



PROJECT COMAC: HUMANITARIAN AID TO AFGHANISTAN

Risk Management Plan

ABSTRACT

A USAID contractor prepares a bid for an upcoming \$40 million project to assist communities in war-torn Afghanistan. To assess the inherent risks involved, the authors of this paper used the Analytic Hierarchy Process to analyze the likelihood and impacts of various risk events by identifying and analyzing their causes and consequences. The paper concludes with recommendations that can control these risks, and provides an optimal plan for mitigating and preventing as much loss as possible.

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Risk Management, Fall 2017

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Background

Since the defeat of the Taliban in late 2001, Afghanistan has become a focal-point for the international development community. Once a rogue-state with limited exposure to western nations, the country has been flooded with billions of dollars' worth of aid and assistance from nations, foundations, and organizations across the globe. The United States' Agency for International Development (USAID) has been at the forefront of transforming Afghanistan from a war-stricken country into a stable and prosperous nation.

USAID has recently posted an RFA for a project aimed at assisting Afghan civilians and communities who have been victims of violence during the Afghan government and NATO military actions against insurgency groups. Entitled Conflict Mitigation Assistance for Civilians (COMAC), the project will be awarded through a cooperative agreement¹ with a ceiling of \$40 million.

The need for such interventions continues to rise as the end to violence seems nowhere in sight. The Taliban, ISIS, and other militant groups are operating at high-levels and conduct attacks and commit acts of terrorism against Afghan authorities, foreign troops, and Afghan civilians throughout the country. Additionally, non-military foreigners are also targeted by terrorists, insurgents, kidnappers, and criminal organizations.

There has been a recent uptick in coordinated attacks against foreign and local aid workers. As part of a day of coordinated attacks by the Taliban in early-September of 2016, armed militants detonated a large car-bomb in front of the CARE International offices in Kabul and stormed the building. Luckily, none of the 42 civilians there, including 10 foreigners, were hurt. Such cases prove that NGO and international development operations and staff have shifted from victims of collateral damage to primary targets of armed militant extremists.

It is imperative for contract and grant awardees to understand the risks their projects are vulnerable to, as well as how to mitigate their exposure to and impact from them: not only for the safety and well-being of their staff and property, but the donating organization's (USAID) investment in them to carry-out the project's objectives.

Risk Model Components

The elements that make-up and prioritize the risks facing this project, or any project, include the following: a) events, or risk events; b) sources; and, c) objectives. In order to identify, analyze, and ultimately manage these risk elements, the team will use Expert Choice Riskion software. This tool enables a team of project experts to collaborate in identifying risks, prioritizing objectives, and selecting controls to mitigate them.

The following provides the steps taken, in order, to build this risk model.

Risk Event Identification

For the purpose of risk analysis and management, an event, or risk event, is defined as an uncertain occurrence that results in a loss or other negative impact to an objective or asset. As this type of program would require a staff of approximately 40 – 50 full-time employees on the ground in Kabul, which would include about four to six foreign experts, we focused on risk events that would impact them and their work.

¹ Cooperative agreements are used when the principal purpose is the transfer of money, supplies, services, or anything of value to the recipient in order to accomplish a public purpose of support; and substantial involvement is anticipated between USAID and the recipient during implementation of the activity.
www.usaid.gov

Ultimately, we came up with the following list of events, which range from highly unlikely to somewhat common. For a more detailed description of them, please see Annex A: Risk Event Details.

Events
Targeted attacks by terrorists
Forced detention/Arrest
Attack on Housing Complex
Kidnapping
Unexpected Bombing in local areas
Indiscriminate Gunfire
Robbery
Funding pulled or reduced
Car Jacking
Noncompliant activity

Figure 1: Risk Events Facing COMAC

Sources and Threats

Following the identification of the risk events above, we researched to find the factors that cause them to take place, and/or increase their likelihood. These are defined as sources, or threats; although they may lead to an event, which in turn negatively impacts an objective or asset of the project, the sources do not themselves cause losses. Each source can potentially lead to one or more risk events.

Even though NATO troops, the local Afghan National Security Forces (ANSF), and Afghan National Army are present throughout the country, the nation is engulfed in sectarian violence and extreme-insecurity. This type of environment is very conducive to the types of sources presented below in figure 2:

Sources/Threats
<ul style="list-style-type: none"> 1. Human factors <ul style="list-style-type: none"> 1.1. Untrained employees, who may not follow security and safety policy and/or procedures. 1.2. Corrupt employees who purposefully do not follow project policies and procedures. 1.3. Corrupt partners/subs 2. Conflict <ul style="list-style-type: none"> 2.1. Taliban/terrorist/insurgency presence or movement in area. 2.2. NATO-led forces presence or movement in area. 2.3. Tribal or civil-infighting that could lead to violence among local communities. 3. Criminal Activity <ul style="list-style-type: none"> 3.1. High violent crime in area 3.2. High petty crime in area 3.3. Lack of local security 4. Civil Unrest <ul style="list-style-type: none"> 4.1. Anti-Government demonstrations 4.2. International political stalemate/turmoil apathetic to project goals/objectives. 4.3. Anti-Western demonstrations

Figure 2: Sources/Threats Affecting COMAC's Vulnerability

Because we identified twelve specific sources, we grouped similar ones together into clusters. As the hierarchy shows, there are four major clusters, or groups, of threats and

sources. Doing so allowed our team of project managers and expert participants, who assisted with the structuring of the risk model, make judgements² more effectively.

The four clusters include the following:

- a) Human factors: These involve the project implementers, i.e. project staff and sub-contractors. There are three sub-sources, which include the ignorance of policies and violations, as well as the intention to violate them.
- b) Conflict: The mere presence of troops, of any side, could certainly lead to violence. Additionally, Afghan society is heavily divided among different tribes. Shifting alliances and the vacuum of a strong state or ruler often results in violent tribalism.
- c) Criminal activity: In an economically depressed place where rule of law is strongly lacking and unemployment is very high, crime of all forms can be rampant. Especially when the authorities are more concerned with insurgencies.
- d) Civil unrest: Afghans from all spectrums of life have often taken to the streets in protest, and many times these frustrations have been targeted at westerners, as well as government officials and security forces that COMAC may be cooperating with. The people and politicians in the west may also express discontent with their government's involvement in Afghanistan, which can also have repercussions in the country.

Objectives

The next step in the process is to identify the objectives of the COMAC project and its team. Within the AHP risk framework, objectives (or assets) are what's vulnerable. Should a certain risk event be triggered by one or more of its sources, it will cause a loss to one or possibly more of COMAC's objectives. Working together with the project team, we came up with the following list of objectives that would/could suffer losses from the identified risk events:



Figure 3: COMAC's Objectives and Sub-Objectives

The objectives are quite straight forward, and have also been placed into clusters with similar themes. The three clusters touch upon sub-objectives that feed into a successful program, which not only involves meeting the donor's KPIs, but increasing chances for other

² Miller's Law explains how the average human mind cannot accurately process more than seven, plus or minus two, things at the same time.

awards and contracts, as well as hiring and maintaining the best experts in the industry. The other two objective clusters deal with the safety and security of all personnel and physical assets.

Measurements

The likelihoods of events occurring, and the degree of their impacts, can be calculated. To derive this information, we used the help of expert evaluators' judgements, logic (provided by the AHP methodology), and historical data, where available.

Participants

To help analyze the likelihood of the risk events and sources, as well as their relationships with one another, a panel of three technical experts who have worked on Afghan aid programs were selected. They include the following:

Expert Participant and Role	Specialty
Zhenya Yayloyan – Former Chief of Party	As Chief of Party (CoP) of a previous project based in Kabul, and Deputy CoP on two others, Mrs. Yayloyan contains a breadth of first-hand knowledge and experience in managing programs in high-risk environments.
Collin Sumera – Global Risk and Security Manager	A former Marine, Mr. Sumera has worked as a risk and security consultant for the last eight years across the Middle East, former Yugoslavia, and Africa. He currently consults on another Afghanistan project implemented by the organization.
Bakdaulet Turagarayev – Project Consultant	With past experience on projects in Eurasia and Afghanistan, Mr. Turgarayev is a technical consultant assisting the organization prepare the grant proposal for the COMAC RFA.

