and the truth of Muhammad's prophethood. God declares in the Quran:

"God commands justice and fair dealing..." (Quran 16:90). And in another passage:

"O you who believe, be upright for God, and (be) bearers of witness with justice!..." (Quran 5:8)

Therefore, justice is an obligation of Islam and injustice is forbidden. The centrality of justice to the Quranic value system is displayed by the following verse:

"We sent Our Messengers with clear signs and sent down with them the Book and the Measure in order to establish justice among the people…" (Quran 57:25)

Thus, inclusion of Justice shall not be a surprise for any member of the core committee. Justice is imperative for any society to prosper, flourish and progress. In conflict ridden areas Justice often remains an aspect not available to the society and is an essential factor for the conflict to develop and sustain. Interestingly; Afghanistan, despite being a Muslim country where Islamic Law and the Quran finds much respect, still does not fully practice Sharia (Islamic) Law (Fearon, 2010). The preferred source amongst the doctrinal sources appears to be Pashtunwali, (which literally means the way of Pashtuns (Rzehak 2011)) but this can vary from case to case, district to district, so it is better to view the decision-making process as through a prism walled by Pashtunwali, Islam, local tradition and the formal justice sector. It will be pertinent to look at the present sources of Justice (both official and unofficial) available to a common Afghani. These are

1. The Afghan Government formal judicial system named Huquq Department (judges, prosecutors & other MOJ staff)
2. Afghan Government officials (usually District Governor [DG] and District Chief of Police [DCOP])
3. The Elders or the Jirga
4. The Mullahs / Talibans

Not only do these four justice providers regularly engage in dispute resolution by themselves, but it is also common to find more than one to be involved in any given dispute. The mullahs

in particular play at least an initial advisory role in many disputes that are resolved principally by all the other providers. For example, a group of village elders may ask for the assistance of the District Governor, or the DG may refer a case to the elders, or ask for the opinion of the Mullahs; or, the local prosecutor may refer a case to the local Elders and vice versa. Interestingly, the Talibans are the only group that works alone, without reference to the others and claim to follow Sharia law strictly.

Policing and Justice are the key requirements for any community. They are thus essential government service deliverables for any RRR effort to be successful. Therefore, any progress that can be made on these two issues will assist in bringing peace and stability to the region and hence contribute immensely for a successful RRR effort. The important aspect is to ensure swift and quick disposal of peoples' legitimate grievances. The core committee developed the hierarchy displayed in Figure 23 to improve the provision of justice in RRR effort for Afghanistan.

Accountability, is extremely important to establish the credibility of any government. The case of war lords in Afghanistan, the flourishing drug trade and blatant violations of human rights have gone unpunished in absence of any accountability laws and platform. At the same time, the claims of massive corruption during the Karzai and Ghani governments has contributed to the economic woes of Afghanistan despite trillions of dollars pouring in as foreign aid. Nick Grono, Deputy President of the International Crisis Group stated in 2011 that majority of Afghans still have no or little access to judicial institutions.

During a presentation at the Foreign and Commonwealth Office in London, he further said that Afghanistan faces political, accountability and the constitutional challenges to improve its judicial system (Grono 2011). The Netherland Institute of Multiple Democracy in a report published in August, 2021 highlighted that the legitimacy and credibility of the Afghan

government were undermined by corruption and fraud, enabled by an international community which all too often turned a blind eye to the failings in the governments it helped create. The US-led coalition showed only half-hearted attempts to stem the growth of corruption, and failed to speak out against massive fraud in successive elections (Berman 2021) . This opened the way to the gradual erosion of the credibility and legitimacy of the Afghan administration. People did not have faith in the governments because of the massive corruption at all levels and the absence of a strong and credible judiciary means that custodians of public money are looting the resources without any check and balance.

Value Hierarchy for Justice

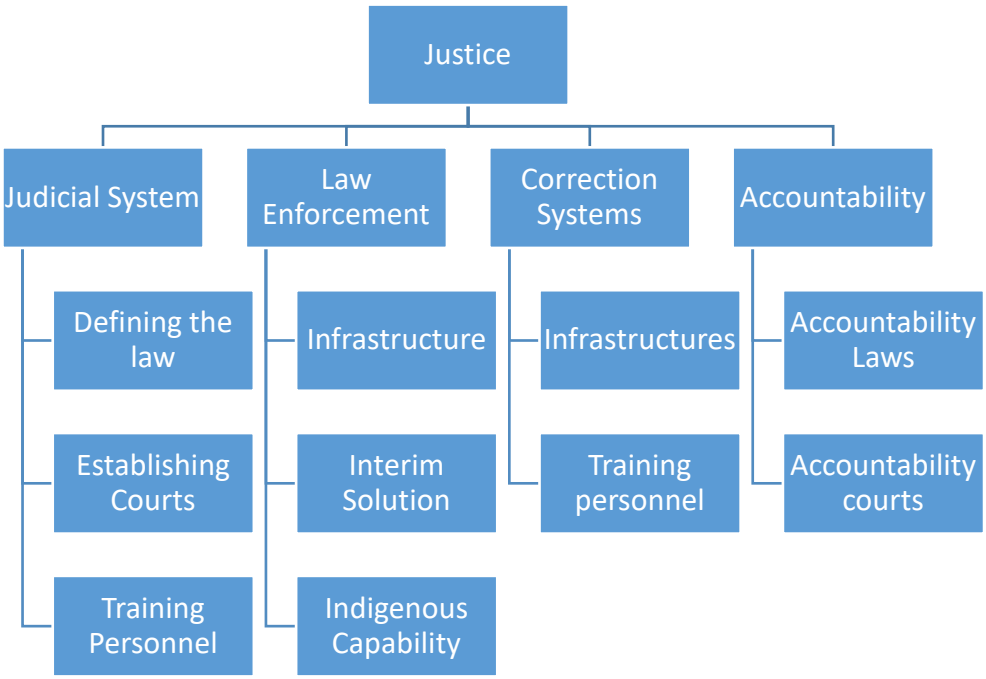


Figure 23 Value Hierarchy for Justice

- Therefore, an accountability system must be established which addresses all appeals in a swift and transparent manner. In this notional example, the core committee in order to bring Justice to Afghanistan achieved consensus on the hierarchy displayed in Figure 23.
- While defining the Law to be followed uniformly across the country is important, establishing courts that cater to the needs of the people and training the court personnel are

listed as key areas to revive the judicial system. The success in these areas can be measured through deciding the number of courts presently available in a developed country like Malaysia and comparing the ratio available in Afghanistan. Similarly, the number of personnel available at such courts can be compared in a similar manner. In order to measure the implementation of the same law right across the country, data can be collected and an attribute can be defined to grade success in this field.

Judicial System

Currently, Afghanistan does not have a uniform legal system. Serious human rights abuses continue to occur on a regular basis and many of the perpetrators remain outside the reach of government. The legal reality is marked by impunity; not only do past grave violations of human rights remain unpunished but such abuses are continuing without any immediate prospect for a legal system capable of bringing the perpetrators to justice. Therefore, to address the grievances of people and ensure security and stability, the hypothetical core committee agreed through consensus that a legal system is an absolute must at the earliest. The opinion about dispute resolution (Asia Foundation 2019) are displayed in Figure 24.

OPINIONS ABOUT DISPUTE RESOLUTION INSTITUTIONS

	HUQUQ DEPARTMENT	STATE COURT	LOCAL SHURA/JIRGA
	%	%	%
FAIR AND TRUSTED	73	66	81
FOLLOWS NORMS OF THE PEOPLE	63	57	74
EFFECTIVE AT DELIVERING JUSTICE	62	53	74
RESOLVES CASES QUICKLY AND EFFICIENTLY	54	47	73

Figure 24 Dispute Resolution Perception (Asia Foundation, Afghanistan Survey 2019)

The sub- hierarchy to determine values for establishing a legal system are explained in the following paragraphs.

Defining the Law In order to sustain and flourish, every society needs a judicial system. According to the Bonn Agreement of 2001 (UN Security Council 2001), the courts need to follow the 1964 Constitution of Afghanistan. However, as mentioned in an international Commission of Jurists report on Afghanistan's Legal System and its compatibility with International Human Rights Standards (Lau 2003), the practice by courts is totally in contrast as to what was agreed in Bonn; the state laws are only applied in Kabul and Mazar e Sharif at the time of writing the report. The situation is even worse today.

> *"The contrast between the requirements to be met by Afghanistan's legal system under the provisions of the Bonn Agreement and the legal reality as it pertains in the country can only be described as dramatic: whereas the provisions of the 1964 Constitution and Afghanistan's international legal obligations can be ascertained without any difficulty, the same does not apply to the existing laws and regulations. The latter have to a large extent physically disappeared and can only be located in foreign libraries and collections. Thus both the Interim Administration and the Transitional Government, which took control over the affairs of the state in June 2002, having been elected by an Emergency Loya Jirgah, are faced with the impossible task of enforcing a legal system that within Afghanistan does not even exist on paper"* (Lau 2003).

At the same time, even if the 1964 constitution is implemented, the human rights standards mentioned there fall short of meeting international standards (Lau 2003). Therefore, the need to redefine the judicial laws in Afghanistan is imperative. The core committee chose a discrete measure for this value. An approved constitution from the parliament was viewed as a perfect score, whereas an interim law that is declared and followed by any interim government was given a score of 0.6. The current status in Afghanistan was given a score of 0.10. The SDVF is displayed in Figure 25.

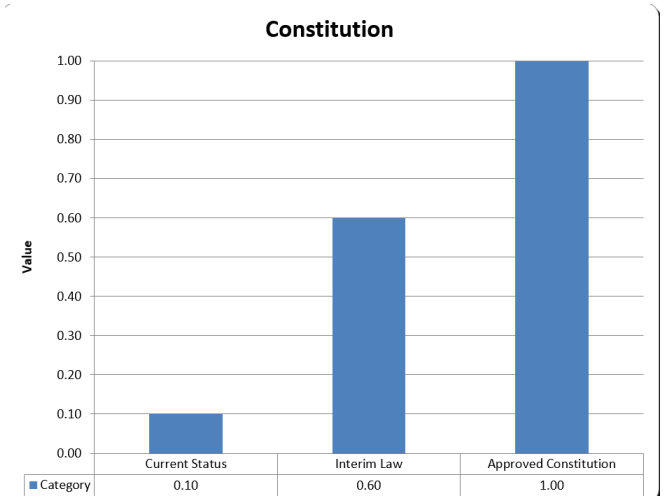


Figure 25 SDVF for Constitution

Establishing Courts The next logical steps to revive the judicial system are establishing and reviving courts at the district level and manning them adequately with professionally trained people. It is appropriate to comment that a large number of Afghans do not believe in fairness of the Governmental Judicial system and would like Jirgas or Taliban to administer justice to them. The Asia Foundation Survey 2018 in Afghanistan asked a similar question regarding satisfaction of the masses for dispute resolution services. It is not impressive to see that since 2007 the percentage has hovered around 20%. The results are displayed in Figure 26 (The Asia Foundation 2019).

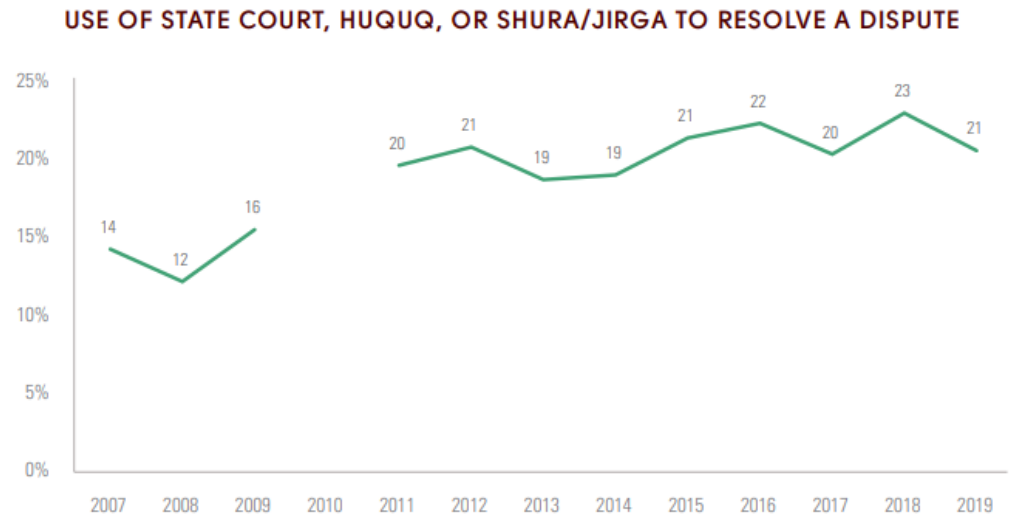


Figure 26 Use of State Institutions to Solve a Dispute (Asia Foundation 2019)

The Asia Foundation Survey asked Afghans about their opinion of the dispute-resolution institutions they used, the results are displayed in Figure 26. Similarly to previous years, Afghans have a great deal of confidence in local shuras / jirgas: 81.2% of Afghans say that local shuras/ jirgas are fair and trusted, 74.4% say they follow local norms and values, 74.2% say they are effective at delivering justice, and 73.2% say local shuras/jirgas resolve cases quickly and efficiently—all much higher proportions than users of the Huquq Department or the state courts (Asia Foundation 2019). Supporting these findings, Supporting Access to Justice in Afghanistan (SAJA), an initiative of the International Development Law Organization, in its 2016 report highlights that only 23% of Afghanis used the formal justice system to settle disputes and amongst them less than half reported to have trust in the state courts (International Development Law Organization 2016). The core committee used a proxy measure to score the establishment of courts in Afghanistan.

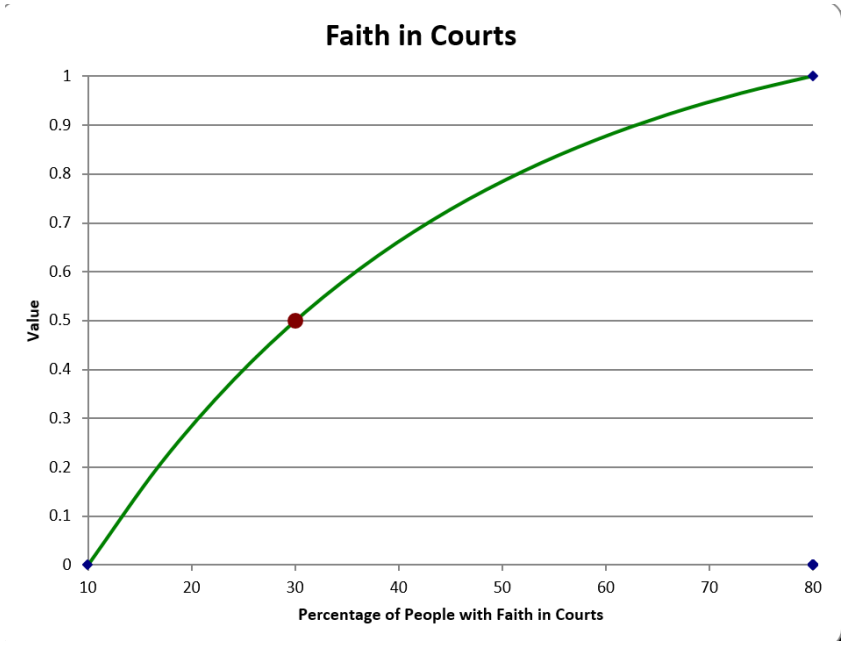


Figure 27 Percentage of People with Faith in Courts

The committee emphasized that while raising the number of courts is important, it is more important that people have faith in the courts for delivering justice. The present score of 10% of the people having faith in the courts was given a score of 0. A perfect score of 1 was given

to 80% or more of the people displaying faith in the courts in Afghanistan. The SDVF for this measure is displayed in Figure 27.

Trained Personnel for Judicial System

In order to deliver justice to the populace, trained personnel in adequate number was highlighted as an important value by the core committee. The personnel must be adept with the Sharia Law, local Jirga / Cultural law (Pashtunwali where applicable) and the fundamental international norms and practices customized according to Afghan tradition and culture. While establishing formal institutes to train personnel will take significant time, the conceptual framework is proposed in Figure 28. The measure to gauge effectiveness for this value was chosen as the time taken to resolve a dispute after it was reported. A 2019 report by the World Justice Project highlighted that for a common civil problem in Afghani courts, it took an average of 2.6 months for a solution (World Justice Project 2020). The type of cases whether simple or complex is not specified in the referred report, however, limited available sources in conflict-ridden countries is a reality that needs to be considered for analysis and conduct in RRR. The research assumes these cases to be minor and of simple nature.

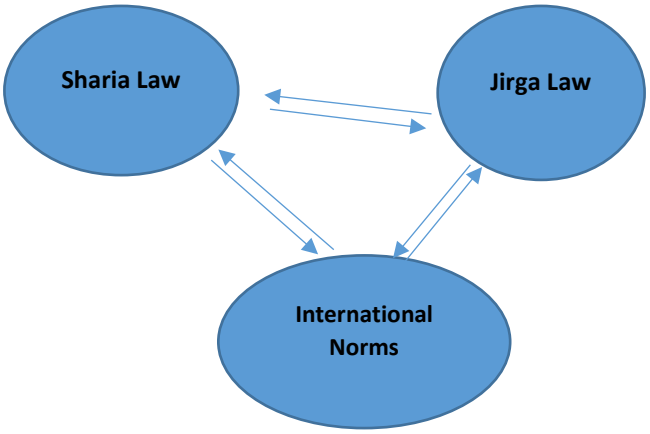


Figure 28 Interdependent Relation between Laws and International Practices

The core committee granted a score of 0.30 to 2.6 months. A perfect score of 1 will be given to 15 days whereas a 1 month time will fetch a score of 0.70. The SDVF is shown in Figure 29. At the same time, due representation to female judges must also be considered. After the fall of Kabul, around 270 female judges in Afghanistan have gone into hiding as reported by *NY Times* on Oct 22 2021[31].

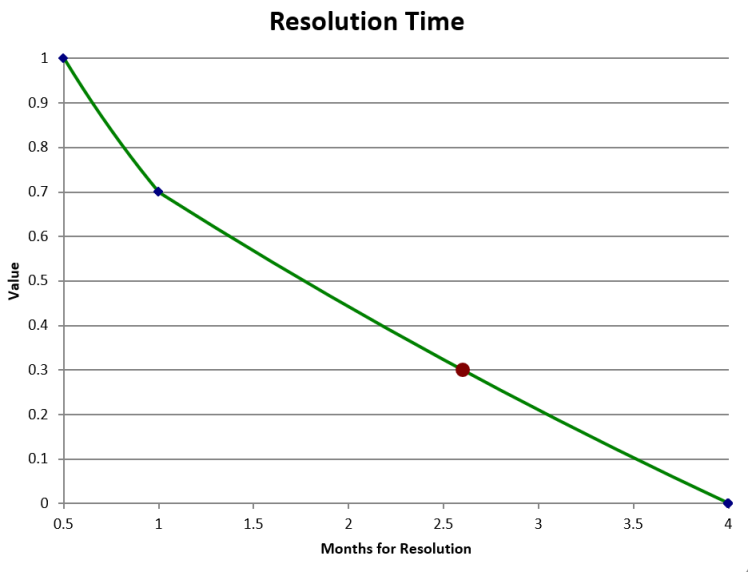


Figure 29 Resolution time for common civil disputes

Law Enforcement

The research finds that at present, the Afghani administration lacks the capability to enforce laws uniformly across Afghanistan. The hypothetical core committee stressed that law enforcement remained an important area that merited immediate improvement. It is also an area that would require significant foreign aid since a conflict-ridden country like Afghanistan in all likelihood will not have the resources to sustain an efficient police system (SIGAR 2019),

[31] https://www.nytimes.com/2021/10/21/world/asia/afghan-judges-women-taliban.html accessed 10 Nov,21

which has been highlighted as a high-risk area for the success of Afghan reconstruction by Special Inspector General for Afghan Reconstruction (SIGAR).