Figure 4: Participants' Information

Together,³ they used their experience-based judgements to measure and determine the likelihoods of the events and sources, as well as the impacts the events would have on the objectives. Using Riskion software, the three experts and two project managers conducted measurements that, once synthesized with one another, would provide a risk event hierarchy.

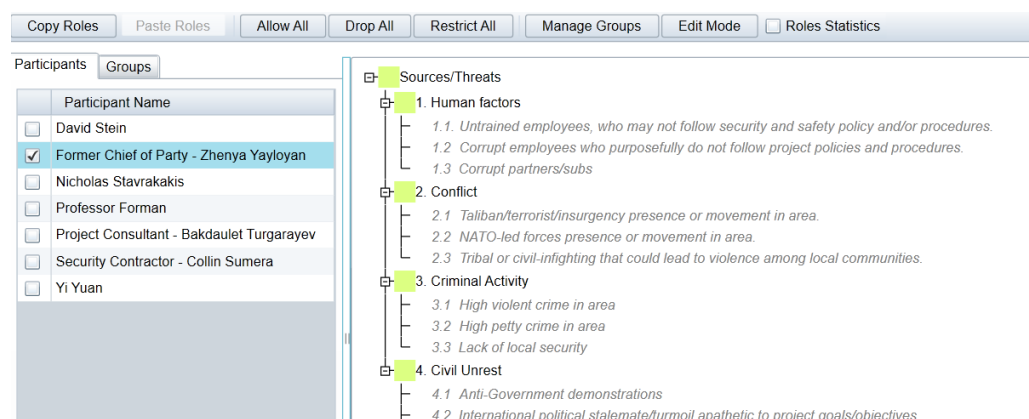


Figure 5: COMAC Participants' Roles for Evaluating Sources/Threats

³ In many cases, the evaluation of one team member, or group, would be based in more experience or specialty with specific sources and/or events, and therefore be more valuable. When this is the case, one might exclude others from types of evaluations. Because the COMAC evaluators have all worked in Afghanistan and are technical experts in the subject matter of wartime-aid, they are fully aware of the multiple events and sources that aid projects are vulnerable to. Therefore, all have contributed equally in this evaluation.

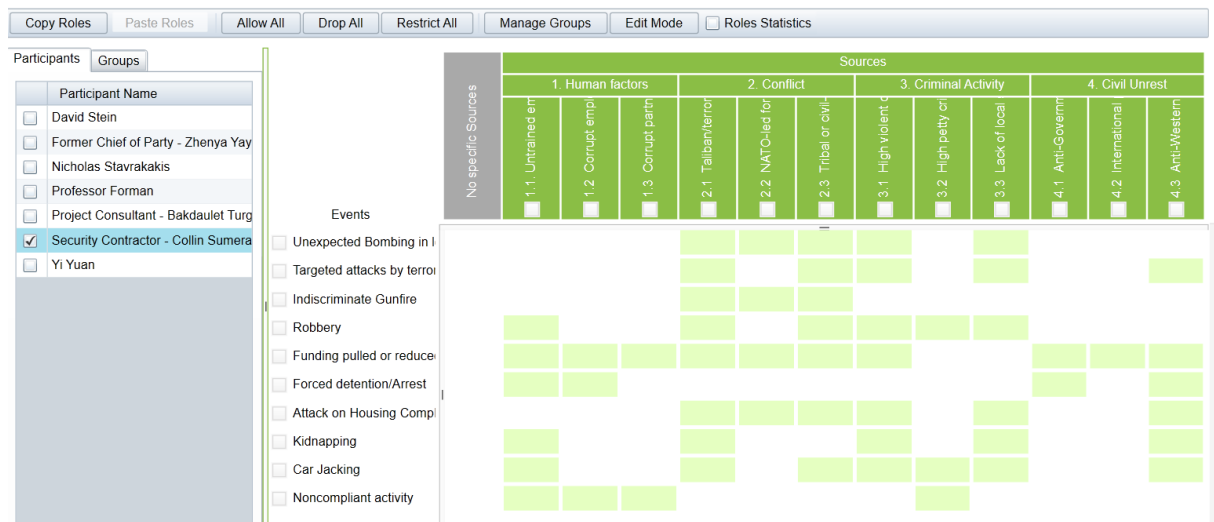


Figure 6: Example of One COMAC Participant's Role for Evaluating Risk Events

Likelihood of Events

With the two structures of identified events and their sources, we may begin to derive the likelihood of each event. We did so by identifying the links between the sources and the events they contribute to. As mentioned earlier, some sources may cause more than one event. A grid was used to make the task easier to complete and visualize.

Events	Sources/Threats											
	1. Human factors			2. Conflict			3. Criminal Activity			4. Civil Unrest		
	1.1. Untrained employees who may not follow security and safety policy and/or procedure	1.2. Corrupt employees who purposeful do not follow project policies and procedure	1.3. Corrupt partners/s	2.1. Taliban presence or movement in area.	2.2. NATO forces presence or movement in area.	2.3. Tribal or civil-infight that could lead to violence among local communiti	3.1. High violent crime in area	3.2. High petty crime in area	3.3. Lack of local security	4.1. Anti-Gove demonstra	4.2. International political stalemate/apathetic to project goals/obje	4.3. Anti-Western demonstra
Targeted attacks by terrorists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forced detention/Arrest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attack on Housing Complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kidnapping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unexpected Bombing in local areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indiscriminate Gunfire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Robbery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Funding pulled or reduced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Jacking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Noncompliant activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 7: COMAC Vulnerabilities Grid

The grid in figure 7 outlines the vulnerabilities our project is exposed to. As it illustrates, the events on the left each have multiple sources that may or may not trigger them. The following charts, which are parts of what's called a Bow-Tie diagram, show the direct connections between individual sources (in green squares) and risk events (in the circles), and vice versa.

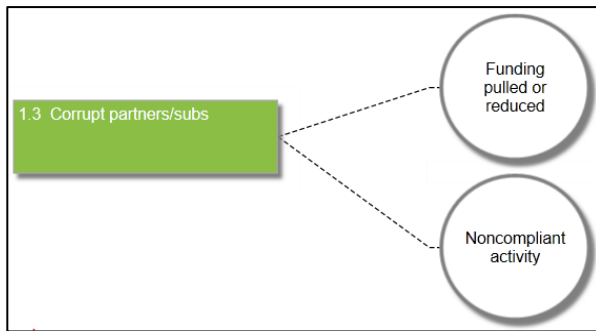


Figure 9: Events that are Vulnerable to a Specific Source



Figure 8: The Multiple Sources Connected to One Event

With this foundation, the participating group of experts began the process of deriving the likelihoods of the events and their threats. They used Pairwise Comparisons to turn their decisions into mathematically meaningful data. By using the AHP fundamental verbal and ranking scales, the evaluators were asked to provide ratios, as opposed to arbitrary nominal, ordinal or interval values.

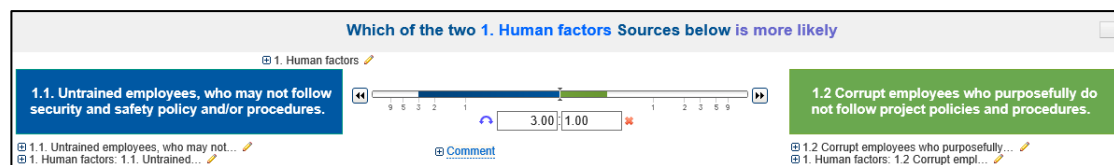


Figure 10: Pairwise Comparison to Determine the Likelihood of One Source Over Another

With ratio values, each source and event can be measured against one another using one's best judgements, if linked on the vulnerability grid. When history can be applied using hard data, then a Pairwise Comparison with Probability is possible. For this analysis, we were able to deduce a likelihood of 0.27% of an attack taking place on a housing complex, given that armed insurgents are in the area. This is based on the fact that recently there's been at least one attack on a western organization's villa or group housing complex per year.

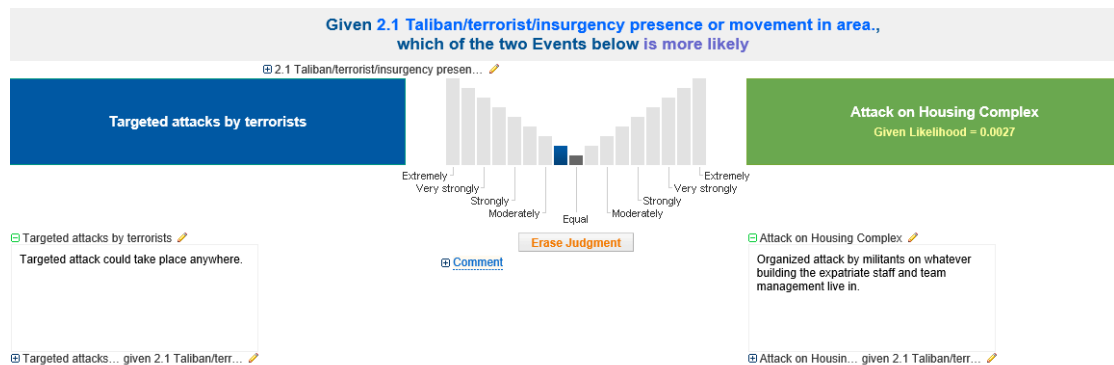


Figure 11: Pairwise Comparison with Probability

The data provided by all the evaluator's judgements, historical likelihood of attack on a housing complex, and logic of the AHP system, was synthesized to develop hierarchy of events by likelihood, shown in figure 12.

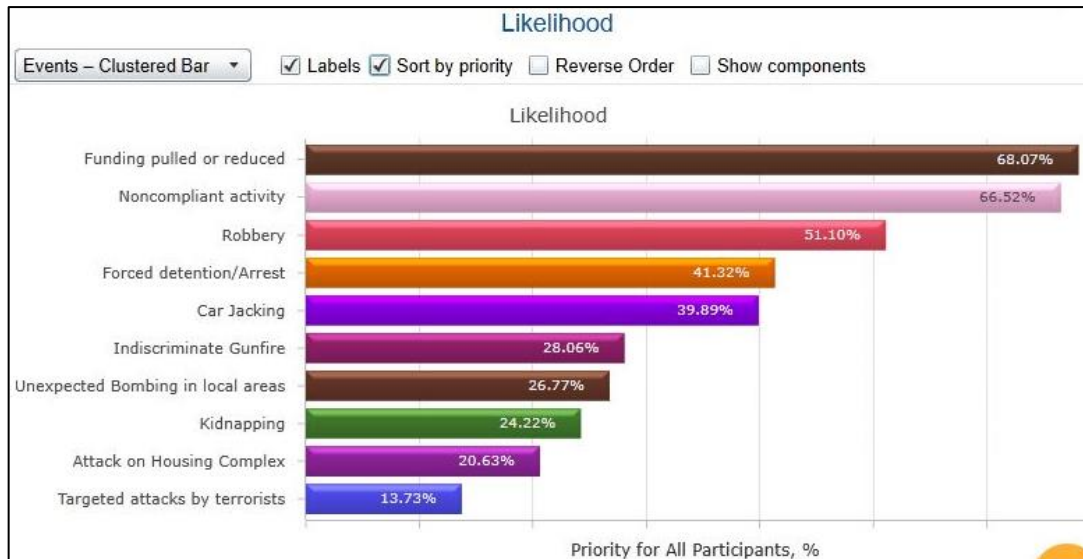


Figure 12: Hierarchy of Risk Events by Likelihood

Based on all of the evaluations on the likelihood of the events in relation to their particular sources and one another, Riskion has derived this hierarchy of risk events' likelihoods. As the graph demonstrates, there is a 68.07% likelihood of the risk event "Funding pulled or reduced."

Riskion can also show the likelihoods of each risk event in relation to a specific source clusters, or individual sources themselves. Figure 13 shows the hierarchy of events in relation to the cluster of Human Factor sources. Notice how the events associated are ones that the staff of COMAC and its subs can effect. This is very important to understand, as it is one of the sources the organization can mitigate by performing due diligence during its hiring and sub-award phases.

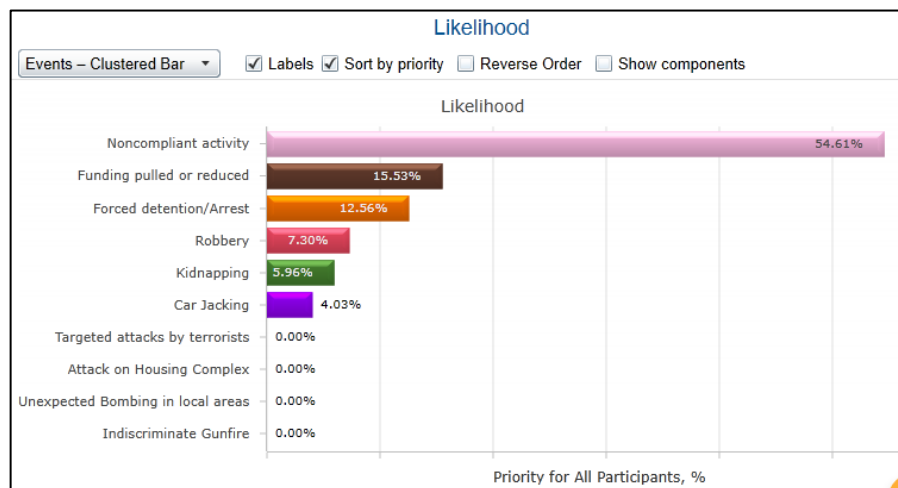


Figure 13: Likelihood of Events with Respect to Human Factors (Sources)

It's important to note that these likelihood hierarchies are only part of the risk analysis. For instance, the least likely event overall (see figure 12) is a "Targeted attack by terrorists," with a 13.73% chance of happening. Being relatively low to a noncompliant activity being committed (the second highest likelihood at 66.52%) does not mean it should be worried about less, or has a lower importance. It is important to understand how the effects, or impacts, of each risk event are quite different from one another.

Impact on Objectives

The process to measure the degree of impact that each event may cause is similar to the method of determining their likelihoods: through comparisons and rankings. As with the vulnerability grid, a matrix to provide the linkages between the events and objectives is required. The matrix in figure 14 is called an Impacts Grid.

Events	Objectives						
	Successful Project			Maintain Personnel Safety and Security		Secure Physical Assets	
	Meet >95% of Project Objectives	Enhance Reputation	Retain Talented Employees	Prevent Personnel Injury	Prevent Personnel Death	Maintain Fully Operational Vehicle	Maintain Fully Operational Equipment
Targeted attacks by terrorists	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Forced detention/Arrest	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attack on Housing Complex	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Kidnapping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unexpected Bombing in local areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Indiscriminate Gunfire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Robbery	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Funding pulled or reduced	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Car Jacking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Noncompliant activity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 14: COMAC Impacts Grid

The same evaluators used pairwise comparisons once again. However, no given data was available at the time, so no pairwise comparisons with given probability was provided. As with the earlier measurement of likelihoods, the data provided by the judgements, and logic of the AHP system, was synthesized to develop the following hierarchy of objectives.