Law enforcement has further been divided into building the requisite infrastructure in terms of police stations and building an indigenous capacity to efficiently operate them. Since that may take time, the research proposes an interim solution where Law enforcement personnel are deployed from a Muslim country (an idea not accepted by Taliban once it was proposed by Turkey[32], however the dynamics were different as US had announced a withdrawal date). This would be far from ideal but is likely to create less ripples in the masses. However, indigenous capability to enforce state law is the ultimate sub objective for the core committee. The Infrastructure, that includes police station, equipment and training, is the next event on the priority list.

Infrastructure

The initial target set for Afghan National Police (ANP) was 86000 troops out of which 68000 was achieved by 2009 as highlighted in a United States Institute of Peace report by Robert Perito (Perito 2009). However, the report highlights that despite the impressive growth in numbers, the expenditure of $10 billion in international police assistance, and the involvement of the United States, the European Union, and multiple donors, the ANP is riddled with corruption and generally unable to protect Afghan citizens, control crime, or deal with the growing insurgency (Perito 2009). ANP was also termed as the "weak link in the security chain" by US Special Envoy, Richard Halbrooke while speaking in German Marshall Fund

[32] https://www.france24.com/en/asia-pacific/20210714-turkey-offers-help-securing-afghan-airport-but-has-erdogan-bitten-off-more-than-he-can-chew accessed 20 Oct,2021

Conference on 21 March, 2009. The Obama administration had planned to build more than 200 police stations in Afghanistan by 2013 that would have costed 600 Million USD[33].

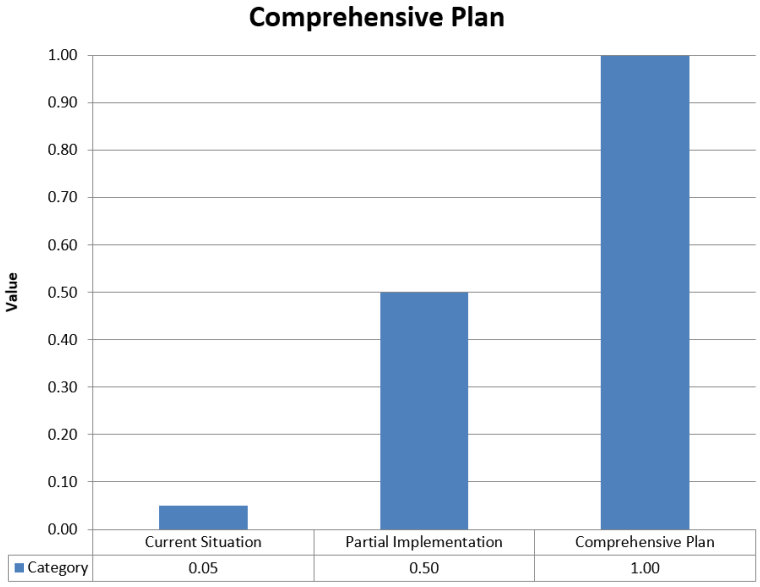


Figure 30 SDVF for Police Infrastructure

A SIGAR report highlights that as of March 31, 2019, the United States had obligated $4 billion and disbursed $3.9 billion of the Afghanistan Security Forces Fund (ASFF) from FY 2005 through FY 2018 appropriations for ANP (SIGAR 2019). The core committee was wary of "Ghost" police in Afghanistan and seriously viewed reports where SIGAR's special agents have been informed that portions of the ANDSF payroll process throughout Afghanistan have been manipulated to allow some former police officers to still be paid even though they have either resigned, been terminated, or been killed (SIGAR 2019). The measure selected to represent the value of infrastructure for the hierarchy was developing a comprehensive plan to develop a police system. The previous failed experiments of Afghan National Police and Afghan Local Police post the 9/11 incident, warrant that a system must be developed that

[33] http://www.mcclatchydc.com/2010/02/22/87404/us-spending-600-million-on-afghan.html accessed 15 Nov,21

considers the ethnicity, culture and sects of Afghanis being recruited. The hypothetical core committee agreed on a categorical proxy measure for the initial phase of RRR effort displayed in Figure 30.

Interim Solution

An interim solution for police with international assistance will always be required in any RRR effort with Afghanistan being no exception. An interim solution requires assistance from international players in terms of skilled human resource and financial assistance. The SDVF for interim solution is represented as the number of Afghans feeling comfortable about the security situation which is a proxy measure. The Asia Foundation survey in 2019 highlights that 38.7% of the interviewed Afghanis responded that they themselves provide the security (Asia Foundation 2019). This value was given a score of 0.15 by the core committee. The committee believed that while the perfect score will be when 100% of the people trust the Afghan police for the provision of security. A trust level of 75 % of the population expressing belief in Afghan police was scored a value of 0.5 by core committee. The SDVF is displayed in Figure 31.

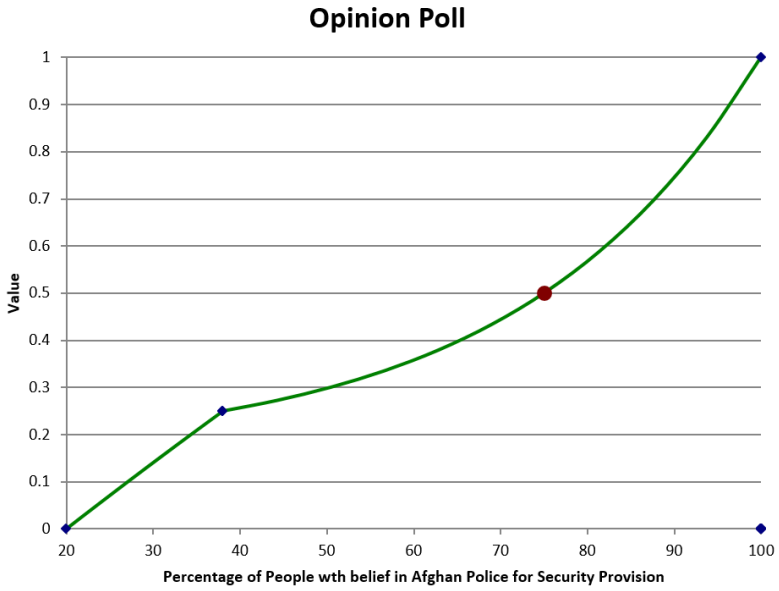


Figure 31 SDVF for Interim Solution

Indigenous Capacity

An indigenous, operational and mission capable police force is essential to bring stability and peace to a society and therefore is of paramount importance for the RRR effort. The development plans executed in Iraq and Afghanistan have demonstrated the likely pitfalls and identified challenges for any future RRR effort. While many measure qualify to represent this aspect, the core committee decided to select the crime rate as a measure to gauge effectiveness in places where indigenous police capacity is developed. The crime rate is calculated by dividing the total number of crimes by the total population (World Population Review 2022). This measure will highlight the effectiveness and quality of police force development. To highlight further, the crime index in Kabul during 2020 remained 76.76 making it the 12th ranked city in the world. Comparatively, Ankara, Turkey's capital which had a crime index of

39.91 and a rank of 226, Islamabad, capital of Pakistan, had a crime index of 29.19 rank 322 and Baghdad had a crime rate of 65.49 and a ranking of 37[34].

The SDVF of crime rate represents the effectiveness of police force. The core committee scored 0.15 for the crime rate of 76.76. Decreasing the crime rate to 60 will receive a score of 0.4 whereas if the crime rate drops to 45, it will be scored 0.75. The SDVF is displayed in Figure 32.

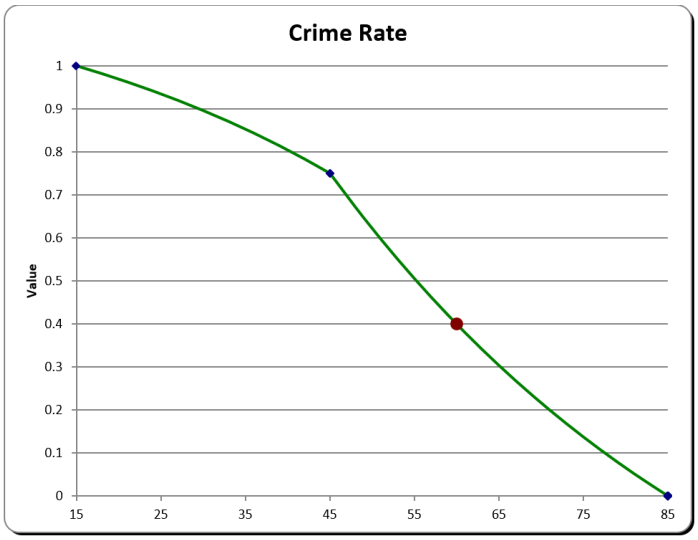


Figure 32 Crime rate SDVF for Kabul

Corrections System

Developing a corrections system, where criminals are molded into law-abiding citizens is essential for any RRR effort and so it is in Afghanistan. The private prisons owned by various warlords need to be abolished, new state run prisons must be developed and internationally accepted human rights must be practiced in such correction facilities. Adequate training and staffing is the way to develop this objective in a stable Afghanistan. The core committee further divided this value into two categories. Corrections infrastructure can be measured with the availability of jails whereas the personnel relates to the human resource that is trained to

[34] http://redbook.cc/en/stats/crime/kabul-afghanistan-crime-index-report/12 accessed 15 Nov,2021

effectively run these correction infrastructures. The world prison brief is a database that provides monthly data based on official figures. The figures from Afghanistan were last updated on 31 October, 2021 (Walmsley and World Prison Population List 2021). In 2017 there were approximately 30,000 prisoners listed for Afghanistan with a rate of 88 per 100,000 population. This rate was estimated to drop to 77 per 100,000 in 2021; however the situation on the ground has prevented collection of authentic data (Walmsley and World Prison Population List 2021). Unfortunately, the prison infrastructure has an occupancy level of 179.9% according to data collected in October 2018 (World Prison Brief data 2021). Prison capacity level was chosen as an indirect measure to measure the number of corrections personnel by the core committee. In 2021, there were 251 corrections facilities in Afghanistan including 34 provincial prisons, 187 district detention centers and 30 juvenile rehabilitation centers (World Prison Brief data 2021), these prison centers had a manning level of 30% of the approved manning (World Prison Brief data 2021). The manning level is considered as an appropriate measure to gauge the effectiveness of improving the corrections systems. The SDVFs for both measure are displayed in Figure 33. The x-axis on the prison capacity graph is incidentally beyond 100% as the prisons are filled beyond their capacity. Thus bringing the level down to 90% fetches a very high score in the consensus based value hierarchy.

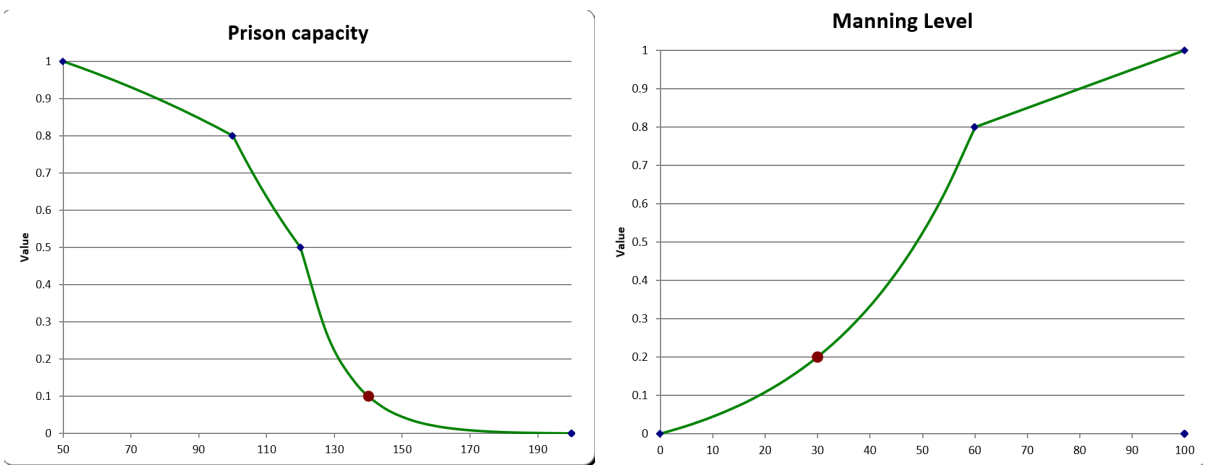


Figure 33 SDVFs for Corrections Infrastructure and Manning

Accountability

In a Congressional Research Service Report (CRS) titled "Afghanistan: Post-Taliban Governance, Security and US Policy", the author Kenneth Katzman states:-

> *"No matter how expansively the U.S. mission has been defined, building the capacity of and reforming Afghan governance particularly reducing governmental corruption have been consistently and widely judged to be key to the success of U.S. policy. This has been stated explicitly in each Obama Administration policy review, strategy statement, and report on progress in Afghanistan, as well as all major international conferences on Afghanistan, including the major conference in Bonn on December 5, 2011".* (Katzman, 2011)

Accountability is an aspect that merits immediate attention in Afghanistan. There are massive corruption allegations against the previous Governments of Afghanistan. Figure 34, derived from the Transparency International's Annual Corruption Perception Index (CPI), highlights the gradual improvement but is still far less than desired state of affairs in Afghanistan. Unfortunately, a common Afghani has to pay a bribe for their legal rights. Such practices are a key in dissuading people away from peace and cooperation. The reason for Taliban courts have gained importance is the failure to develop a functional state justice system in Afghanistan after 2001 (Jackson and Weigand 2020). Had it not been for this widespread failure to ensure access to justice for Afghans, Sharia courts arguably would not have been such a powerful asset for the Taliban. In 2006, just one-fifth of Afghans surveyed said they would approach a government court to resolve their disputes (Asia Foundation, 2006).

Rank	Country	2020	2019	2018	2017	2016	2015	2014	2013	2012
165	Burundi	**19**	19	17	22	20	21	20	21	19
165	Congo	**19**	19	19	21	20	23	23	22	26
165	Turkmenistan	**19**	19	20	19	22	18	17	17	17
165	Guinea Bissau	**19**	18	16	17	16	17	19	19	25
165	Afghanistan	**19**	16	16	15	15	11	12	8	8
170	Haiti	**18**	18	20	22	20	17	19	19	19
170	Democratic Republic of the Congo	**18**	18	20	21	21	22	22	22	21
170	Korea, North	**18**	17	14	17	12	8	8	8	8
173	Libya	**17**	18	17	17	14	16	18	15	21

Figure 34 Corruption Index Transparency International[35]

This improved over time, with nearly half of Afghans responding to the same annual survey saying they would use state courts in 2018 (Asia Foundation, 2018). Yet the 2018 survey still found that most Afghans regarded state justice as ineffectual, corrupt and difficult to access. The emergence of the Taliban and their initial support by the masses was an outcome of similar corrupt practices. According to a host of Afghanis surveyed after the early post-Taliban era, they were categorical in saying that though Taliban punishments were barbaric and harsh, at least they addressed issues and served Justice, which was appropriate according to them. Therefore, in order to develop credibility for the government, it is essential that a separate institution that addresses people's grievances and complaints against corrupt practices in a swift and efficient manner be established. This institution must have the jurisdiction to hold every Afghani citizen accountable for actions done against the state law. A 2011 survey shown in Figure 35 highlights the public opinion regarding corrupt practices amongst the government officials.

[35] https://www.transparency.org/en/cpi/2021/index/afg accessed 25 March,2022

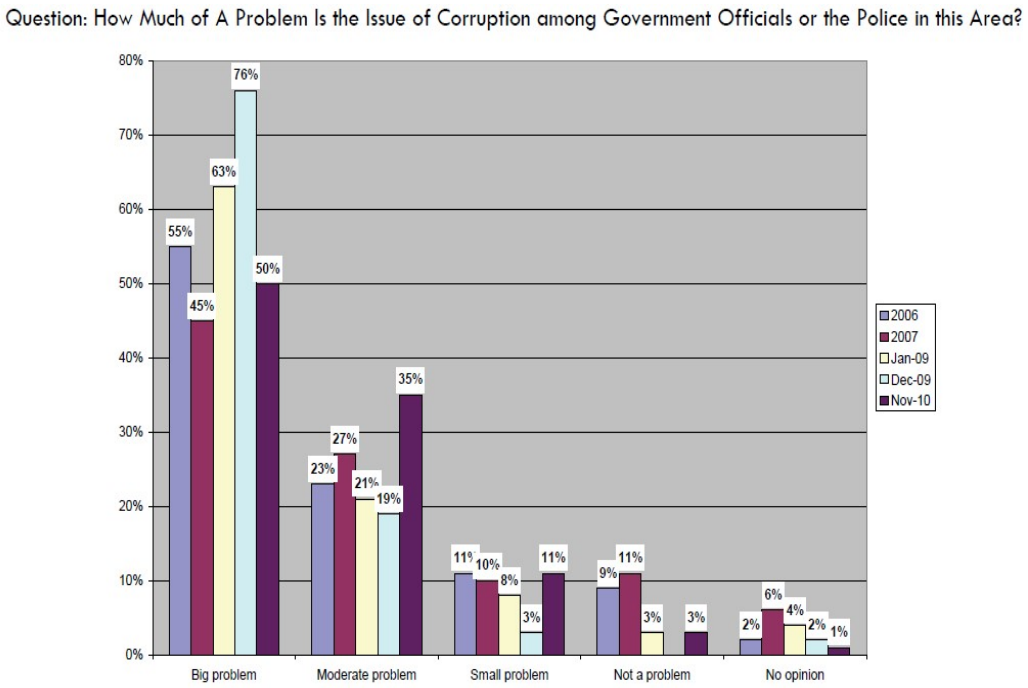


Figure 35 Problem of Corruption (Ian S Livingston, 2011)

Interestingly again, the problem seems to have been unresolved according to the Asia Foundation Survey 2019 as 67.9% of the surveyed Afghans still viewed corruption as a major problem (Asia Foundation 2019) as displayed in Figure 36.