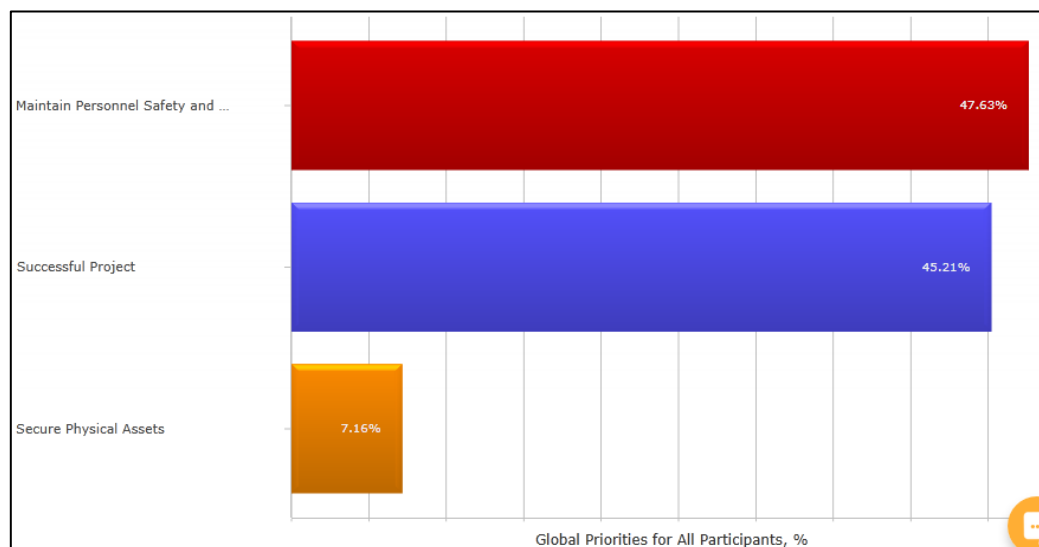


Figure 15: COMAC Objective Cluster Priorities

Synthesis

Synthesis is a very important tool to assess the evaluation results. Different measurements provide mathematical meaning for results and we can look deep into these data. One of the most powerful tools of Synthesis is sensitivity analysis. By changing certain factors on each variable, we can find out what impact these variables have on the results. This will give us the “What If” assumption and helps us make sure our understanding is the same or similar to the expected results. In this project, we performed sensitivity analysis for both likelihood of events and impact of events.

Likelihood of Events

By conducting a Dynamic Sensitivity Analysis, we can see how the likelihood of sources impact the given events. As an example, we focused on the Source/Threat “Conflict” in figures 16 and 17 below. The results show that “Tribal or Civil-infighting” contributes to nearly 50% of the source cluster, and is the largest sub-source. If we reduce “Tribal or Civil-infighting” from 50% to 30%, meaning we decrease this source’s probability by 20%, the overall likelihood of all events drops. However, not all events drop at the same rate. The likelihood of a “Robbery” event has gone from 7.6% to 4.74%, but the “Unexpected Bombing” event only drops from 19% to 18%, which shows that it is much less sensitive to “Tribal or Civil-infighting” changes. Therefore, we can conclude that a decrease in “Tribal or Civil-infighting” would cut back on robberies and other minor crimes, but won’t help too reduce bombings. This makes sense because bombing attacks are usually related to terrorism, and petty crimes, which we learned are usually committed by different sectarian groups to fund their militias and powerbases, do not involve bombings.

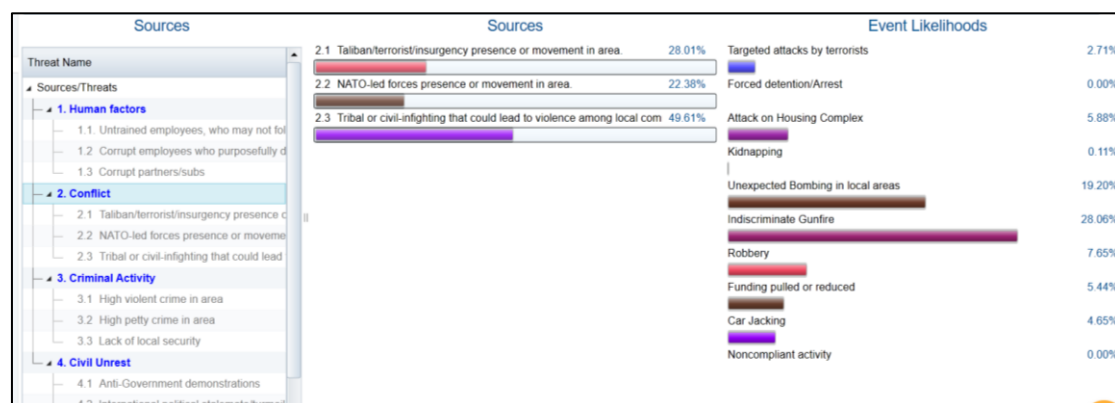


Figure 16: Example of Current Dynamic Sensitivity Showing Sources/Threats (Conflict) and Event Likelihoods

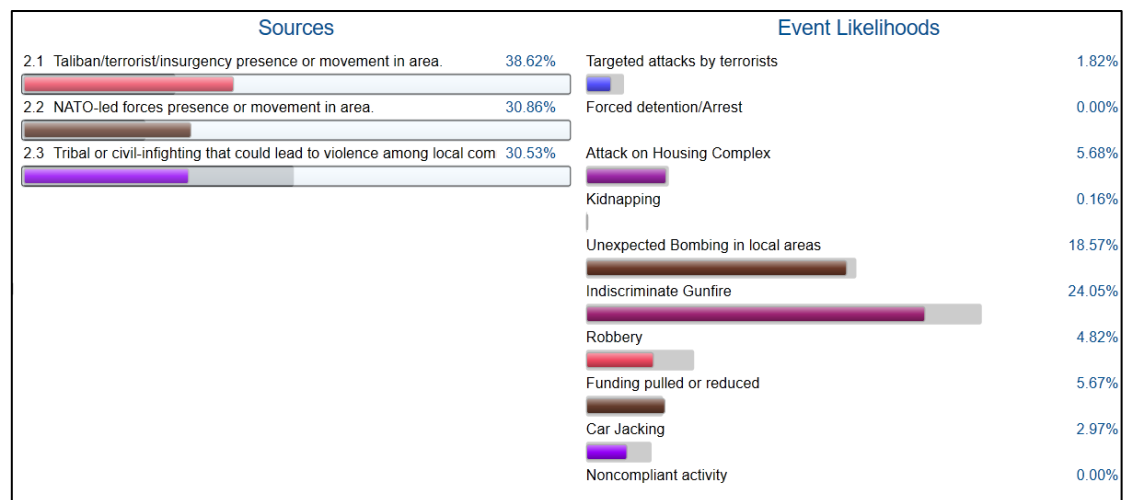


Figure 17: Example of Dynamic Sensitivity Showing Sources/Threats (Conflict Decreased to 30%) and Event Likelihoods

We then used the Performance Sensitivity analysis on the “Human Factor” cluster, and tested how the events change with respect to these sources on overall performance. By shifting the “Untrained Employee” bar up and down, the event of “Funding Pulled” changes significantly. In addition, Figure 19 shows the likelihoods of all events with respect to every source. The overall priority of events is “Funding Pulled” at 68.07%. “Untrained Employee” has the highest priority with regards to likelihood of source, which is relatively strong compared to other sources, such as “NATO movement in area”.

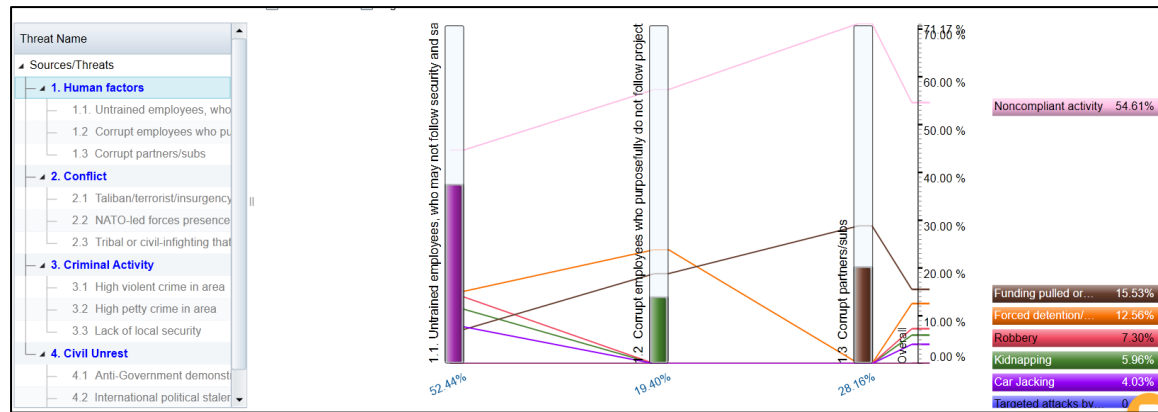


Figure 18: Performance Sensitivity Showing Sources/Threats (Human Factor) and Event Likelihoods

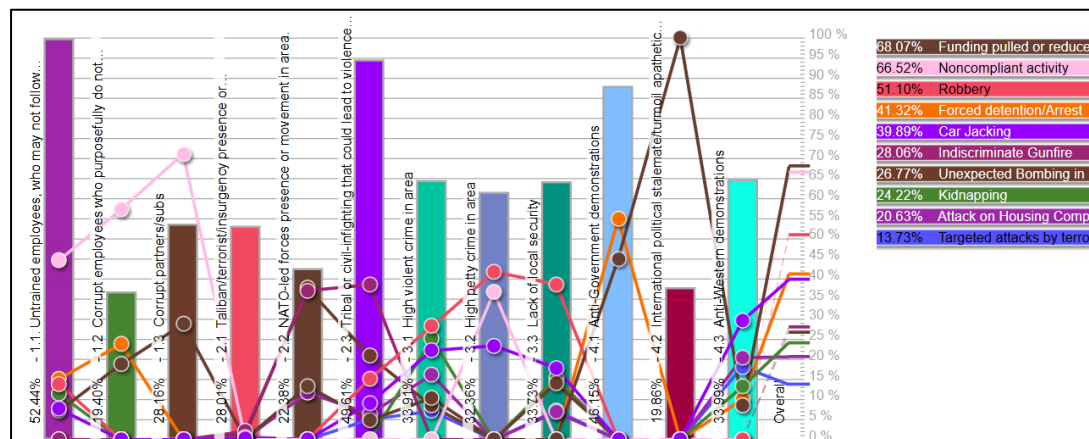


Figure 19: Sensitivity Chart Showing all Sources/Threats and Event Likelihoods

Impact of the Events

Sensitivity analysis can also evaluate the impact of events. By using the Dynamic Sensitivity analysis in Riskion, we can show how objectives affect event impacts. The evaluations give us the priority ranking of events impact. We see that the “Successful Project” and “Maintain Personnel Safety” objective clusters have much higher priorities than “Secure Physical Assets”. This makes sense because the organization values human loss over property loss, and equipment can always be replaced, as opposed to another opportunity at a grant.

The risk event “Targeted attacks by terrorist” has the highest impact on both the “Successful project” and “Personnel Safety” objectives. Figure 21 illustrates how if we increase the importance of “Personnel Safety”, the “Targeted attacks by terrorist” event’s impact increases far more than other events. This shows the strong correlation between events such as “Terrorist attack” and “Housing Complex Attack” and amount of loss, or impact, on “Personnel Safety”. Without a sensitivity analysis, we might lose sense of the importance of specific events in achieving certain objectives.

Figure 22 shows the Performance Sensitivity Analysis of Objectives and Event Consequences. By increasing the “Successful Project” bar, we find out which events are most associated with it, such as “Noncompliance Activity”, and their priorities increase significantly. This will give us an idea of what events are more likely to be affected by a specific objective.

Moreover, Figure 23 shows the Objective Components of each event. For instance, the event “Forced Detention” has a strong impact on the “Successful Project” objective, while “Indiscriminate Gunfire” has a higher relationship with “Personnel Safety”.

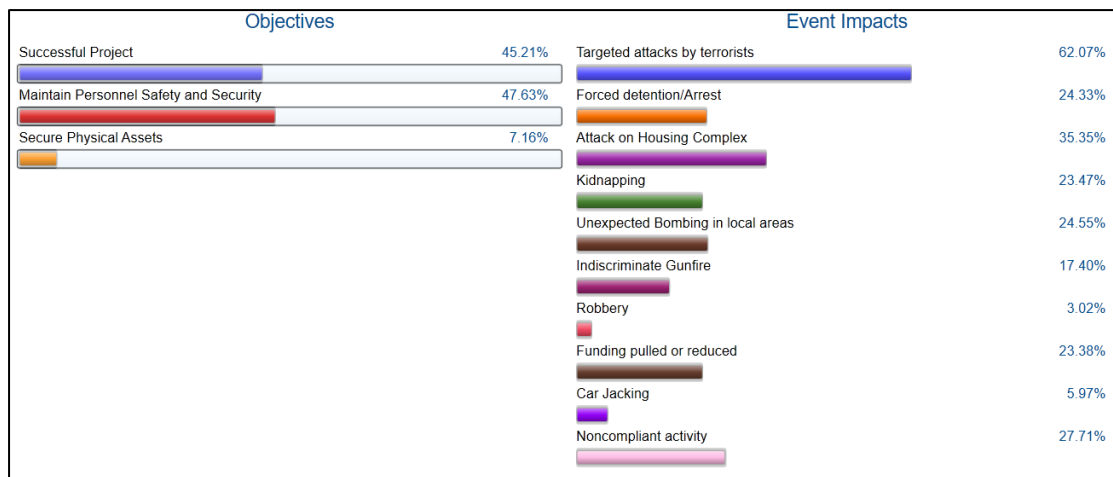


Figure 20: Dynamic Sensitivity Showing Objectives and Event Impacts

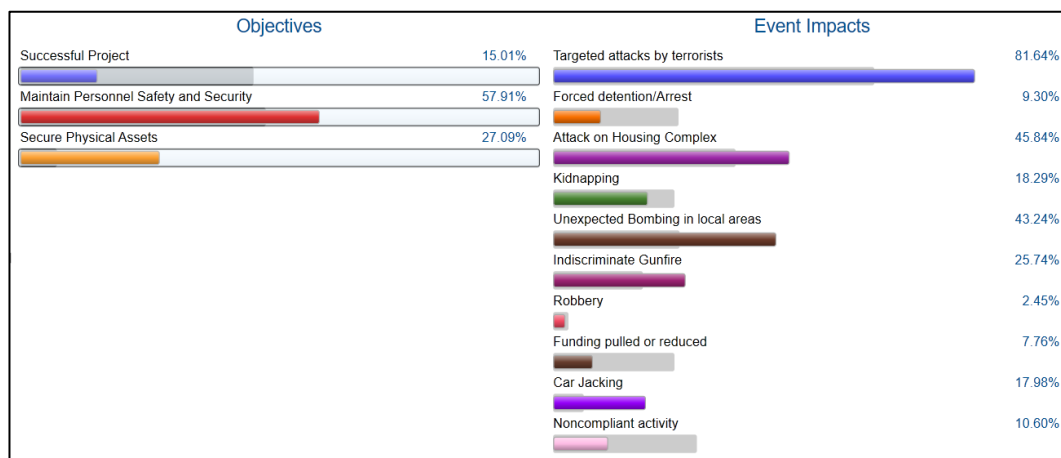


Figure 21: Dynamic Sensitivity Showing How Event Impacts Change When "Maintain Personnel Safety" Objective Increases