The core committee identified formulating accountability laws and accountability courts to tackle the corrupt practices. The SDVF for the laws remain categorical. The core committee believes that the Afghan law of 2004 needs to be modified. It gives it a score of 0.10 to the existing laws, whereas drafting new laws that address the problem of corruption will be scored 1; an interim solution granted a score of 0.6 is to expeditiously frame an amendment to the existing law while keeping the Sharia, culture and international practices compliant.

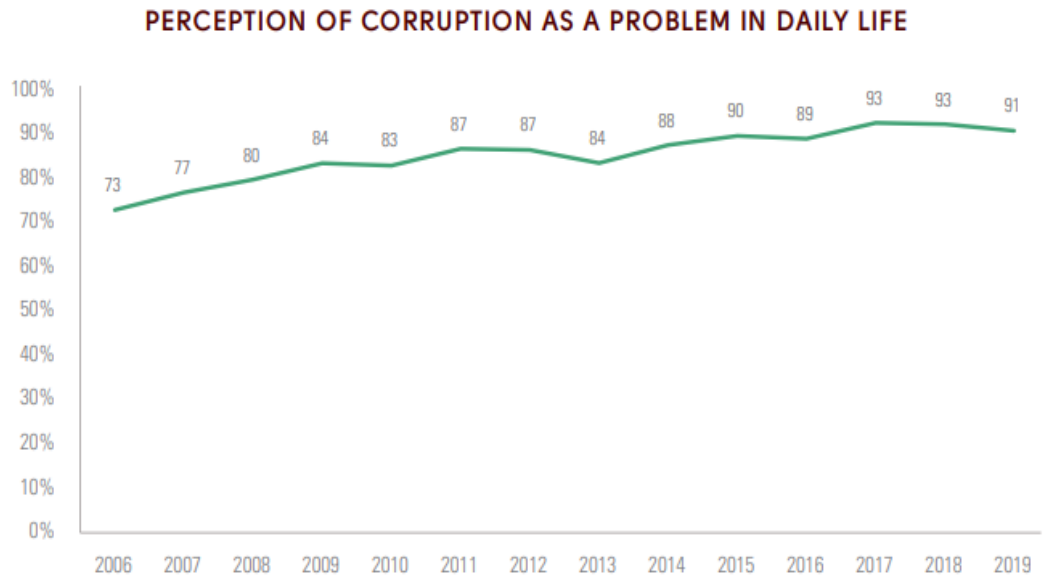


Figure 36 Perception of Corruption (Asia Foundation, Afghanistan Survey 2019)

Similarly, two accountability courts for every province is considered a bare minimum with an appeals court represented at the national level. It is important to highlight that Afghanistan has not witnessed any accountability program for corruption or crimes against humanity including war crimes. Figure 37 represents the SDVF for these aspects.

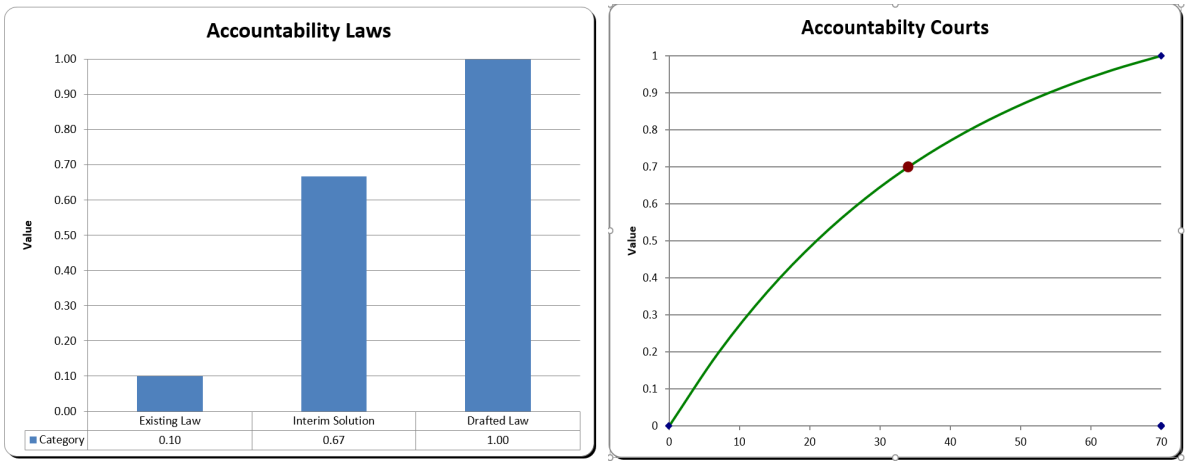


Figure 37 SDVF for Accountability Laws and Courts (At least 02 courts for 35 provinces represent 70 on x-axis)

The hypothetical core committee through consensus achieved the hierarchy for Justice Improvement as highlighted in Table 14.

Justice (0.273) Objective / *Measures*			
Judicial System (0.055)	**Law Enforcement (0.055)**	**Correction Systems (0.055)**	**Accountability (0.055)**
Defining the Law	**Infrastructure**	**Infrastructure**	**Accountability laws**
Approved Law	***Comprehensive implementable plan***	***Prison capacity***	***Accountability laws***
Establishing Courts	**Interim Solution**	**Training Personnel**	**Accountability courts**
Faith in Courts by locals	**Opinion by local people**	***Number of Prison staff /Manning level***	***Number of accountability courts***
Training Personnel	**Indigenous Capability**		
Resolution time	***Crime rate***		

Table 14 Justice Value Hierarchy

Improving Security

Security remains essential for peace to be stable and self-sustaining in any RRR effort and Afghanistan is no exception. Violence and insecurity continued at high levels across Afghanistan in 2019, with the Afghan National Defense and Security Forces (ANDSF) entrenched in conflict with the Taliban and other insurgent groups at that time. The Global Peace Index maintained by the Sydney based Institute for Economics and Peace (IEP) now lists Afghanistan as the least peaceful country in the world, replacing Syria (IEP 2019). The Asia Foundation survey notes that 35.9% of surveyed people highlighted insecurity / crime issues as their biggest problem (Asia Foundation 2019). Security is viewed as a major problem by the hypothetical core committee. Security was elicited a weight of 0.2727 by the core

committee, making it equal to justice and thrice as important as social well- being. The core committee believes that a concentrated effort on improving Justice and Security is essential to initiate and subsequently sustain a successful RRR effort.

The value hierarchy of Security as perceived by the core committee is displayed in Figure 38. The core committee identified three areas to focus on security improvement. Figure 38 highlights the security hierarchy as perceived by the core committee. The objectives of Public Safety, minimizing extremist threat and enhancing the military capacity were identified as key areas for focus in the security paradigm. Public Safety was subdivided into freedom from terrorism, secure business, safe travel and the ability to participate freely in daily life activities. It is worth mentioning that according to some members of the core committee, instead of freedom from terrorism, non-combatant casualties in Afghanistan was a better measure to gauge public safety. However the non-availability of authenticated data in this regard prevented this measure from being selected.

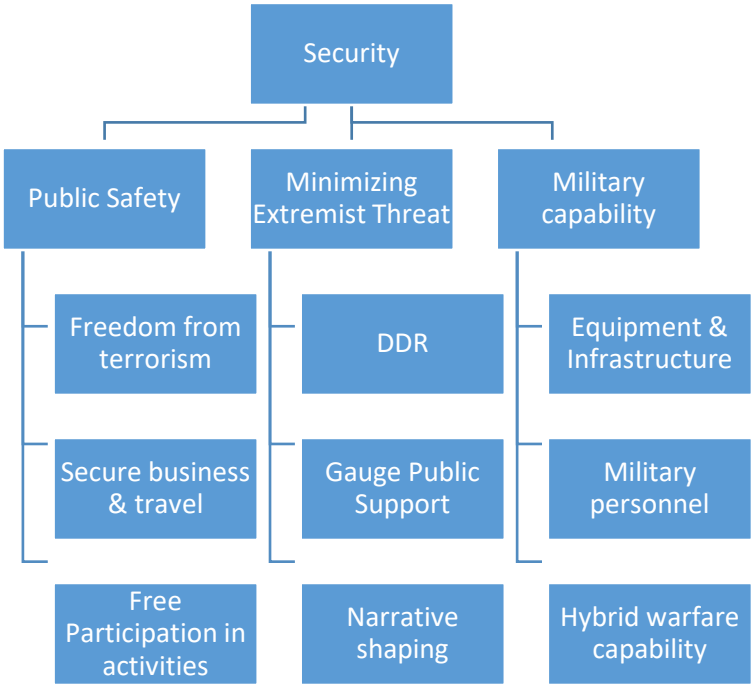


Figure 38 Security value hierarchy

The committee was satisfied with the selection of number of suicide / Improvised Explosive Device (IED) bombings as an alternate proxy measure to judge public safety. It will be pertinent to discuss the measures and the SDVF for these attributes separately.

Freedom from Terrorism. The number of Suicide / IED bombings conducted in Afghanistan is chosen as an indirect measure to represent freedom from terrorism. The collected data for past years is displayed in Figure 39. The committee agreed that the number of suicide bombings / IED bombings in Afghanistan is high, reducing these bombing to zero shall earn the perfect score of 1 for a SDVF. The committee, mentioned that anytime the number of suicide bombing were increased beyond 50 in one month, it shall be scored as zero. The notional core committee agreed that reducing the number to 18 will have a value of 50% or 0.5 in terms of freedom from terrorism for the Afghani people. The graph displaying an exponential curve representing the SDVF for suicide bombings is displayed in Figure 40 (a). For the purpose of the research, the data displayed in Figure 39 is used. The SDVF highlights that 1000 terrorist attacks in a year is given a score of 0.3 whereas any time these attacks increase beyond 1500 in a year they are scored zero. While eliminating all attacks may require a tremendous effort and seems unlikely, a perfect score was given when these attacks can be reduced to 200 in a year. The SDVF is displayed in Figure 40 (b).

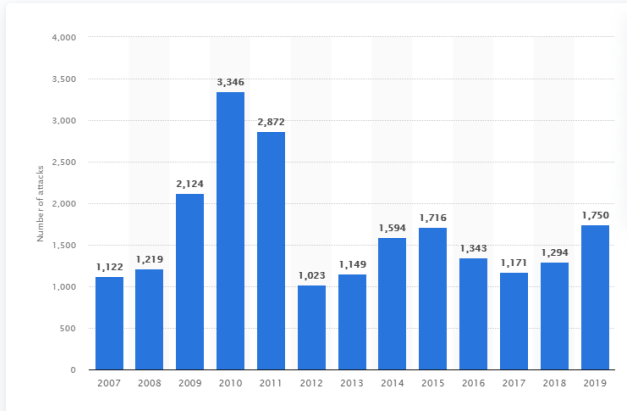


Figure 39 Terrorist attacks in Afghanistan over years[36]

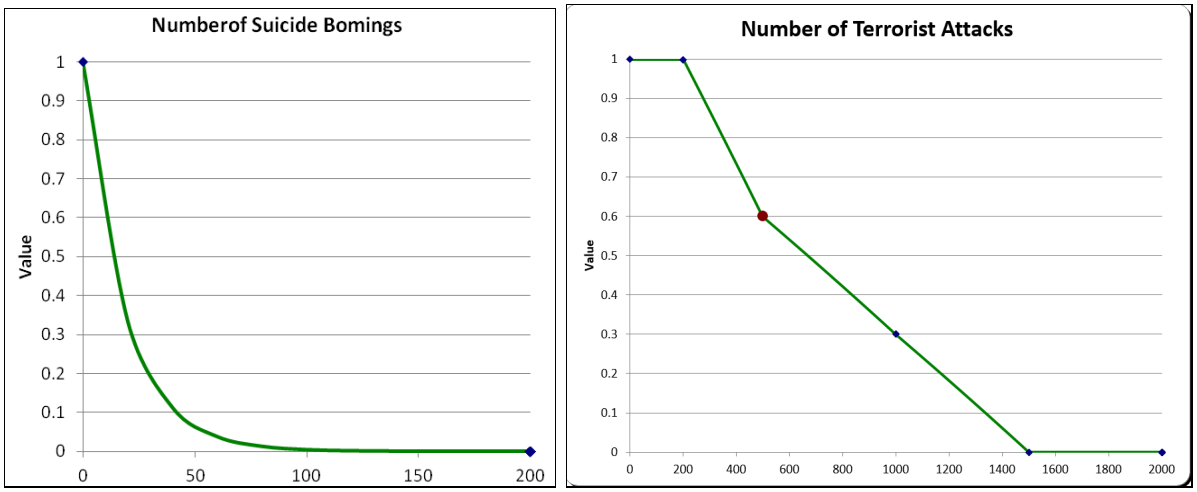


Figure 40 (a) SDVF for Suicide / IED Bombing (b) SDVF for Terrorist attacks

Secure Business and Safe Travel. This sub-objective was captured by selecting the number of people that fear for their life while conducting business and travel. The data gathered by Asia Foundations through yearly surveys is displayed in Figure 41.

[36] https://www.statista.com/statistics/250566/number-of-terrorist-attacks-in-afghanistan/ accessed 02 Nov,21

Figure 41 Fear for personal safety (Asia Foundation, Afghanistan Survey 2019)

The core committee suggested that a perfect score of 1 in this measure will be when 10% or less Afghans fear for their life while doing business and travel. The current percentage of 56% Afghans (Asia Foundation 2019) having this fear was given a score of 0.19 by the core committee. The SDVF of this measure is displayed in Figure 42. The different scores as suggested by the core committee were plotted and the Figure 42 reveals a relatively small gain in value till only 40% of the people fear for their life. However, there is a significant gain for the next 25 % that follows an exponential distribution and the value jumps from 0.25 to 0.75. The core committee noted that though the maximum benefit is achieved in the last 25% achieving that number can be focused on when other objectives in the hierarchy, like indigenous military capability and DDR, have seen notable progress.

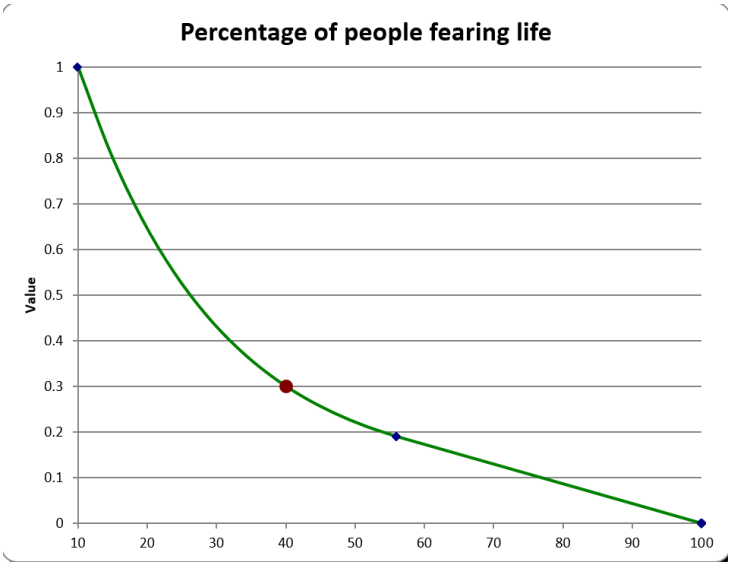


Figure 42 Percentage of people fearing life during travel & business

Active Participation in Activities Activities like voting, pursuing work and education for females are some of the restrictions that have been highlighted in Afghanistan. The core committee emphasized that no religion prevents the same basic rights for both men and women. Therefore, any future national structure in Afghanistan must ensure this aspect for global acceptability and recognition. Figure 40 represents the public opinion about women being able to vote. While it shows no drastic changes, the number of men out rightly refusing women's right to vote has decreased slightly (Asia Foundation 2019).

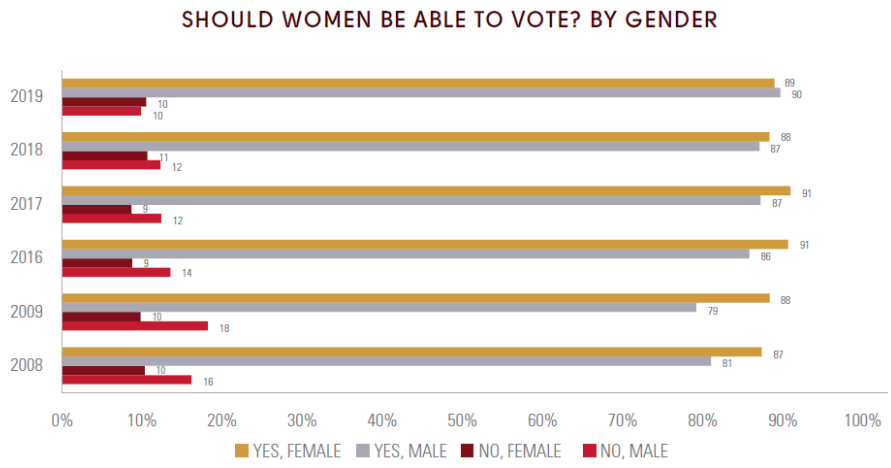


Figure 43 Female Voting Opinion (Asia Foundation, Afghanistan Survey 2019)

The SDVF represents the values of the core committee which is measured directly by analyzing women's ability to vote freely. The SDVF is displayed in Figure 44.

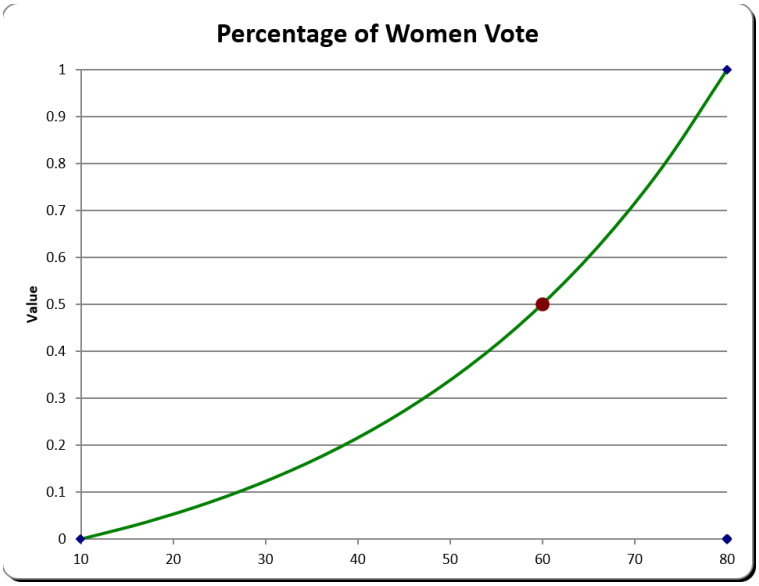


Figure 44 SDVF for Percentage of Female Voters

Minimizing Extremist Threat

The core committee stressed that Security in Afghanistan could only be achieved if the extremist threat to the Afghani people could be minimized. A more intrinsic approach where militant Afghanis could be persuaded through Religious Decree (Fatwa) to lay down arms and abstain from attacking the civilian unarmed population was stressed by the committee, this aspect was to be developed by narrative shaping. The core committee achieved consensus to mitigate extremist threat through an effective Disarmed Demobilized and Reintegrated (DDR) **campaign** which will help in achieving necessary public support for the RRR effort.

Number of Disarmed Demobilized and Reintegrated (DDR) personnel

DDR remains a central component of post-conflict stabilization efforts (Dobbins, Campbell and Zimmerman 2020). A 2011 survey by the Brooking Institute estimated

the presence of about 120,000 Afghans in possession of illegal weapons. These Afghanis were both insurgents belonging to different faction of militant groups and private armies kept by warlords and Drug Mafia in Afghanistan. However, this number has been revised to approximately 150,000 with 60,000 as active fighters and 90,000 as local militia (Giustozzi 2017). DDR remains a complex process, where immediate, short term and long term goals are pursued in stages. The core committee decided to initially pursue the immediate and short term goals and revisit the value hierarchy when these are achieved. The number of people joining the DDR process was proposed as a measure to gauge progress in this aspect. A perfect score of 1 could only be achieved if 90% of known combatants turned in their weapons and joined the DDR process. However, as of 2011, only 63380 Afghans have laid down their arms and joined the DDR process. This figure was scored a 0.33 according to the core committee. The SVDF for DDR process is shown in Figure 45.

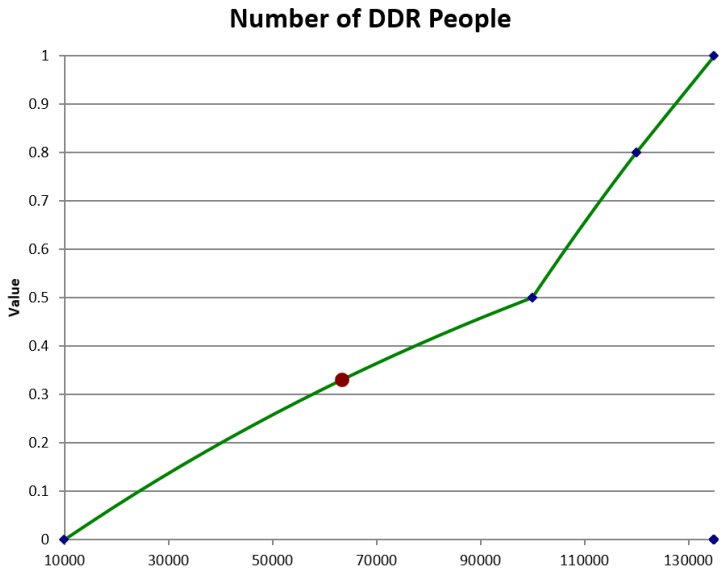


Figure 45 SDVF for DDR

Gauging Public Support

An appropriate measure to gauge extremist threat is considered to be the number of people supporting extremists like the Taliban in Afghanistan. The support is defined as occasional and can be monetary for the purpose of this research. The core committee, while deliberating the SDVF for this measure granted a score of 0.6 when 5% of public supports extremists. The SDVF for gauging public support is displayed in Figure 46. The support for the Taliban was 11% as highlighted by the Asia Foundation in 2011 survey (Asia Foundation 2011) and the 2019 survey highlighted that the number has slightly increased to 13.4% (Asia Foundation, Afghanistan Survey 2019).

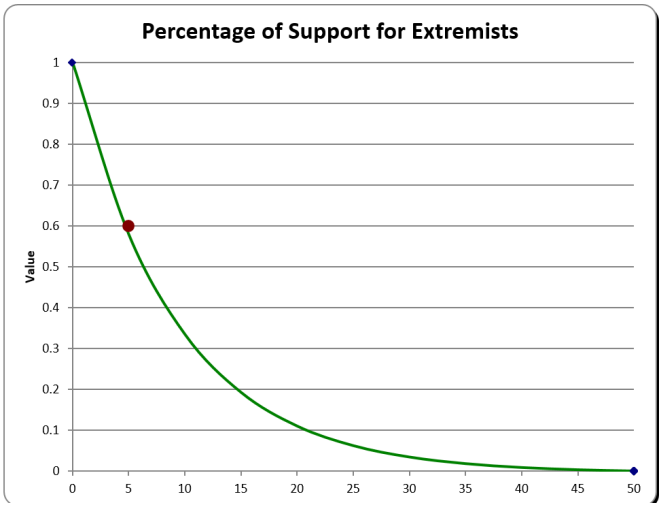


Figure 46 SDVF for Extremist Support

It should be noted that while the core committee chose to use the Asia Survey numbers, actual figures in Afghanistan, or any conflict region, are at best estimates. Whatever baseline is chosen, it is the relative change that is important rather than a specific number. As long as the measures are consistently taken and changes in survey methodology are noted and dealt with whatever respected figures are chosen for a conflict region should be acceptable if properly monitored.

Narrative Shaping An important aspect to emerge out of the current digital age[37] is "Narrative Shaping" as considered by the core committee. This aspect of communicating effectively with the local population is likely to contribute for betterment of security objective. Just as guerilla warfare, insurgency and hybrid warfare requires public support to thrive, a successful RRR effort requires the local population to effectively contribute. Developing a positive narrative in support of the entire RRR effort is therefore considered imperative by the core committee. Historically the optimism for peace rose steadily in Afghanistan from 2006 to 2013 and then declined. The reasons cited were growing insecurity, diminishing foreign aid, disputed presidential elections to name a few (Asia Foundation, Afghanistan Survey 2019). The national mood in 2019 survey conducted by Asia Foundation indicated that 36.1% Afghanis surveyed remained optimistic about the direction in which the country was heading as displayed in Figure 47 (Asia Foundation 2011).

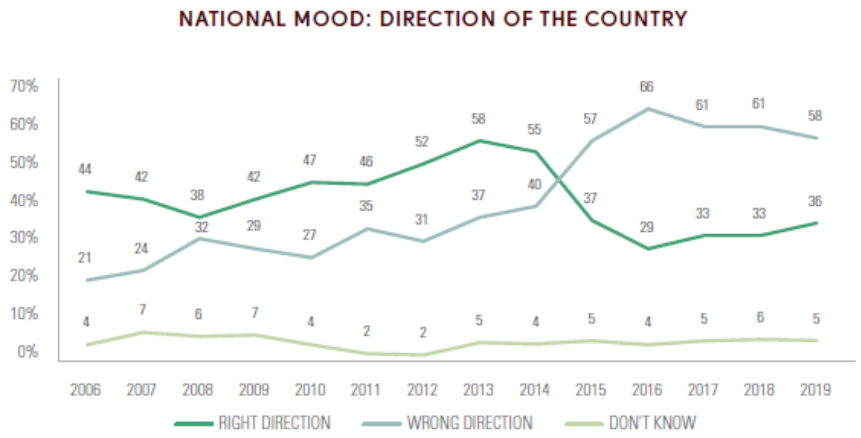


Figure 47 National mood for optimism in Afghanistan (Afghanistan Survey 2019)

Optimism about the future and RRR process is seen as an indirect measure to gauge effectiveness of the narrative The SDVF for narrative shaping is displayed in Figure

[37] https://dictionary.cambridge.org/us/dictionary/english/digital-age accessed 20 Dec,2021

48. The Asia Foundation survey highlights 36.1% of the surveyed people remain optimistic about the direction the country is going. The core committee while scoring this measure gave the 0.5 value score when 40% people are optimistic about future. The score of 0.8 is given when 65% people express optimism in the RRR effort.

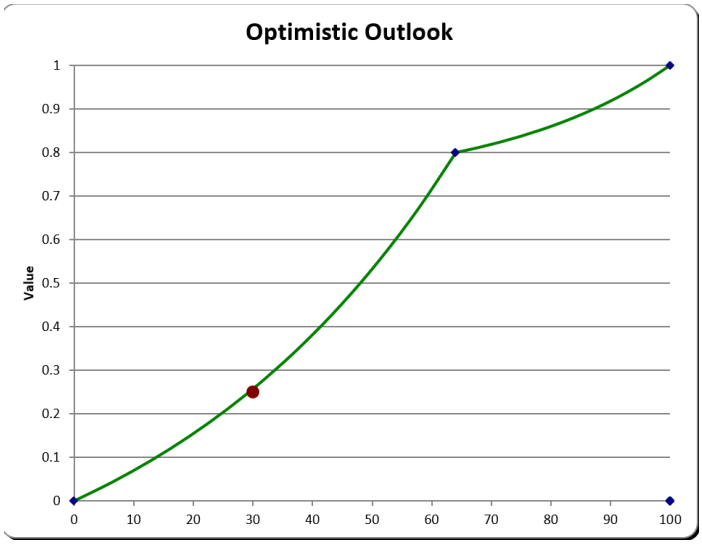


Figure 48 Optimistic Outlook by Afghans

Military

The third pillar to enhance security was the military as described by the core committee. Military was weighted twice as important when compared with Public Safety and Minimizing Extremist threat. The core committee pointed out that developing an effective, uncorrupted indigenous military strength and developing military infrastructure was twice as important as the capability to effectively identify and neutralize the threat emanating from hybrid warfare.

Indigenous Military Capability

Indigenous military capacity is extremely important to improve the security of a conflict torn country. The core committee agreed to select a direct measure of the number of operationally ready units for this value. The initial target was set at 100 units comprising of 500 personnel each. The core committee stressed that the value of initial 25% of

units being independent was far more than that of last 25%. As the number of operationally capable (ability to undertake stated mission objectives/ operations independently) units will increase, the quality of training and security will consequently improve. Figure 49 displays the concave curve for the independent Afghan Army units; a significant trade off value for the first 80 units is evident in Figure 49. In order to rank the value hierarchy, number of US trainers in Afghanistan was used as a proxy measure.

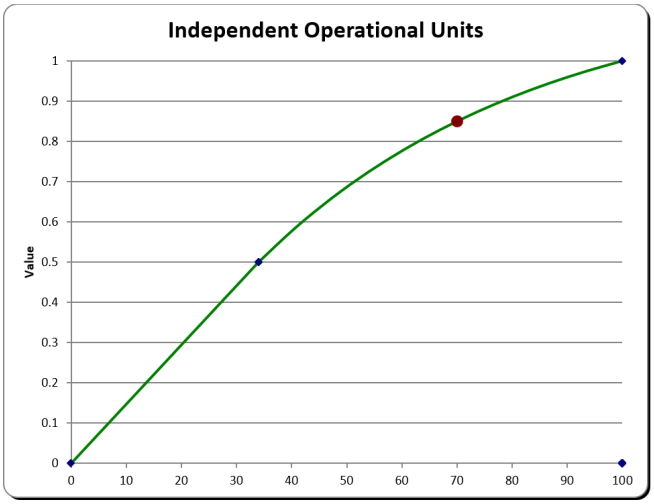


Figure 49 Number of Independent Operationally Capable Units

Military Infrastructure

The military infra-structure was captured by a proxy measure, which was the amount of per capita US Dollar, spent on military infrastructure. Counting the number of bases or facilities for this measure was ruled out since there will be many temporary bases built during RRR which will be interim in nature. The spending of 6.5 USD per capita was valued at 0.75 by the core committee. Since raising an army requires a significant amount of funding, consensus on budget allocation and its utilization remains a difficult aspect. Careful choice was thus made by the core committee for the initial period with an aim to re-visit the value hierarchy in due course of time. The SDVF is displayed in Figure 50.

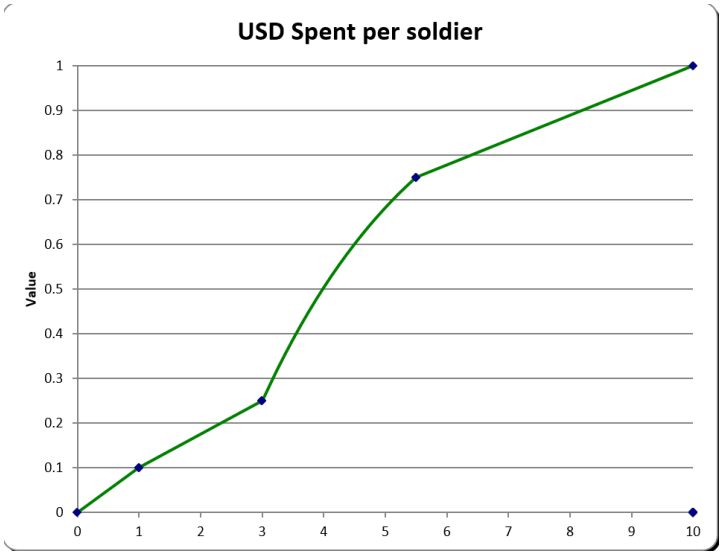


Figure 50 Spending for military infrastructure

Hybrid Warfare

Hybrid warfare and grey zone conflict remains one of the largest challenges to security in today's scenario. The RRR effort will surely be targeted by extremists to achieve sinister objectives. In an RRR effort, it is extremely important to establish a conceptual foundation for the contribution of defense forces to countering all hybrid challenges to national security (Monaghan 2019). In doing so, it takes the perspective of the role of defense within a wider, whole-of-government approach, where defense will play a distinct but varying role, subordinate to national strategy as highlighted by Sean Monaghan (Monaghan 2019). Figure 51 highlights the hybrid threats and warfare when measured against the conflict spectrum. An RRR effort is more likely to face intensity as highlighted by the red circle. The core committee emphasizes the importance of realizing the magnitude of threat posed by the hybrid threats and hybrid warfare. The core committee believes that while the narrative is being shaped, an effective strategy to counter the hybrid threat must be formulated. In order to judge the effectiveness of counter hybrid warfare strategy, a proxy measure is selected by the core committee.

The selected proxy measure gauges how the common people feel about their representation in RRR effort towards peace and reconciliation.

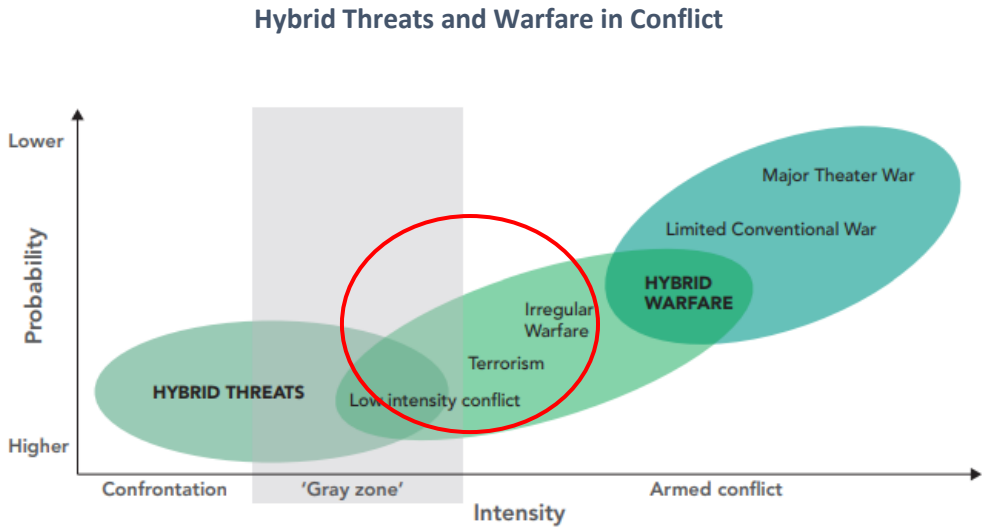


Figure 51 Hybrid Threats and Warfare in RRR effort adapted from (Monaghan 2019)

Since the research is based on an all-inclusive core committee, it is believed that if a common person in Afghanistan feels that he/ she is sufficiently represented in the committee, hybrid threats can be effectively countered. The SDVF for this measure is displayed in Figure 52. The core committee granted a score of 1 when 85% people believe that they are fully represented in the RRR effort, a 50% feeling of representation was scored as 0.6 by the core committee. In the absence of data prior to 2019 for peace talks, in order to evaluate the value hierarchy, a proxy measure of Perception about effectiveness of military forces was used. This perception may be measured by conducting a survey or even sentiment analysis. This research assumes surveys will be conducted to capture this measure. The SDVF for this measure is displayed in Figure 52 (b). It can be seen that the real gains are made when the positive perception registers a value between 50-70%, which would indicate an effective strategy against hybrid threats.

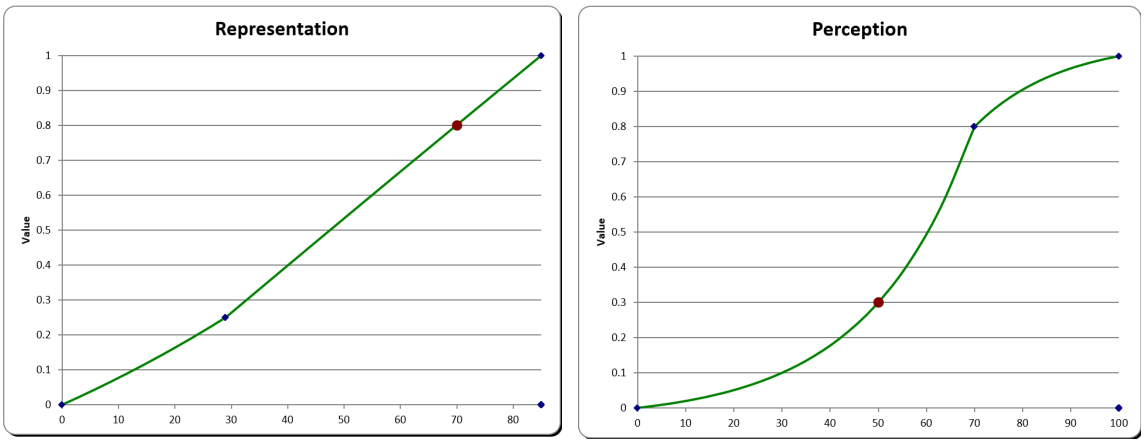


Figure 52 (a) Feeling of representation by common people (b) Perception about effectiveness of security forces

Similarly, the core committee defined SDVFs for improving education, economy and social wellbeing through consensus while being cognizant of local cultures and values. Educational processes in fragile states, such as Afghanistan, are marred with insecurity, violent attacks on schools. Corruption, and weak governance encompasses the educational institutions and socio-economic sectors in the surrounding political conflict (Pherali and Sahar 2018). It is important to highlight, that the evaluation measures used to rank various alternatives and hypothetical scenarios are collected through published data from authentic sources such as the World Bank, Asia Foundation, SIGAR and similar organizations wherever available.

The measures used in this notional example provide a vade mecum to building a value hierarchy for RRR based on pre-withdraw Afghanistan. They will need to be refined for other regions and cultures, but this section serves as a guide.

4.2 Results and Analyses

Alternative generation remains an integral part of VFT analysis. These alternatives can be ranked and the decision makers can find out the level that are met by the alternatives when compared to the laid down value hierarchy. For the purpose of this notional illustration, based on the data available, we were able to generate alternatives system states for the years 2007 2010, 2013, 2016 and 2019. In order to gain some insights on the likely effects of implementing strategies, hypothetical additional alternatives were created. These hypothetical alternatives focused on Security, enhanced foreign aid, an alternative that focused on improving security as the foreign aid is increased and an interdependent alternative where all the measures were altered based on the augmented foreign aid, improved security, justice and economic conditions.