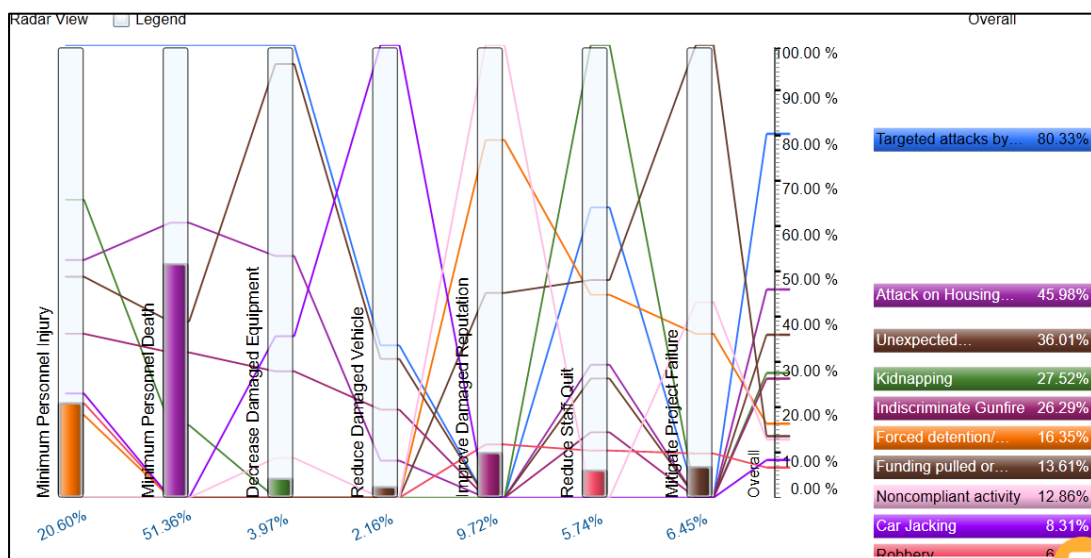


Figure 22: Performance Sensitivity Showing Objectives and Event Consequences

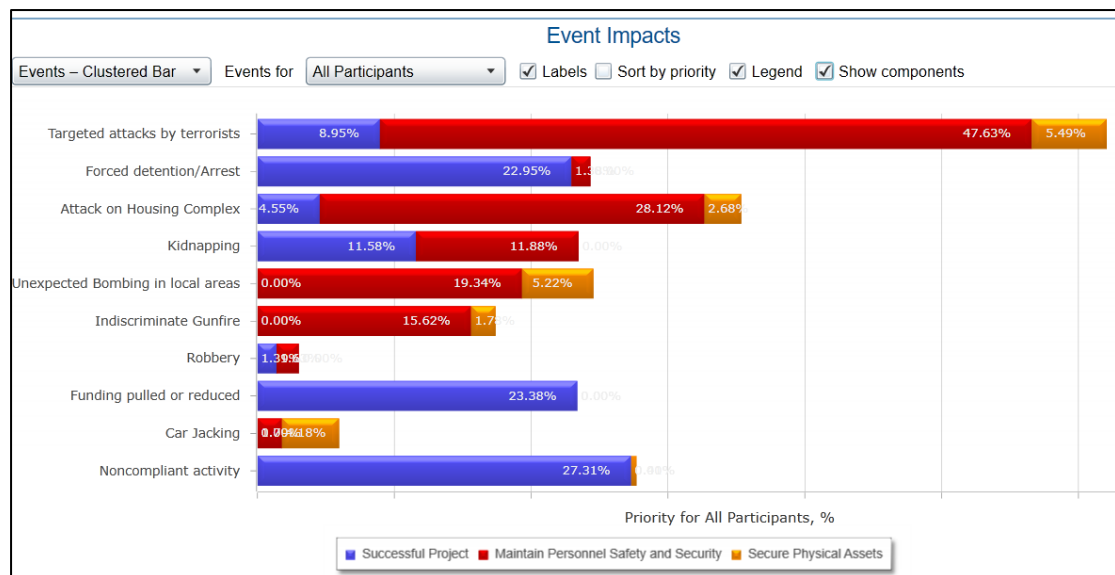


Figure 23: Overall Events with Respect to Their Objectives Components

These sensitivity analyses have provided a great deal of confidence in the model and judgements, as the relationships between the sources, events and objectives that they display are in line with what seems logical. Because of this, we chose not to make any iterations, or changes to the model, which would have been necessary if the results had not been logical or expected.

Risk

In this project, Risk is defined as an unexpected event or uncertainty that results in a loss. After identifying the likelihood of the events and impact of the events, we will be able to find out what are COMAC's risks and what sources are related to them.

Risk Map

The Risk Map in figure 24 is a graphical presentation of risk events that represent the likelihood and impact of risk events. The vertical axis is the impact of the risk event in percentage of the total loss. The horizontal axis is the likelihood of the risk event, also as a percentage. The size of the bubbles represents the assessment of the risk events. The larger the bubble, the higher likelihood and impact of that risk on the project. This in turn shows which event risks should have a higher priority and be taken care of.

If the size of a specific bubble is small, that event won't have much of an impact on our project, and therefore will be a lower priority. These provide us with an idea of what we need to focus on, and controls need to be sought and implemented to the sources and/or consequences that are related to the high priority risk events.

From figure 25 below, we see the two largest bubbles are events #10 Noncompliant Activities, and #8 Funding Pulled or Reduced. The associated monetary risk⁴ loss of Noncompliant Activities is \$7.37 million, and \$6.36 million in losses is associated with Funding Pulled or Reduced. Therefore, we should focus on these events and find out what related sources/threats are.

⁴ The monetary amounts are based on the RFA's total value of \$40 million.

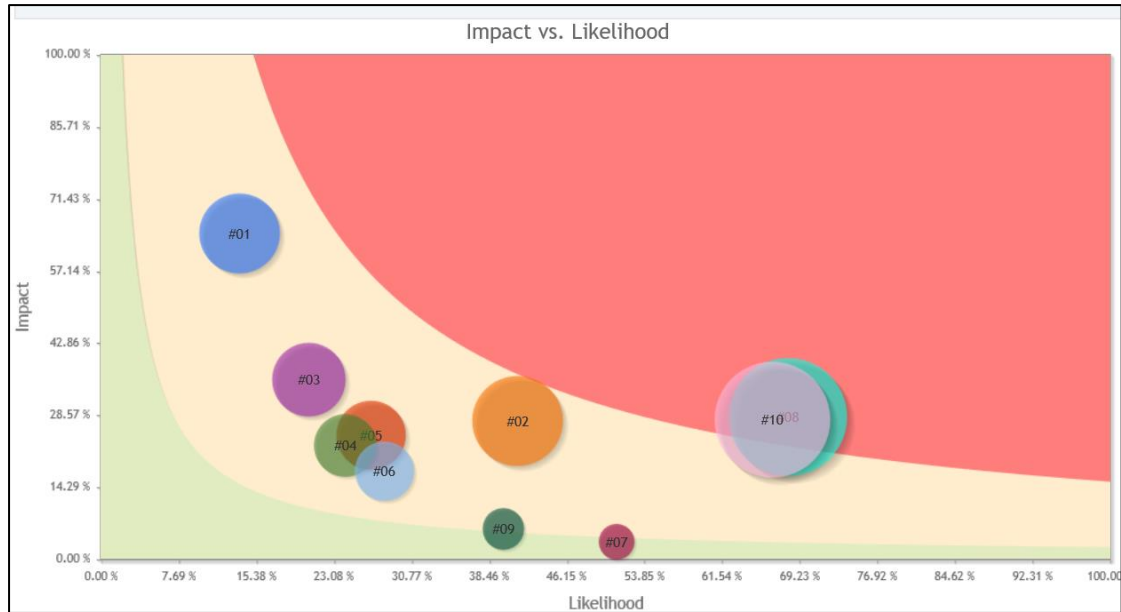


Figure 24: The COMAC Risk Map, Showing the Impact VS. Likelihood

Events				
No.	Name	Likelihood	Impact, \$	Risk, \$
#10	Noncompliant activity	66.52%	\$11.09M	\$7.37M
#08	Funding pulled or reduced	68.07%	\$9.35M	\$6.36M
#02	Forced detention/Arrest	41.32%	\$9.73M	\$4.02M
#01	Targeted attacks by terrorists	13.73%	\$24.83M	\$3.41M
#03	Attack on Housing Complex	20.63%	\$14.14M	\$2.92M
#05	Unexpected Bombing in local areas	26.77%	\$9.82M	\$2.63M
#04	Kidnapping	24.22%	\$9.39M	\$2.27M
#06	Indiscriminate Gunfire	28.06%	\$6.96M	\$1.95M
#09	Car Jacking	39.89%	\$2.39M	\$952,604.00
#07	Robbery	51.10%	\$1.21M	\$618,316.80