The results based on real data (where available) obtained from internationally recognized sources like World Bank, Asia Foundation, RAND Corporation, United Nations are highlighted in Figure 53 & 54. It is not surprising to know that despite significant effort to rebuild Afghanistan by the international community, encouraging results are not witnessed based on the available data for years 2007 to 2019 as highlighted in Table 15. As evident, one can see a slightly better score during 2009-2013 when the focus was clearly on improving the conditions in Afghanistan. The deterioration in the subsequent years may be attribute to a diminishing focus and a corrupt government in Afghanistan, a reason that also finds a repeated mention in SIGAR reports (SIGAR 2019).

Ranking In Line of First Tier Objectives

Alternative Year	Score	Improved First Tier Objectives	Reduced First Tier Objectives	Remarks
2007 (Base line)	0.317			Baseline
2010	0.351	Justice, Socio Economic, Education, Economic	Security,	Maximum gain during the years in focus
2013	0.344	Security, Justice, Socio Economic, Education, Economic		Sustained momentum
2016	0.309	Justice, Education, Economic	Security, Socio Economic	Decline visible due to new government
2019	0.330	Justice, Education, Economic	Security, Socio Economic	Economic activity improved but security deterioted

Table 15 Rankings and first tier objectives

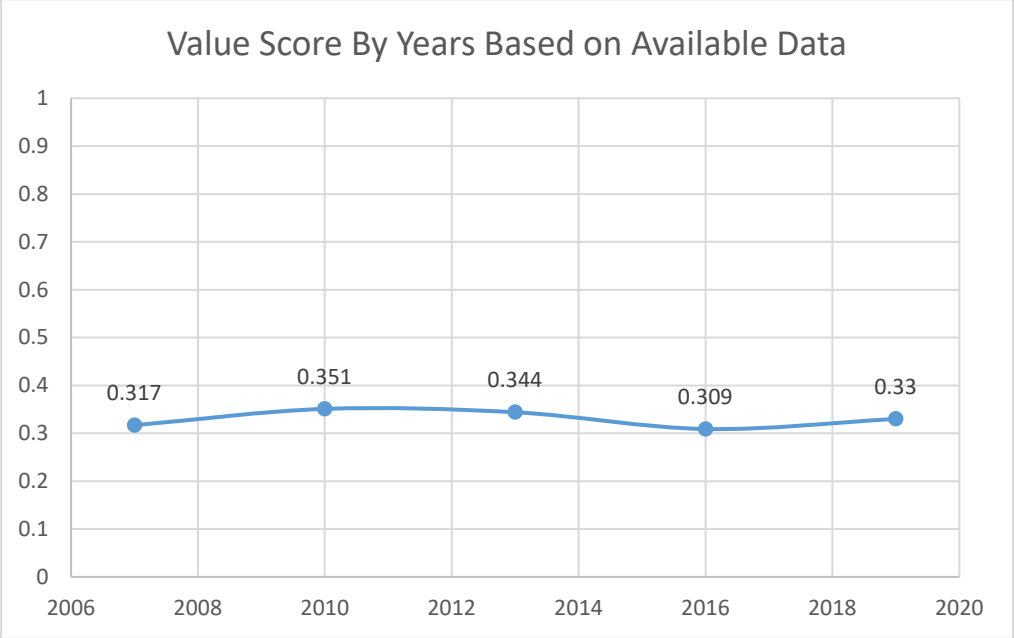


Figure 53 Relative scores of first tier objectives

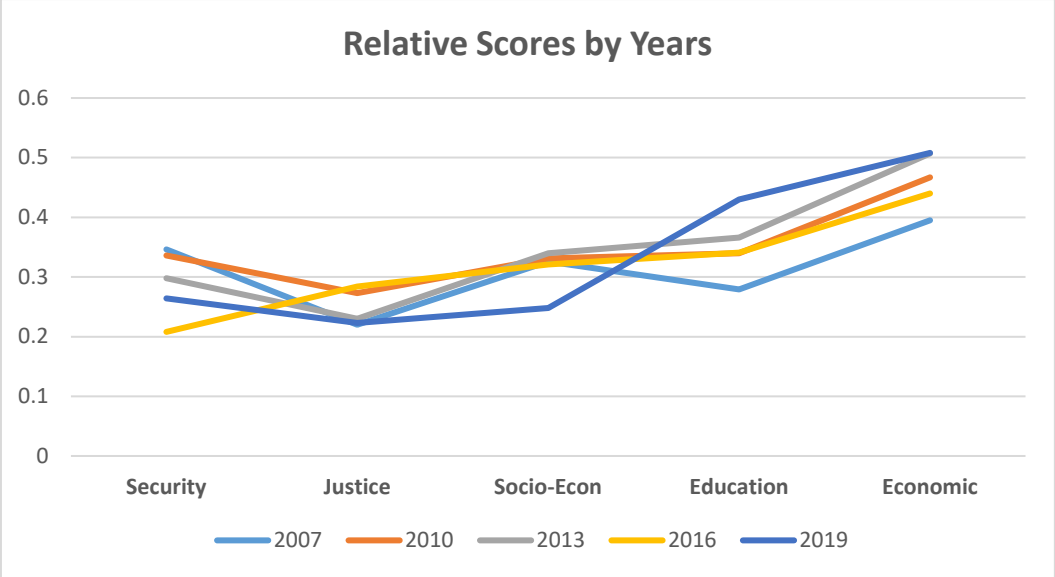


Figure 54 Relative scores of first tier objectives

To analyze further details, a ranking analysis was done based on the "security" objective of the hierarchy. The results are displayed in Figure 55 & 56. It is evident that with the increased number of international trainers and better spending budget for the security, the Afghan people were more optimistic about the improving situation which later diminished as the international agencies started to discuss withdrawal plans and curtail the budget spending.

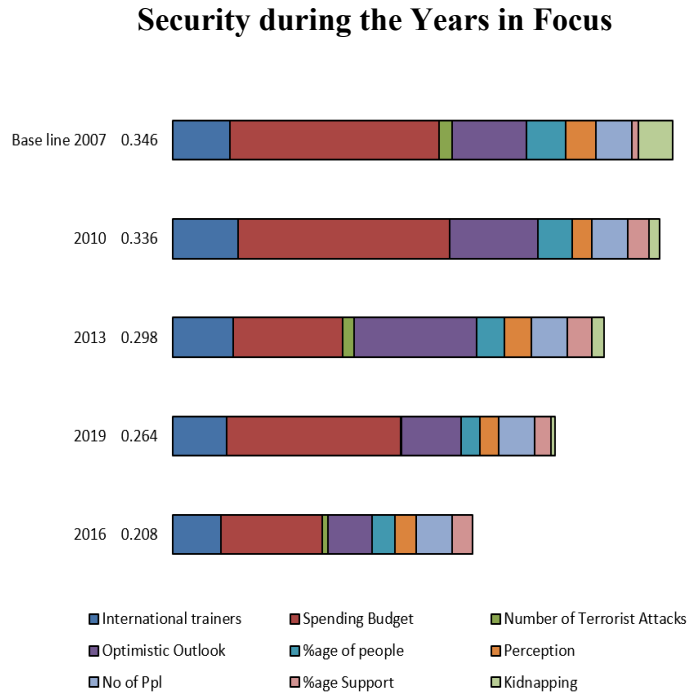


Figure 55 Ranking by Security Objective

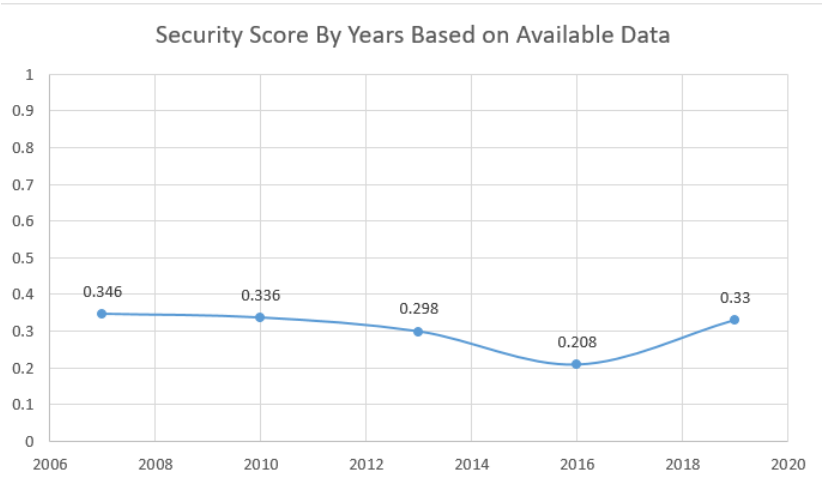


Figure 56 Security results over years

A closer look at the "Public Safety" sub objective within consensus based value hierarchy reveals the scores in this domain based on the available data. Figure 57 highlights the results and it can be seen that public safety was at its highest value in 2007 in light of values described by the hierarchy. In 2016, kidnapping was at its peak therefore scored a 0. Whereas the increased number of terrorist attack in 2010 and 2019 resulting in no contribution for the achievement of overall objective. This historical data can be useful to analyze the performance of each attribute and measure for course correction and remedial measures.

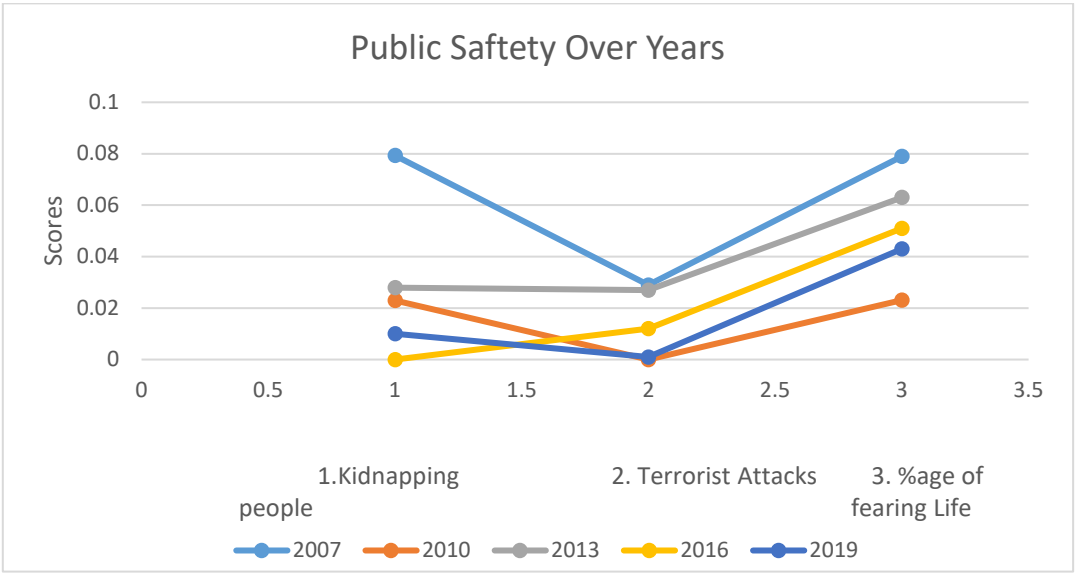
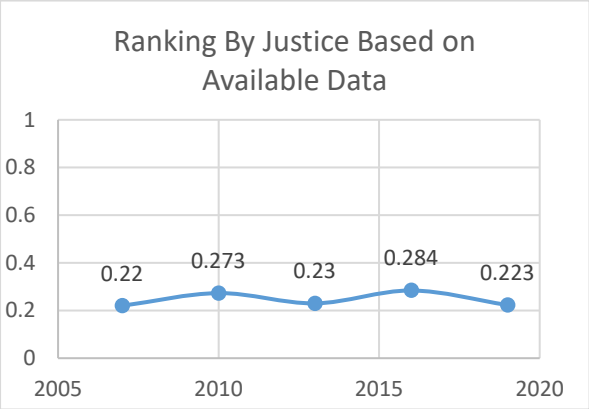


Figure 57 Public Safety over years

A similar insight can be developed for every objective, sub-objective and measures. There is a very gradual improvement in the "Justice" and "Socio economic" objectives for the years until 2016 and then after the second elections that brought Ashraf Ghani into power, the score in achieving that objective has also reduced according to the value hierarchy determined by the core committee. The results are displayed in Figure 58.



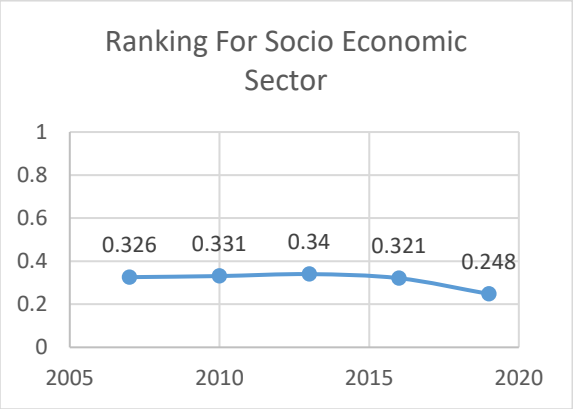


Figure 58 Ranking for Justice Ranking for Socio Economic Sector

In the education and economic sectors, one can find an improvement, however it is unlikely for this development to be sustainable in the absence of a regulated system of government in place. The rise in the education sector is primarily because of the increased number of universities in Afghanistan. These universities have mostly closed since the Taliban regime took over in August 2021. Similarly, the economic activity was hinging on foreign aids and grants which have significantly reduced since August 2021. Therefore, it will be safe to assume a further decline in both these metrics due to the ongoing political situation in Afghanistan. The results for both the objectives are displayed in Figure 59.

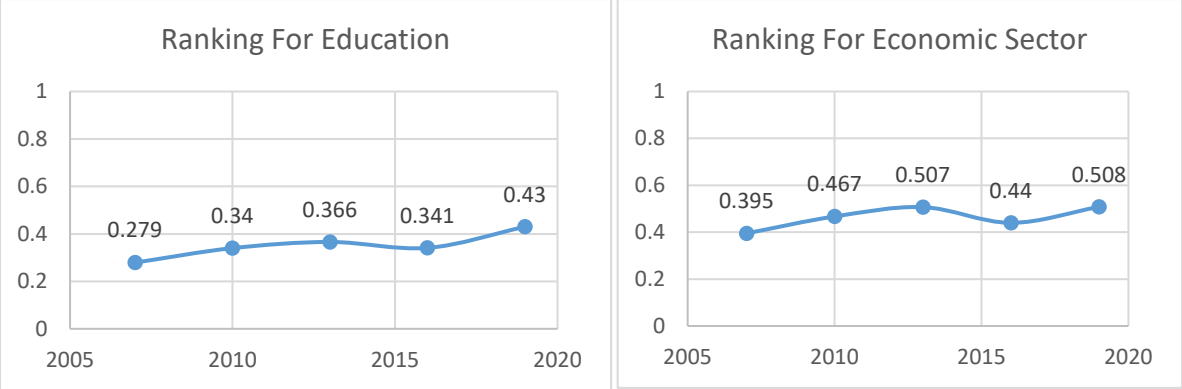


Figure 59 Education Sector Economic Sector

One of the advantages of suggesting a RRR framework through VFT, is to utilize its predictive aspect. A few hypothetical scenarios were generated to gain insights into the achievements that may be accomplished on focusing specific areas of the value hierarchy. The hypothetical scenarios are explained in subsequent paragraphs.

Enhanced Security Objective

The enhanced security is a hypothetical alternative that focuses on improving the security objective in a RRR effort. The weights are kept the same, but the data in various measures for the security aspect is hypothetically altered to gain insights and the impact it will have on the overall hierarchy. To explain further, the number of terrorist attacks, kidnapping and crimes are reduced. The military budget is enhanced by 25% and the number of people joining the DDR process is increased as a cascading effect along with the hope of optimism about the security situation in masses. The rationale for selecting a 25% increase is that Afghanistan does not currently have the capacity to absorb further increases as highlighted in "The lessons Learnt Program" by SIGAR (SIGAR 2019). The result as displayed in Figure 60 show an increase of about 13% of overall ranking while focusing on this objective when compared with results based on actual data in 2019. When compared to 2007, it is not really a significant gain when considering with the amount of time, effort and money spent to improve the security situation. However, the results match with the events that actually transpired in reality and offer an insight

on what may be accrued from focusing on security. However, the key to an enhanced security remains the international commitment both in terms of funds and skilled human resource as trainers. The scenario highlights the cascading effects of international commitments to improve security, which are perceived as less terrorist attacks, less number of people fearing life, secure businesses and travel to mention a few.

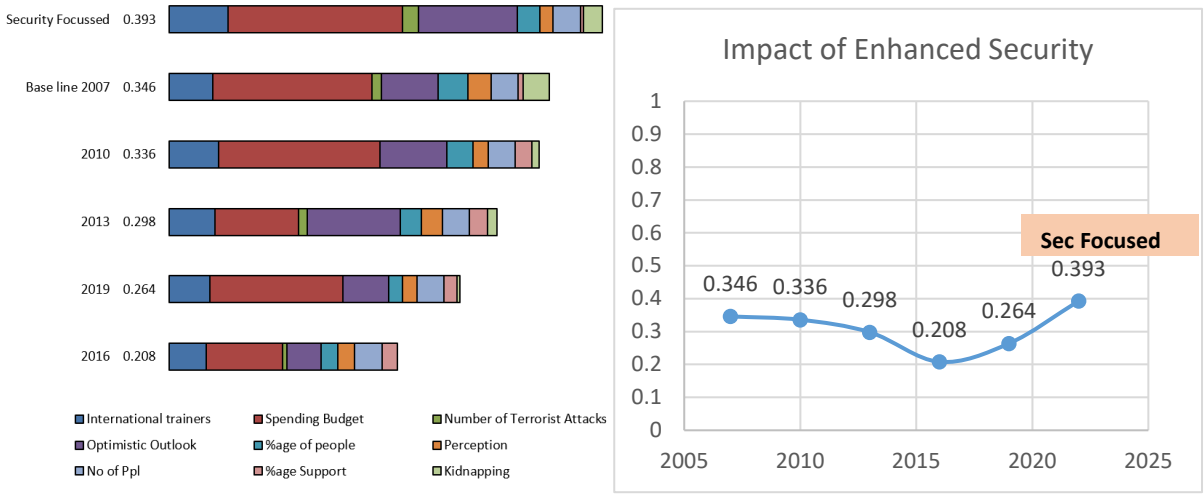


Figure 60 Security Focused Hypothetical Scenario

Enhanced Foreign Aid

An important aspect for any RRR scenario is the uninterrupted supply of economic assistance as promised by the donors. Since a conflict ridden country has a struggling economy, therefore it is imperative to keep the economic assistance channels open. Afghanistan has seen varying amounts of foreign aid from 2007 to 2019 ranging from 4.1 Billion USD in 2016 to 6.2 Billion USD in 2010. Figure 61 highlights the pledged versus the disbursed funds, which is considered significant. In hindsight, it highlights that funds must be released based on the absorption capacity of the recipient country. This mismatch aspect was highlighted as a contributory factor towards corruption in Afghanistan (SIGAR 2019). Similarly, it also stresses the need for a properly carved out long term implementation plan as proposed by this research.

A hypothetical scenario was generated where the foreign aid was considered 6 Billion USD and the 6.1 Billion USD debt (as of 2019) was reduced to 4 Billion USD. The rationale remains the capacity of the Afghan infrastructure, as it has witnessed that extra money eventually ends up with warlords and corrupt mafia, a fact stressed by SIGAR in its 2021 report (SIGAR, What We Need To Learn: Lessons from 20 year of Afghanistan Reconstruction 2021). No other changes were made to the data for the sole reason of analyzing the effects of foreign aid based on the current weights as perceived by the core committee. The results are displayed in Figure 62. The score of this hypothetical aspect is 0.360 which is a close second to the hypothetical scenario of enhanced security.

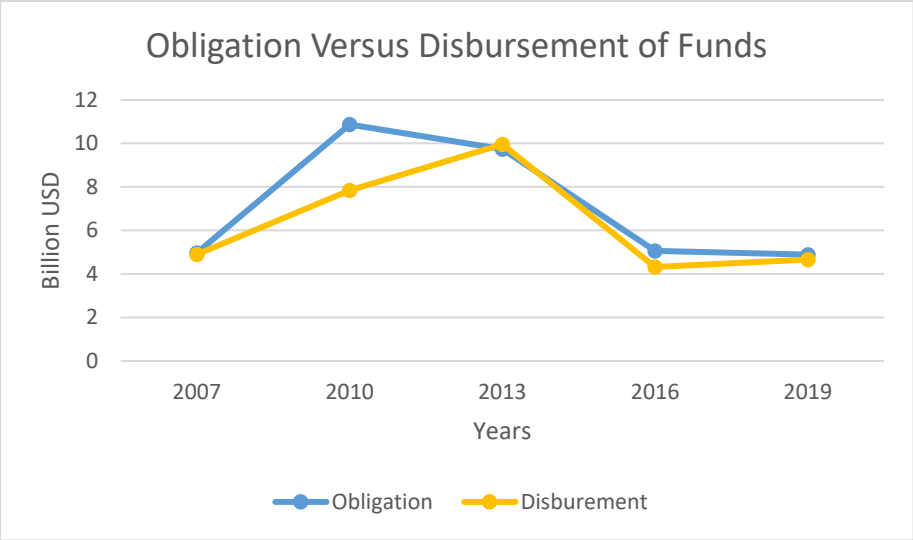


Figure 61 Pledged versus Disbursed Funds[38]

The results are not surprising as economic aid carries 60% of the local weight within the economic objective. The core committee can revisit the weighting strategy and might decide to adjust them after the initial requirements are met. The case is supplemented by the facts on ground in Afghanistan today, Afghans are facing a harsh winter with prospects of famine and

[38] https://foreignassistance.gov/cd/afghanistan/2007/obligations/0 accessed 25 March,2022

healthcare issues. The UN and its partners have launched a 5 Billion USD funding appeal[39] to help shore up the collapsing basic services there.

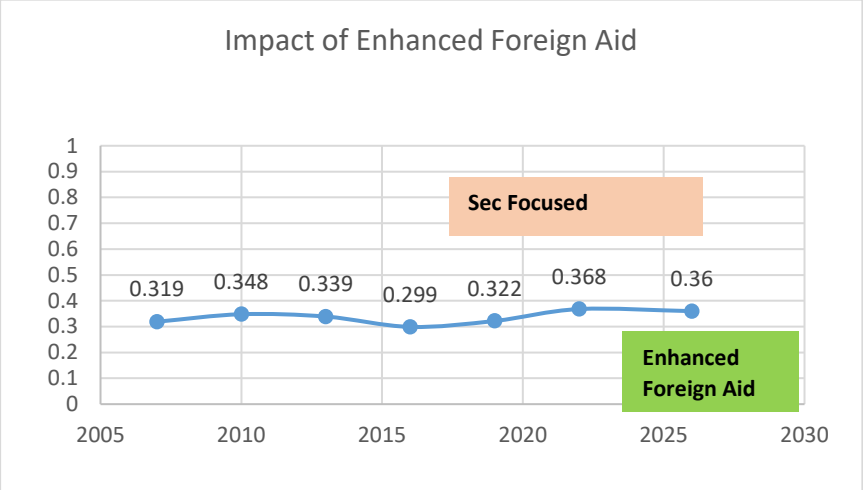


Figure 62 Hypothetical scenario with Enhanced Foreign Aid

Security Focused with Enhanced Foreign Aid Alternative

Another alternative was generated which augmented the efforts to improve security while enhancing the foreign aid. This alternative was highlighted as the initial focus area of the core committee where the first six months may be focused on improving the security conditions to subsequently make it easier to implement the RRR framework. The results from this alternative highlight a score of 0.409, which is better than all other alternatives. Figure 62 displays the results.

39 https://news.un.org/en/story/2022/01/1109492#:~:text=The%20UN%20and%20partners%20launched,requiring%20help%20beyond%20its%20borders. Accessed 18 Jan, 22

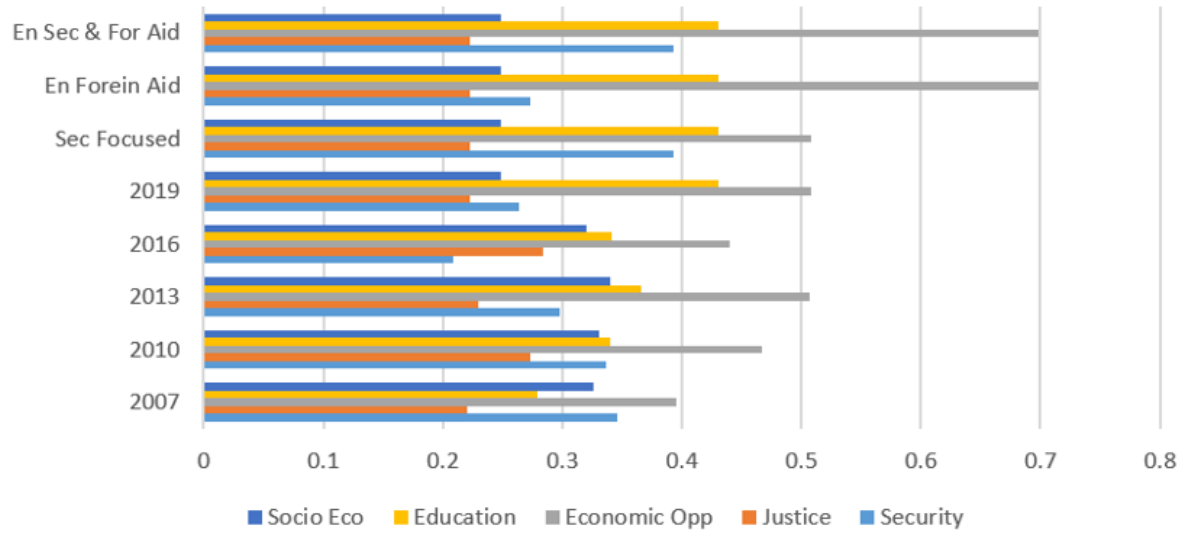


Figure 63 Hypothetical alternative with enhanced Security & Foreign aid

Interdependent Alternative

Another hypothetical alternative was generated that had a prime change in the Security values where the number of terror attacks, kidnapping, and people fearing for their life reduced. At the same time the spending budget and other factors were kept at the same level. In the justice domain, changes were proposed for favorable public opinion, faith in courts and crime rate with all of these measures improved by 10%. On the economic front, the foreign debt was kept the same as other hypothetical alternatives with foreign funding kept at the same level as for security focused alternative which is a shade lower than the funds received by Afghanistan in 2019 ($4 billion compared to $4.4 billion). The measures related to education also improved by 5-10% in terms of enrollment but the number of universities dropped to 80 instead of 94, which was the number in 2019. Figure 64 highlights the achieved results.

The results highlight the relative results for the first tier objectives when viewed in relation to each other. It is interesting to point out that while the “Interdependent” remains dominant in the overall results, it actually needs to improve in the Justice and Socio economic sector. This

can be an important insight for the core committee, where improving Justice and socio economic conditions highlight an area that requires definite improvement. The problem can also be approached as a Goal Programming model , where the hypothetical core committee decides a predetermined goal in a certain objective that is set as target for achievement as highlighted by Neely *et al* (Neely, Sellers and North 1980) in their 1980 article pertaining to multiple objective analysis.

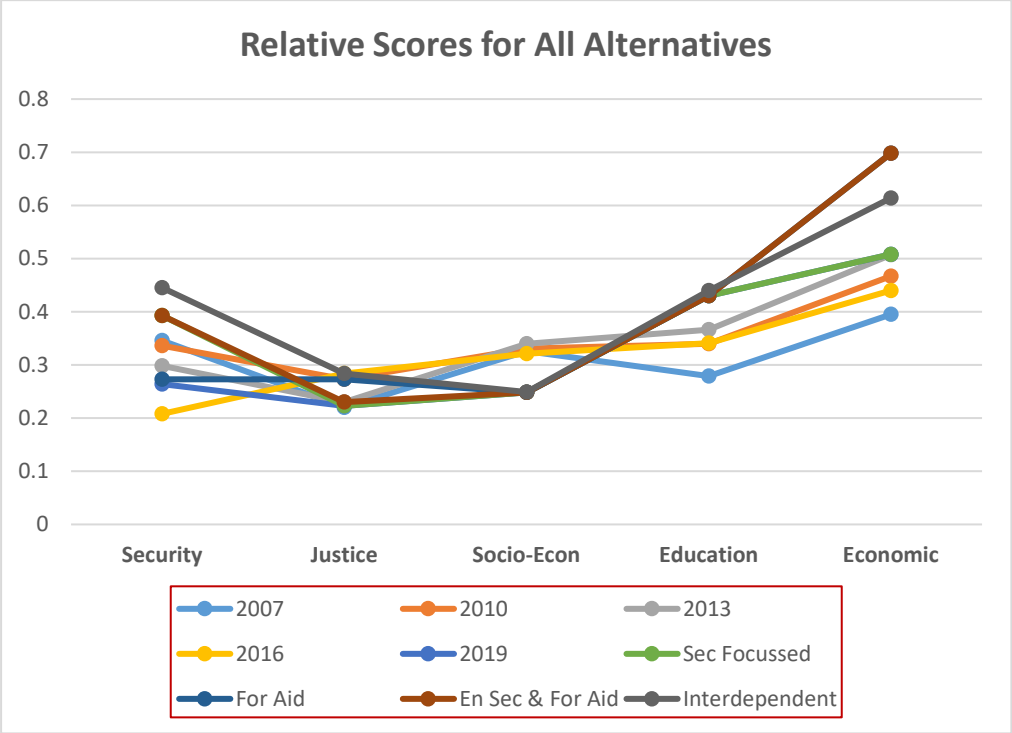


Figure 64 Ranking with Interdependent Alternative

4.2.1 Sensitivity Analysis

Sensitivity Analysis remains a corner stone of any analysis. In this research, it is proposed that a thorough sensitivity analysis will provide the hypothetical core committee an opportunity to consolidate their beliefs in the consensus based value hierarchy and make adjustments if required. The research conducted the sensitivity analysis employing the COSA technique as suggested by Chambal *et al* (Chambal, *et al*. 2011). COSA allows the decision maker(s) to tailor the sensitivity analysis to the desired decision context by assigning weight coefficients of elasticity to the attribute weights. These parameters let the decision maker choose how the

adjusted weight change is distributed throughout the model and is recommended by authors for complex hierarchies. However, the equal weights approach proposed by Schmidt and Baron (Barron & Schmidt 1988) was also analyzed and will be demonstrated first.

Sensitivity Analysis with Equal Weights

Figure 65 highlights the results of conducting sensitivity analysis with equal weights. It is understood that the ranking of the hypothetical alternatives will not vary if the weights are set as equal. The scores on data collected over the years generally remains the same except the value has decreased by about 2% for all alternatives. The ranking order is also reversed but the scores remains within the same range. The take away from this procedure is that when we have 40 attributes to measure, each attribute's weight is 0.025 under equal weighting, which is individually immaterial to bring any noticeable changes in the results. Therefore, equal weights technique is not preferred for complex hierarchies.

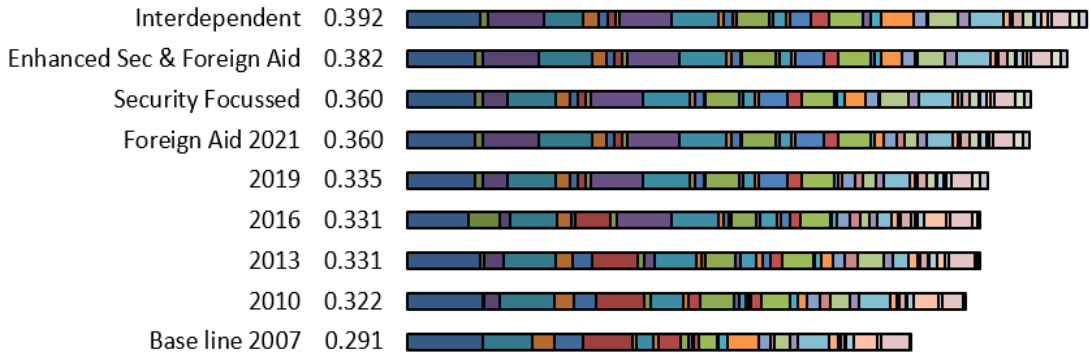


Figure 65 Ranking with Equal Weights

Customizable One-Way Sensitivity Analysis

Often, questions are raised about the actual weights, even when determined by consensus or an ultimate decision maker. For this reason, a one-way analysis of the sensitivity of the weights to change can be useful. Customizable One-Way Sensitivity Analysis (COSA) was the other technique used to employ sensitivity analysis. The weight of one of the objectives in the second

tier was altered, assuming that these weights were assigned by the members of the core committee after consensus. The other weights were proportionally changed. The weighting in the subsequent tiers of hierarchy was not altered assuming that these weights were agreed by the SMEs in their area of expertise with the consent of the overall committee. The results are discussed in subsequent paragraphs.

COSA Analysis for Security

The weight of security was reduced to 0.25 from 0.3 for the analysis. Proportionally the weight of the other objectives was increased. The results are displayed in Figure 66. The overall results in ranking display a change where the Security focused alternative that was in the third place in the original hierarchy; drops to fourth place which is understandable because of the new weight allocated to security.

Global sensitivity analysis conducted for security also supplements the finding that the 'Interdependent" alternative (an alternative where the changes due to enhanced foreign aid and security impacted other measures as well) remains the dominant alternative if the weight of security was greater than 0.15 as displayed in Figure 67. Similarly the decision is also robust and will not change unless weights are changed by 0.1 (0.15 Vs 0.25).

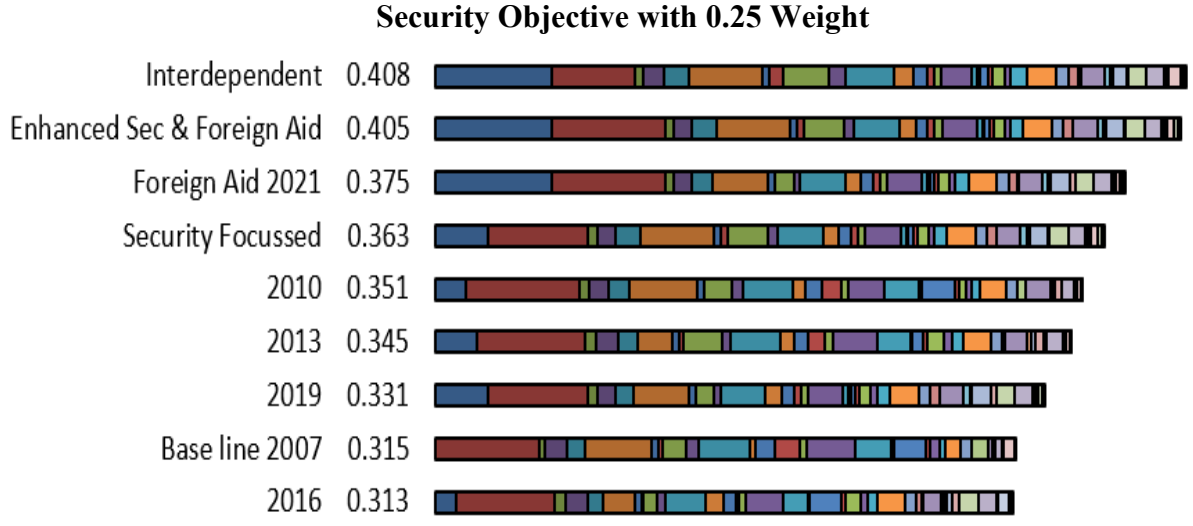


Figure 66 Ranking with Security Weight (0.25)

In order to gain further insights, the weight of security was increased to 0.35 and proportionally the weights of other objectives were reduced. While the overall ranking results were only increased by about 1%, the security focused alternative reclaimed the third rank as anticipated. The sensitivity analysis also did not reveal any change in the dominant status of interdependent alternative. The results are displayed in Figure 68.