Figure 25: Risk Priority Matrix

Risk Results

To obtain more accuracy, we ran a simulation 10,000 times as independent variables. The Loss Exceedance Curve below shows that COMAC's Value at Risk is \$29.97 million. This means that there is only a 5% chance our total loss will exceed \$29.97 million. This will give us a good risk analysis before we apply controls.

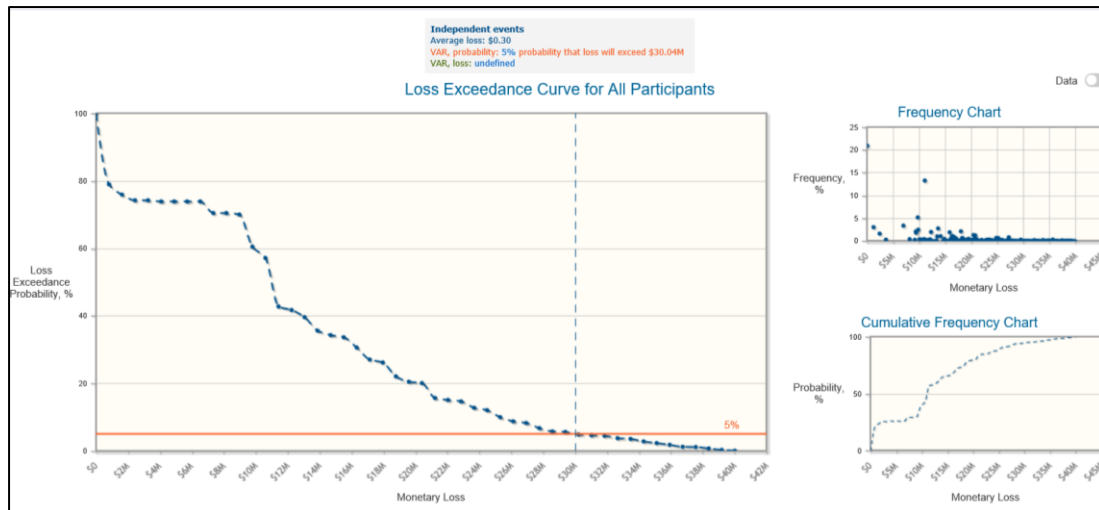


Figure 26: Loss Exceedance Curve for All Participants (10,000 Simulation)

In Figure 25 above, we showed the monetaty value of risks for each event. With the simulation applied, the table in figure 27 displays the likelihood, impact, and, most importantly, the overall Risk for each event.

No.	Event		Likelihood Simulated	All Participants Impact, \$ Simulated	Risk, \$ Simulated
#10	Noncompliant activity	≡	39.93%	9,971,112.79	3,981,465.34
#08	Funding pulled or reduced	≡	11.71%	8,157,694.32	955,266.01
#02	Forced detention/Arrest	≡	20.32%	8,397,101.39	1,706,291
#01	Targeted attacks by terrorists	≡	4.39%	21,171,640.40	929,435.01
#03	Attack on Housing Complex	≡	6.36%	13,342,791.75	848,601.56
#05	Unexpected Bombing in local areas	≡	13.68%	9,262,397.85	1,267,096.03
#04	Kidnapping	≡	10.89%	8,557,158.96	931,874.61
#06	Indiscriminate Gunfire	≡	17.06%	6,735,423.70	1,149,063.28
#09	Car Jacking	≡	8.89%	2,227,585.37	198,032.34
#07	Robbery	≡	14.39%	1,163,099.72	167,370.05
			Total Risk: \$32,514,062.86		
			Average Loss: \$12,134,495.22		

Figure 27: Overall Likelihoods, Impacts, and Risks for COMAC

By looking deep into the bow-tie diagram, we find that the “Noncompliant Activity” event has a 66.52% likelihood to happen, which is pretty high. The major contributing sources for the “Noncompliant Activity” are “Untrained employee” at 23.44%, and “Corrupt Partners” at 20.04%. This means that the majority of causes to the Noncompliant Activity are Untrained employees and Corrupt Partners. This result makes a lot of sense, because any untrained employee not fully familiar with procedures makes them more likely to make errors in protocol or compliance during the mission. And oversight on sub-partners is never as effective as oversight on one’s own staff.

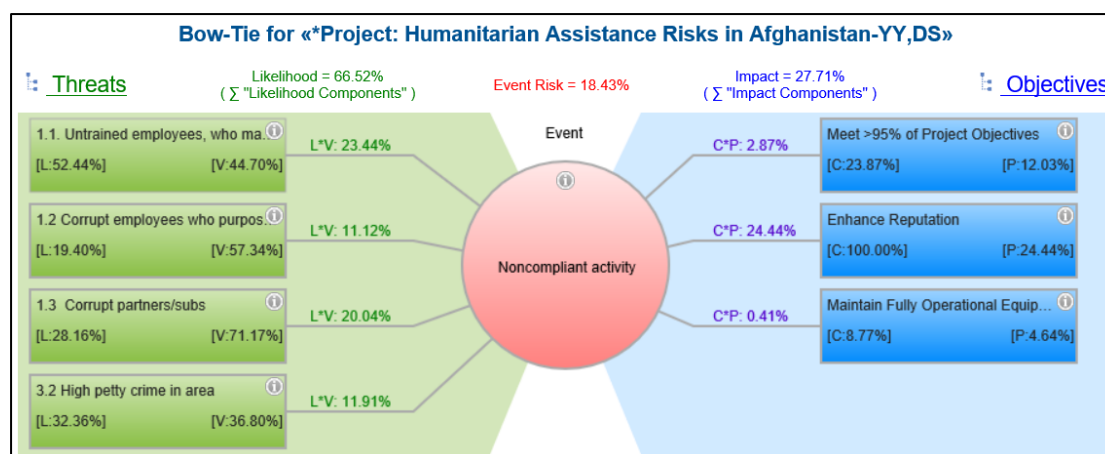


Figure 28: Risk Bow-Tie Diagram for "Noncompliant Activity"

Controls

The proposal team intends to include actions to reduce the threat levels to a tolerable level in the budget proposal. Risk controls should be identified and implemented to reduce the following: a) the likelihood of sources; b) the likelihood of risk events given their sources; and, c) the total impact the risk events have upon the objectives. The ceiling for implementing risk controls has been set to \$4 million, or 10%, of the total grant amount.