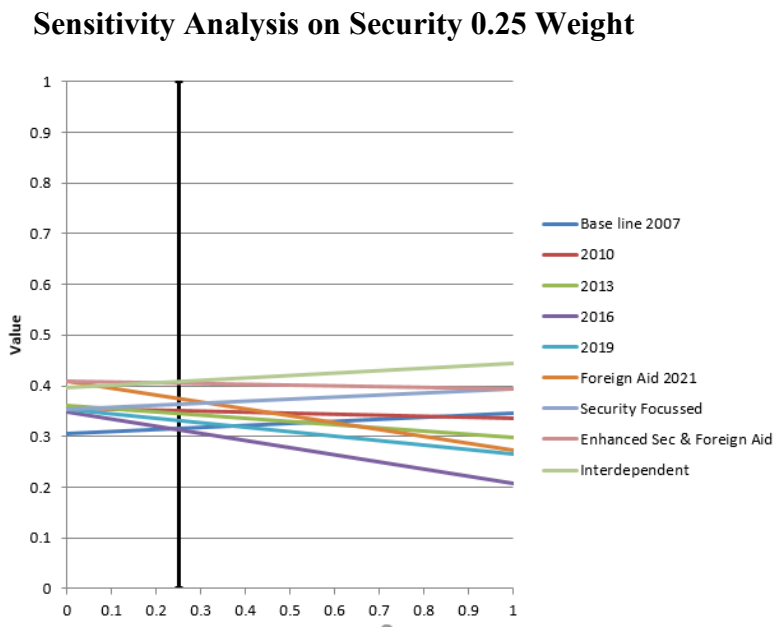


Figure 67 Sensitivity Analysis on Security 0.25 Weight

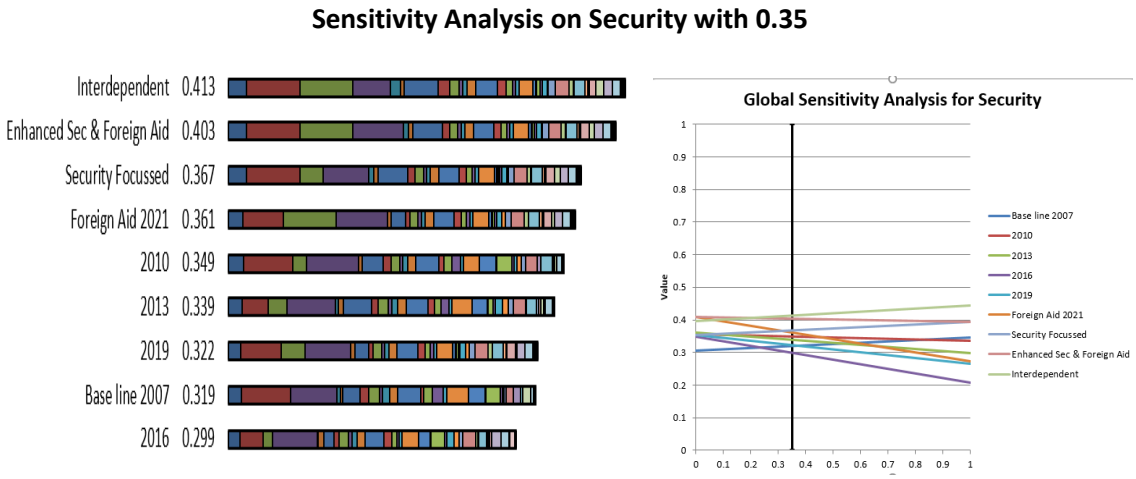


Figure 68 Sensitivity Analysis on Security 0.35 Weight

COSA Analysis for Justice

Sensitivity analysis with the weight change in Justice was also carried out with an increased weight of 0.27 and a reduced weight of 0.17. The results are displayed in Figures 69 and 70. Interestingly, the overall score reduces by about 1.5% when the weight of justice is increased and is almost the same as original score when the weight is reduced to 0.17. Interdependent alternatives remains the dominant alternative in both cases and the weight changes do not alter the rankings of the alternatives.

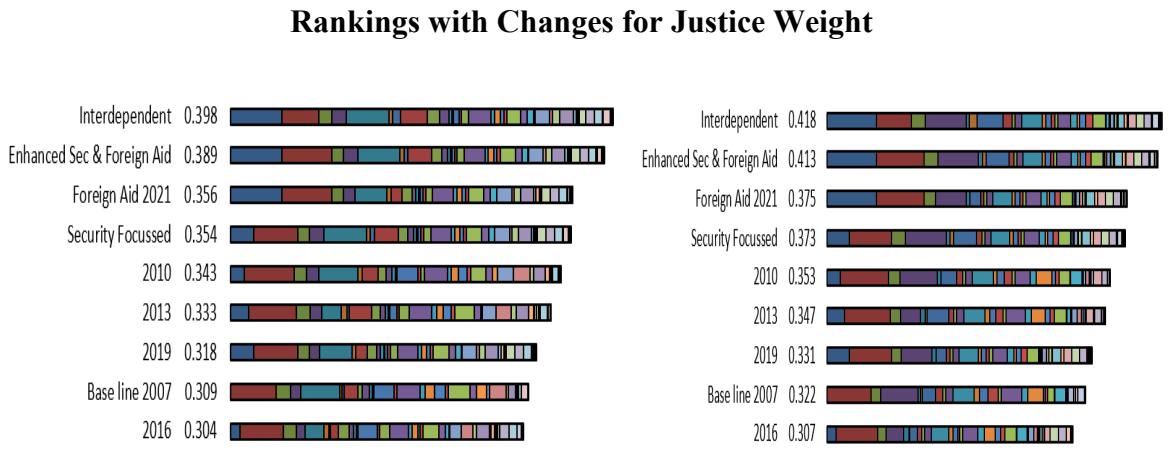
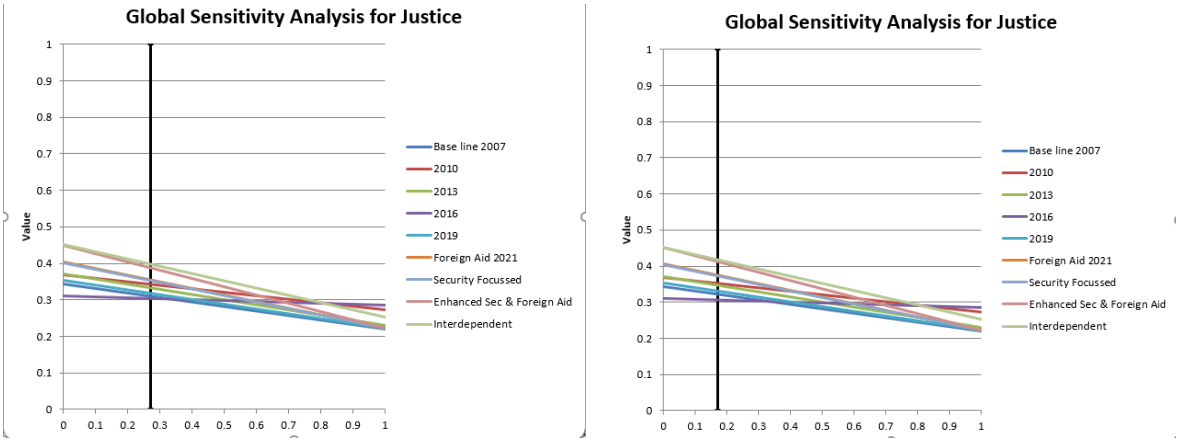


Figure 69 Rankings with Weight Changes for Justice



Justice Weight 0.17 Justice Weight 0.27

Figure 70 Sensitivity Analysis for Justice with Weight Changes

COSA Analysis for Economic Opportunities

A similar analysis was also carried out with weight changes in the Economy related objective. The weights were changed to 0.25 and 0.15 from the initial allocation of 0.2. The results are displayed in Figure 71. The results highlight the importance of economic opportunities where a proportional gain and loss is visible as the weights are altered.

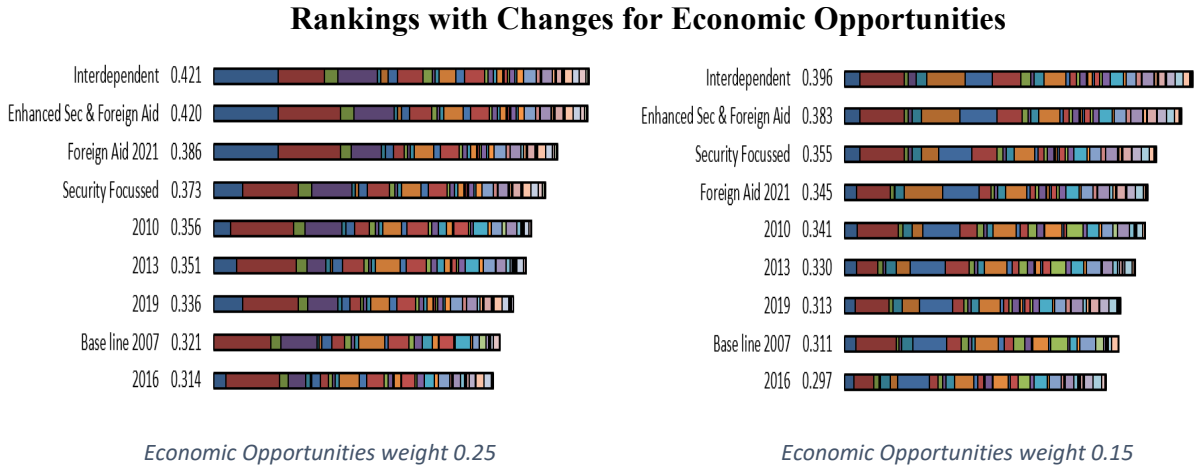


Figure 71 Rankings with Economic Opportunities

Sensitivity Analysis for Economic Opportunities

The global sensitivity analysis presents an interesting scenario, at the original weight, the "Interdependent" and "Enhanced Security & Foreign Aid" alternatives are almost equal. If the weights are altered from the present value a value of 0.35, then the former becomes the best alternative and if the weights are increased the later becomes the best ranked alternative as displayed in Figure 72.

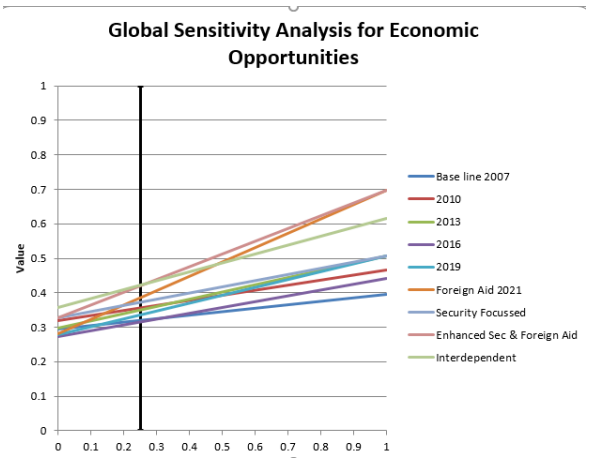


Figure 72 Sensitivity Analysis for Economic Opportunities

Sensitivity Analysis for Education

Sensitivity analysis for education highlights that "Interdependent" and "Enhanced Security & Foreign Aid" alternatives stand out as dominated alternatives with almost equal rank. The change in allocated weights for education is not going to impact the rankings. The results are displayed in Figure 73.

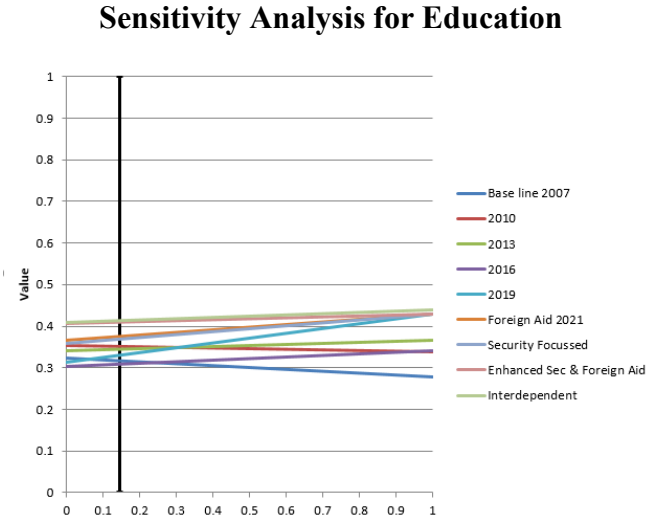


Figure 73 Sensitivity Analysis for Education

Sensitivity Analysis for Socio-Economic Aspect

Sensitivity analysis for socio-economic aspect highlights that "Interdependent" and "Enhanced Security & Foreign Aid" alternatives stand out as dominated alternatives with almost equal

rank again and until the weight of this aspect is increased to 0.5 (quite unlikely), the rankings of the alternatives will not change. The results are displayed in Figure 74.

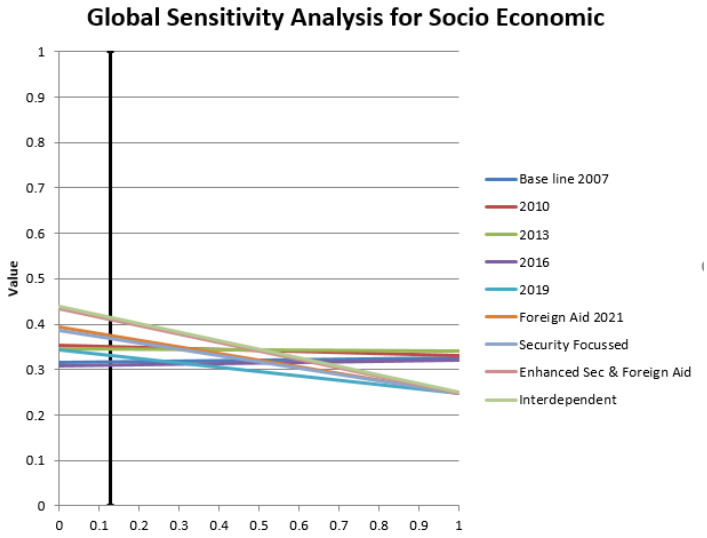


Figure 74 Global Sensitivity analysis for socio-economic aspect

The sensitivity analysis reveals that interdependent hypothetical alternative is dominating other alternatives and the results achieved are robust in nature. The present set of weights allocated by hypothetical core committee through consensus support the interdependent alternative for implementation. The sensitivity analysis is proposed to be viewed as a guideline for implementing the RRR program, a revisit to the weighting strategy and values is recommended periodically to monitor and steer the RRR program in a successful direction.

4.2.2 Overall Analysis

The proposed framework for a RRR effort essentially requires careful analysis. The analysts and decision makers are likely to come across two types of data sets. The first will be the actual data gathered over the years whereas the other set will be the predictive data which may be hypothetical to set realistic targets and see the impact on the results once those targets are achieved. Both types of data sets are helpful and essential for any meaningful progress.

Analysis for Yearly data

As highlighted in the notional case study for a RRR in pre-withdraw Afghanistan, the actual yearly data highlights some aspects, which are appended summarized as follows:

(a) The Security Stability Transition and Reconstruction Operations (SSTRO) conducted by the global alliance led by US achieved very little when viewed under the scope of the notional consensus based value hierarchy as discussed in this research. The magnitude of assistance in various sectors was accessed from US Foreign assistance[40] database. The progress remained between 0.317 as ranked in 2007 and reached 0.330 in 2019 with minor variations during all these years.

(b) A debate about the measures chosen to gauge progress can be initiated; however, these measures, based on the literature are specific to this model and hypothetically approved by the all-inclusive core committee. A different committee of decision maker may opt for different measures which may alter the ranking, however, the underlining during the period will essentially remain the same.

(c) The first tier objectives that witnessed improvement in these years were largely related to education, economy and socio economic sector that are considered as intermediate steps in RRR. In order to sustain and subsequently build on these improvements; a stable security situation and an efficient judicial system remains an immediate and essential requirement, which was not sustained in the last two decades in Afghanistan.

Predicted Hypothetical Data

In this model, the predicted data is primarily used to understand the variations of results in desired areas once hypothetical alternatives are generated. The hypothetical alternatives can be presented to the core committee which can possibly utilize them as following;

(a) The model can be used for an insight into the future. The core committee can set targets to be achieved for specific measures, which will reveal the overall impact on

[40] https://foreignassistance.gov/cd/afghanistan/ accessed 23 March,2022

the score and ranking. An efficient application can be in the form of identifying the areas that bring the greatest impact based on existing weights as specified by the core committee. The outcome can be used to reevaluate weighting for the entire hierarchy or within a certain objective.

(b) The entire process is easy to formulate, apply, analyze and repeatable. The core strength remains the transparency and simplicity, since the results can be easily replicated and explained in the event of new members in core committee. Consensus, Hesitant Linguistic preferences also accord acceptability and credibility to the process.

(c) Concurrently, the resources can be better allocated to achieve the selected targets. A periodic review will help all stakeholders to better ascertain the progress, validity and confidence in the entire exercise.

RRR will be a dynamic process which could go on for years, the framework proposed, bolstered by analysis provides a methodology to support those efforts overtime weighing the impact and effectiveness of proposed actions,

5 Summary, Conclusions and Recommendations

5.1 Introduction

Conflict has sadly been a constant part of history. Winning a conflict and making a lasting peace are often not the same thing. While a peace treaty ends a conflict and often dictates terms from the winners' perspective, it may not create a lasting peace. Short of unconditional surrender, modern conflict ends with a negotiated cessation of hostilities. Such agreements may have some initial reconstruction agreements, but Reconciliation, Restoration and Reconstruction (RRR) is a long term process. This dissertation maintains that to achieve a lasting peace: 1) The culture and beliefs of the conflict nation must be continuously considered and 2) RRR is a long term effort which will occur over years not just in the immediate signing of a treaty or agreement. To assure the inclusion of all stakeholders and gain the best results, an array of Operations Research techniques can be used to support the long term planning and execution of a RRR. The final decisions will always be political, but the analysis provided by an OR support team will guide the decision makers to better execute consensus decisions that incorporate all stakeholder needs. The development of the value hierarchy framework in this dissertation is the keystone of building a rational OR supported long term plan for a successful RRR.

The last few years have seen a severely politically polarized world (Carother and O Donohue 2019) where daggers are being redrawn as polarization is viewed as one of the greatest threats to democracy (Carother and O Donohue 2019) . Ghosts of the "Cold War" have resurfaced once again[41] as Russian vodka in US bars and McDonalds in Russia makes an exit. RRR efforts are imperative for conflicts that are likely to be prolonged over extended periods of time as

[41] https://apnews.com/article/cold-war-echoes-russia-us-ukraine-0050dd806e5f8748bf59b5e84d15b959 accessed 10 Apr,2022

witnessed in Afghanistan, Syria, Yemen, Ethiopia and Ukraine to name a few. The research highlights that magnitude of conflict time is directly proportional to the extent of RRR efforts.

The research planned to inquire, analyze and attempted to address a number of fundamental questions related to nation building, reconstruction of a country or Security Stability Transition and Reconstruction Operations (SSTROs) as termed by US led coalition for Afghanistan and Iraq. The research inquired as to the existence of an acceptable methodology for the all of these terms. An affirmative answer posed the leading question regarding dynamics of these efforts. The research intended to inquire if these nation building efforts were cognizant and encompassed the cultural and religious perspectives of the affected regions. The research attempted to answer the usual outcomes based on collection of recent history and attempted to suggest a framework to answer these questions. The research proposes a modeling framework for the rebuilding, restoration and reconciliation of any conflict ridden area. The key contribution is the proposal of a framework acceptable to all stake holders. The claim of acceptance is based on the rationale of scrutinizing a wicked political problem under the lens of Operations Research and Decision Analysis techniques that are globally accepted.

Summary of the Explored Literature. The literature explored for the research was multi-faceted. The exploration focused on three main areas of

(a) Nation Building and Reconstruction efforts post Second World War.

(b) Operations Research and mathematical and statistical approaches and their suitability for supporting possible decision/planning solution.

(c) Consensus management, Negotiation skills and relevant aspects of project management.

5.2.1 Nation building and Reconstruction efforts

A summary of the literature explored for nation building is provided in Table16. It is important to highlight that the research explored how nation building was approached by notable stalwarts

in the field. The research also analyzed the US Department of Defense directive 3000.05 which was the guidelines followed for SSTROs in Afghanistan and Iraq. The research considered the common aspects posited by the authors and proposed contours; based on these contours, the research proposed pillars on which a sustainable framework for RRR can be developed. This proposed framework may be applied in any conflict ridden country after changes and adjustments based on cultural preferences and values.

Salient Points for Nation Building / Stability / RRR

Dobbins	Covey	Manwaring and Joes	Robert Orr	DoD Directive 3000.05	Proposed Objectives
Security	Moderating Political Conflict	Establishment of Law and Order	Security	Security	Establishment of Security
Humanitarian Relief	Defeating Military Extremists	Isolation of Belligerents	Governance and Participation	Local Governance structures	Establishment of Law and Order
Governance	Institutionalizing Rule of Law	Sustaining Life, Relieving suffering, and Regenerating Economy	Social and Economic well-being	Promoting bottom – up economic activity	Maintenance/ Repair / Creation of Critical Infrastructure
Economic Stabilization	Developing Legitimate Political Economy		Justice and Reconciliation	Rebuilding Infrastructure	Establishment of Credible and Effective Indigenous government
Democratization				Building Indigenous capacity for such tasks	Establishing democratic institutions representing populace

Table 16 Salient Features of Nation Building

5.2.2 Operations Research, Mathematical, Statistical Approaches to RRR and Wicked Problems.

This research, assumes that all players desire a sustainable peace and development in a conflict ridden country. The research discussed pre – withdraw Afghanistan as a case study, where a hypothetical core committee is suggested that involves all stake holders. Incidentally, the same argument was witnessed after the US withdrawal in Afghanistan in August 2021, where it was coined as an “All-inclusive government”.

The research problem addressed in this dissertation is a multi-objective dynamic problem and perhaps compensatory in nature. It cannot be assured that everything will be achieved at the most desirable level. That is, negotiation and compromises will certainly be necessary. What is "optimal" for one party will often not be optimal for some of the other parties to the issue. The compromises by the stake holders will become the point of a negotiation analysis. On a similar note, although treating this problem as a multi-objective problem is not the only solution and may not be the optimal solution for the problem, it certainly remains a worthwhile alternative to be considered. Churchman has suggested Rittel termed these as "wicked problems" where:

> *"Wicked problems" refer to that class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing. (C. West Churchman, "Wicked Problems" Management Science, VoL 14, No. 4, December, 1967, p. B-141)*

Military planning is inherently a series of "wicked problems" as is discussed in the *NATO Guide for Judgement-Based Operational Analysis in Defence Decision Making*, TR-SAS-087, among other references. The research presents a fine linkage between a political problem like RRR which is proposed to be tackled through OR techniques. Figure 75 highlights the broad contours and conceptual framework of appropriate OR techniques used while developing, implementing and conducting dynamic analysis of consensus based value hierarchy.

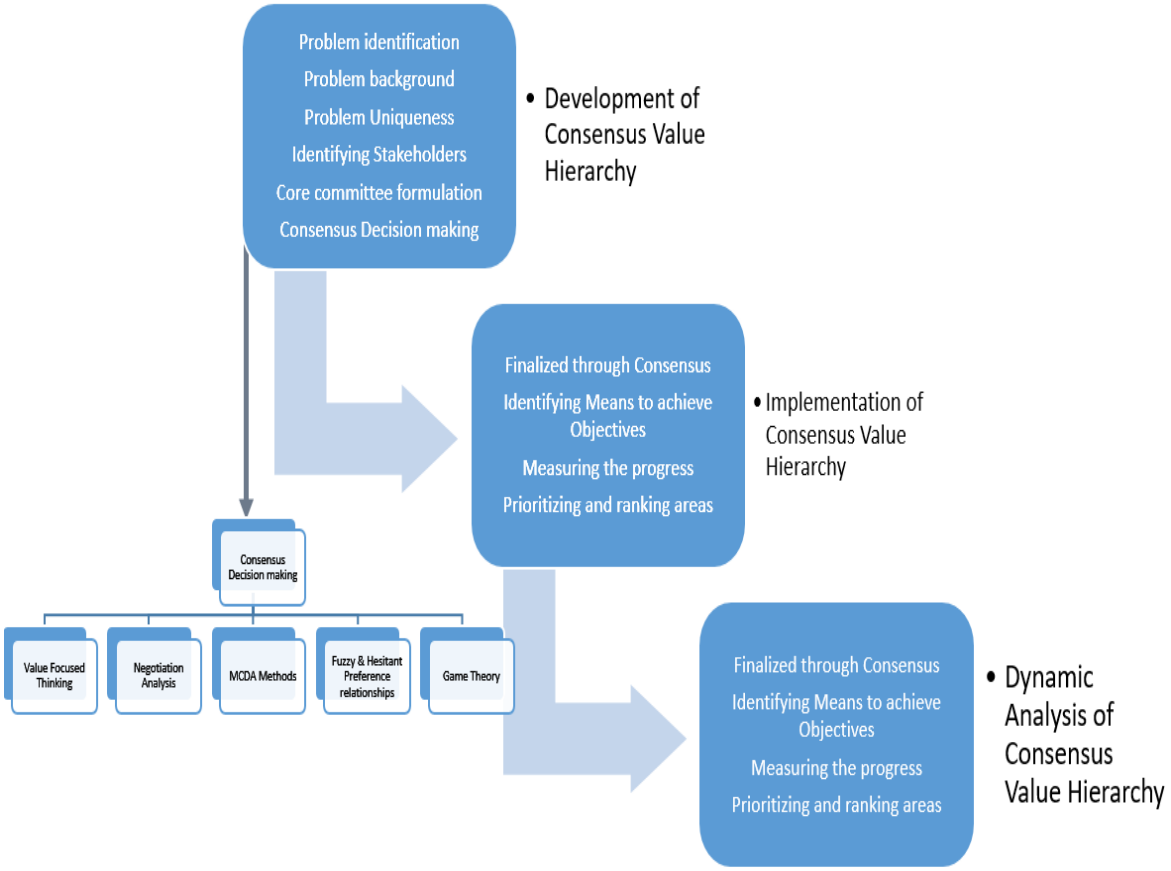


Figure 75 Contours of Amalgamation of Operations Research Techniques and RRR

5.2.3 Consensus Management, Negotiation skills and relevant aspects of Project Management

The research explored achieving Consensus decision making by utilizing Value Focused Thinking to develop a value hierarchy that is mutually agreed by all stake holders. The communication and clarity amongst a diverse group of stake holders is achieved by employing Hesitant Fuzzy Linguistic Term Sets (HFLTS) and linguistic variables. Various decision analysis techniques were explored as highlighted in Figure 75, however, building on the Value Focused Thinking technique was considered most suitable for adoption in RRR scenarios. While some liberties were taken with strict VFT theory, they were necessary to deal with a multi-year, multi-decision maker problem who are likely to have conflicting values. The

consensus based value hierarchy achieved through negotiated agreement is subsequently important for the implementation of the objectives specified by the decision makers. The research also explored the role of "Negotiation Analysis" and "Game Theory" during consensus achievement. The possible application levels and examples were also highlighted in the literature review. These aspects are considered unique while approaching RRR efforts in a conflict torn country. A consensus based value hierarchy can subsequently be used for policy decisions, steering committee decisions and subsequent analysis in a dynamic situation. The alternatives generated through available data can be used to formulate an optimal strategy. The perceived problems while dealing with missing data in a conflict ridden country are also explored and highlighted in the research. Figure 76 describes the conceptual contours as posited in the research for various processes during the proposed RRR process.

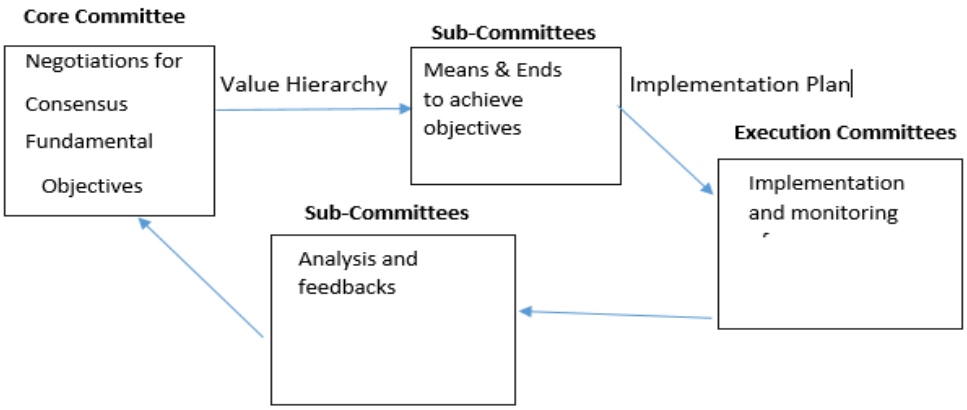


Figure 76 Conceptual Contours of RRR Process with in committees

RRR effort is a modified case of project management, the research proposes Project Portfolio management (PPM) as RRR effort is a multi-project environment. The research suggests that effective management of one individual project is not enough, parallel projects increase the importance of coordinated management for RRR and PPM as highlighted by Killen, Hunt, & Kleinschmidt *(*Killen *et al, 2007)* is considered an appropriate technique to handle the complexity. The core committee shall re-visit the consensus based value hierarchy on a regular basis in order to address any significant change / event in the entire scenario. Concurrently,

implementation of projects must also be reviewed and the entire cycle highlighted in Figure 76 is strongly proposed for implementation.

Table 17 Project Portfolio management and RRR

Lack of PPM	Short term Consequences	Long term Consequences	Impact
The strategic vision and fundamental objective is not incorporated	The projects are not aligned with the strategic objectives Resource allocation is haphazard	The quality and cost is not ensured The desired results are far from achieved	The local populace in the case of RRR does not take the ownership of the entire effort
Project selection is haphazard and influenced by emotions, political motives	Selected projects cannot be justified especially with foreign donors A specific area gets more focused instead of even distribution	Some projects may be left unfinished due to lack of funding or change in political environment	Local populace tends to lose faith in RRR efforts International donors earn a bad reputation due to the bias in the entire process
Optimal project prioritization is lacking	Non judicious utilization of resources	Projects are equally pursued without realizing relative importance and dividends	The portfolio lacks implementation of strategic vision and thus claims at conception cannot be validated through implementation
Contracts are awarded in non-transparent manner	Corrupt practices are common Quality of work is compromised	Projects do not adhere to allocated budget and timeline	The essence of RRR is lost and the intended benefit for the masses never gets delivered

5.3 Case Study of Afghanistan 2007-2019

The conflict ridden country of Afghanistan was analyzed to demonstrate the proposed framework. Utilizing the additive value model, alternatives were ranked to gain insights. The research had two categories of alternatives, alternatives based on yearly data available through various internationally recognized and accepted data sources. The other set of alternatives were created hypothetically to gain further insights into the model. These alternatives included one with enhanced security, one with enhanced foreign economic assistance, one with both these factors enhanced and the interdependent alternative where benefits of enhanced security and economic assistance were spread across the entire measures. The research demonstrated the ability to use the model both as predictive and analytic for informed decision making in RRR scenarios.

The fundamental objective of the RRR in Afghanistan remained a sustainable and lasting peace. The cultural aspects of Pashtunwali, the values and guidelines of Sharia law have been addressed by forming an all-inclusive hypothetical core committee. The first tier objectives and their relative weights are displayed in Table 18. It is considered important to highlight the role of an accepted International organization like the UN, EU or OIC which has the authority and capacity to supervise the entire process of RRR.

Consensus Based Hierarchy

Objective	Importance	Weight
Socio Economic Uplift (SEU)	Least important	0.0909
Economic Opportunities	Twice important to SEU	0.1818
Education	Twice important to SEU	0.1818
Justice	Thrice as important to SEU	0.2727
Security	Thrice as important to SEU	0.2727

Table 18 Relative Weighting in Consensus based hierarchy

5.3.1 Implications of the Case Study in Afghanistan

The implications of the application of proposed framework in Afghanistan are manifold. It can be divided in two main categories that remain historic and predictive. It is prudent to discuss both separately.

5.3.1.1 Historic Data Implications

Afghanistan has been a conflict ridden country since at least the Soviet invasion in 1979. The area has not witnessed stability for over four decades and peace still seems a distant road ahead. The key contribution of the research is that hypothetical core committee includes all stakeholders, a concept that has only existed theoretically in

academia. A hierarchy developed through the hypothetical core committee takes into account the local values including Pashtunwali and Sharia law. The results achieved by the proposed model reveals the lack of success of RRR effort in pre-withdraw Afghanistan that did not include all stakeholders (the Taliban which were a major stakeholder in the conflict were not included). The results based on data from internationally credible sources like Asia Foundation, US Foreign Assistance Program and other organization are displayed in Table 19. The results overall paint a dismal picture where the best score achieved during the entire SSTRO effort was 0.351 in 2010. This result indicates that despite massive efforts, on a scale of 0 to 1, a score of only 0,35 was attained when measured against the consensus based hierarchy that was proposed by hypothetical core committee. The least contributors were the objectives of security and justice which actually displays a sinusoidal curve during the selected period.

Alternate Year	Score	Improved First Tier Objectives	Reduced First Tier Objectives	Remarks
2007 (Base line)	0.317			
2010	0.351	Justice, Socio Economic, Education, Economic	Security,	
2013	0.344	Security, Justice, Socio Economic, Education, Economic		
2016	0.309	Justice, Education, Economic	Security, Socio Economic	
2019	0.330	Justice, Education, Economic	Security, Socio Economic	

Table 19 Scores Achieved on basis of Available data

The presidential elections in Afghanistan and the resultant Karzai government (2002-2014) and Ashraf Ghani government (2014-2021) were both met with massive

allegations of corruption and fraudulent activities. The overall results for the proposed model coincide with the events on ground and the lowest rank is achieved in 2016 where the situation was considered worst in light of consensus based value hierarchy. The salient features are very little initial improvement in Justice until 2016 and subsequent decline from 2016-2019; deterioration of Socio Economic sector from 2014-2019 along with declining security are the major contributors since Justice and Security were accorded the highest weight by the hypothetical core committee.

5.3.1.2 Forecasting Assistance

A strength of proposed model allows the decision makers to investigate the likely outcome in hypothetically generated and real alternatives. A set of four other alternatives were developed for this research. The enhanced security alternative registered an increase to 0.368 from the base line case of 0.346 in 2007. The hypothetical alternative with enhanced foreign aid and economic assistance scored 0.374 as an overall result. Combining these two aspects of hierarchy, the hypothetical alternative generated with both security and enhanced foreign aid scored 0.409 which is a significant change when compared with baseline case of 2007.

The Interdependent alternative that had a prime change in the Security values where the number of terror attacks, kidnapping, and people fearing for their life reduced. At the same time the spending budget and other factors were kept at the same level. In the justice domain, changes were proposed for favorable public opinion, faith in courts and crime rate with all of these measures improved by 10%. On the economic front, the foreign debt was kept the same as other hypothetical alternatives with foreign funding kept at the same level as for security focused alternative which is a shade lower than the funds received by Afghanistan in 2019 ($4 billion compared to $4.4 billion). The

measures related to education also improved by 5-10% in terms of enrollment, but the number of universities dropped to 80 instead of 94, which was the number in 2019. The overall score achieved by this alternative was 0.414 which is the highest amongst all the alternatives. The extrapolative component of the model is considered an important contribution to gauge the effect of a change in strategy before implementing it.

Sensitivity analysis with changing weights also enables the hypothetical core committee to analyze the robustness of their weights and preferences. Similarly, SDVFs can also be instantly revisited whenever there is an altered situation on ground.

5.3.1.3 Model as an Implementation Tool

The proposed model can be very insightful for effective implementation of a strategy achieved after consensus. Relevant data collection is considered critical for effective analysis especially in a feedback mechanism. Recurring data collection based on a pre specified time (quarterly, six monthly or yearly) is a good indicator of the progress achieved in light of developed hierarchy. This feedback can be effectively used to re-adjust weights to different objectives based on the emerging situations. Similarly, resource allocations can also be explored based on the predictive and historic options offered by model after data collection.

The proposed framework can be applied globally since its foundations are based on established principles of academia. The region specific aspects of culture, religion and values will need to be adjusted for a specific region. For example, the literacy rate of those over 15 in Afghanistan is 37.3% with males being 52.1% and females being 22.6% according to the World Fact book. Ukraine has a literacy rate of 99.8% with male literacy of 99.8% and female literacy is 99.7%. While education and training will no doubt be valued by both in RRR, weights and break points may differ. The United

Nations, European Union, African Union, Organization of Islamic Countries and other such organizations are requested to understand, evaluate and if successful; implement the proposed framework in any future RRR effort.

5.3.2 Recommendations and Future Research

The proposed framework presented by the research is a unique effort to support a long standing political-problem. A solution is proposed with utilization of OR and Decision Analysis techniques. In order to take the research to the next level, the following is proposed for future research:

(a) The hypothetical core committee included every stake holder to the conflict. These stakeholders were allocated equal weights. A relative weighting to a stake holder based on factors like influence, representation and many others is likely to add another dimension to this research.

(b) Project management where selection, implementation and termination of a project based on the developed model is another avenue for future research.

(c) Sentiment analysis may also be conducted concurrently to further improve the consensus based hierarchy in terms of data collection and feedback.

5.3.3 Conclusion

The proposed framework is an effort to add new aspects to an existing wicked problem of nation building. Reconciliation Restoration and Reconstruction is the new suggested terminology where Reconciliation is supported by consensus amongst all stakeholders. Restoration of services, basic rights and Reconstruction of a conflict ridden country in terms of infrastructure and institutions are conceived, prioritized, executed and monitored based on the consensus achieved in reconciliation process. The proposed framework is considered a positive contribution to achieve lasting and stable peace in a conflict ridden country.

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14. ABSTRACT
Conflict has sadly been a constant part of history. Winning a conflict and making a lasting peace are often not the same thing. While a peace treaty ends a conflict and often dictates terms from the winners' perspective, it may not create a lasting peace. Short of unconditional surrender, modern conflict ends with a negotiated cessation of hostilities. Such accords may have some initial reconstruction agreements, but Reconciliation, Restoration and Reconstruction (RRR) is a long term process. This study maintains that to achieve a lasting peace: 1) The culture and beliefs of the conflict nation must be continuously considered and 2) RRR is a long term effort which will occur over years not just in the immediate wake of signing a treaty or agreement. To assure the inclusion of all stakeholders and gain the best results in dealing with this "wicked problem", an array of Operations Research techniques can be used to support the long term planning and execution of a RRR effort. The final decisions will always be political, but the analysis provided by an OR support team will guide the decision makers to better execute consensus decisions that consider all stakeholder needs. The development of the value hierarchy framework in this dissertation is a keystone of building a rational OR supported long term plan for a successful RRR. The primary aim of the research is to propose a framework and associated set of guidelines derived from appropriate techniques of OR, Decision Analysis and Project Management (right from development of a consensus based value hierarchy to its implementation, feedback and steering corrections) that may be applied to help RRR efforts in any conflict ridden country across the globe. The framework is applicable to any conflict ridden country after incorporating changes particular to any country witnessing a prolonged conflict.

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