In order to mitigate the risks COMAC is exposed to, we reviewed the vulnerabilities and impacts of each source and risk event. We searched for and discovered several areas that could either be managed or prevented through proper action and safeguards. The following are the identified controls:

Index ▲	<input type="checkbox"/>	Control Name	Control for
01	<input type="checkbox"/>	Increase Cooperation with Local Government	Threat ▼
02	<input type="checkbox"/>	Hire Compliance team for regular review	Threat ▼
03	<input type="checkbox"/>	Hire Risk Management Specialist	Vulnerability ▼
04	<input type="checkbox"/>	Hire Local Security Team	Vulnerability ▼
05	<input type="checkbox"/>	Hire International Security Contractor	Vulnerability ▼
06	<input type="checkbox"/>	Restrict Staff movement	Vulnerability ▼
07	<input type="checkbox"/>	Rent Office-lodging in highly secure complex	Vulnerability ▼
08	<input type="checkbox"/>	Comprehensive Security Plan updated regularly	Consequence ▼
09	<input type="checkbox"/>	Armored Vehicles	Consequence ▼
10	<input type="checkbox"/>	Provide body armor	Consequence ▼
11	<input type="checkbox"/>	Top of the line health and evacuation insurance	Consequence ▼
12	<input type="checkbox"/>	Internal Audit to prevent corruption	Consequence ▼
13	<input type="checkbox"/>	Safety Training for Staff	Consequence ▼
14	<input type="checkbox"/>	Buy Life insurance for staff	Consequence ▼

Figure 29: Potential Controls for COMAC

The controls identified are, for the most part, standard ones for projects like COMAC. The two project managers received price quotes and information on the effectiveness of each control, and used their judgements to enter them into Riskion. They are divided by what and

how they work into the following categories: Controls for Threats (Sources), Controls for Vulnerabilities (Events), and Controls for Consequences (Impacts).

Controls for Threats

Only two controls for sources were identified: increase cooperation with the local government, and hire a compliance team for regular reviews. Partnering with local authorities may increase security in the area, or provide extra intel that would make working in the environment easier. Although there's no ticket price for this, it will require time and resources, which is expected of the project anyway. The other control, which includes the salaries, fringe, and other expenses of expert compliance support, could help truthful employees understand compliance issues earlier on, and mitigate the intent of others intending to take advantage early on.

Controls for Vulnerability

Five controls were identified to mitigate vulnerabilities, or the likelihood of an event from taking place with regards to a specific source. Restricting staff movement is simply a policy that, if enacted, would prevent non-local personnel from leaving any safe areas, mitigating the likelihood that an event would take place near them. As a policy, it would not cost anything.

The other controls for vulnerability involve high costs, as they include: a) hiring local and/or international security personnel and teams, both in the field and in the home office. These different add-ons provide multiple services, including security planning, intel, and physical protection and escort; and, b) renting office and lodging spaces in a highly secured camp, designed for such projects. These types of controls would be greatly helpful in reducing the likelihoods of events taking place, even with highly likely sources, as they are designed to navigate through the threats.

Controls for Threat Likelihoods								
Control Name	Sources/Threats							
	1. Human factors			2. Conflict			3. Criminal Activity	
	1.1 Untrained employees, who may not follow security and safety policy and/or procedures.	1.2 Corrupt employees who purposefully do not follow project policies and procedures.	1.3 Corrupt partners/subs	2.1 Taliban/terrorist/insurgency presence or movement in area.	2.2 NATO-led forces presence or movement in area.	2.3 Tribal or civil-infighting that could lead to violence among local communities.	3.1 High violent crime in area	3.2 High petty crime in area
1. Increase Cooperation with Local Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Hire Compliance team for regular review	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 30: Example of Controls for Sources

Controls for Consequences

Six controls are specifically designed, and could be implemented, to reduce the impact of the risk events on the objectives. These include the following: a) conducting internal audits on a yearly basis to identify past, present and potential mistakes in the project's operations and administration, remedy any noncompliance issues, and strengthen safety protocols, before they cause external issues; b) provide security gear and equipment, i.e. body armor and armored vehicles, that would mitigate any damage to personnel and/or equipment should a violent event occur; c) security plans and trainings, which would help personnel know the best way to react in certain events; d) specialized medical plans that could reduce the impact of physical injuries from events; and, e) life insurance, which may mitigate certain losses financially.

Value of Controls

Based on the judgements, data, and logic of the AHP methodology, the Riskion software package is able to demonstrate the true value of a control. For instance, the bow-tie diagram in figure 31 shows the likelihood of a noncompliant activity risk event taking place with respect to human factors. The biggest source to this type of event, it has a 54.61% of taking place, and the event risk could potentially add up to a loss of \$6.05 million.

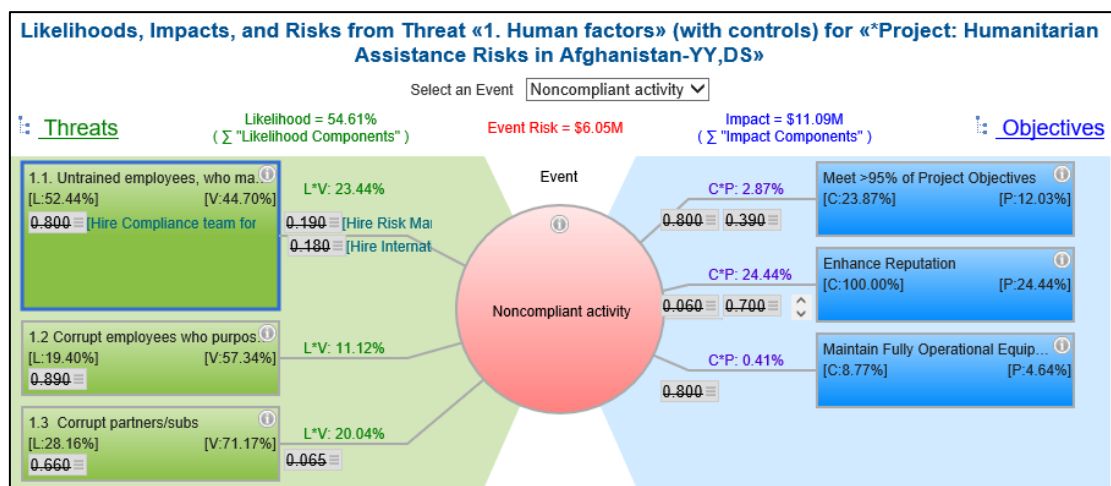


Figure 31: Bow-tie Diagram of Noncompliant Activity Event w/o Controls

However, by putting this one control in place, the likelihood of the source, and therefore risk, drop significantly:

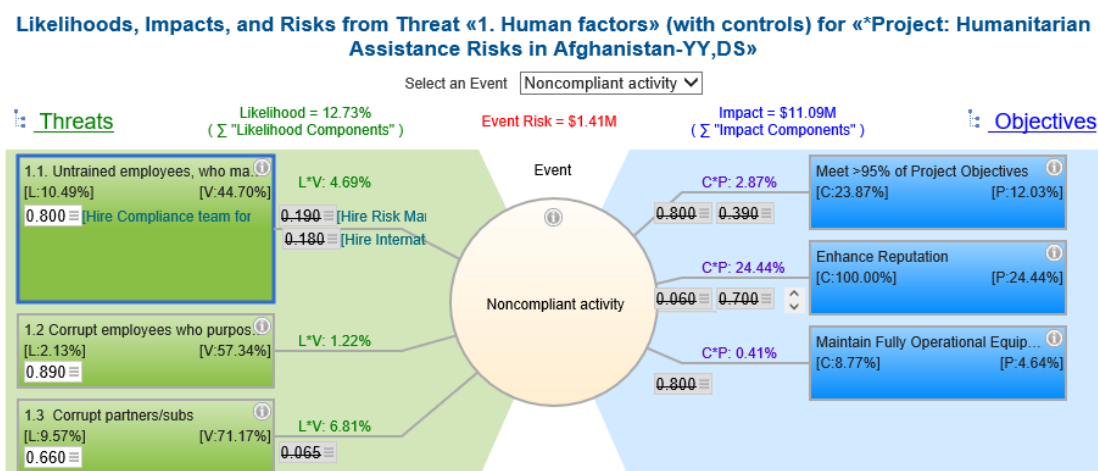


Figure 32: Bow-tie Diagram of Noncompliant Activity Event w/o Controls

The likelihood of these sources, and therefore the event with regards to them, have all decreased. Now, the associated event's risk has dropped from \$6.05 to \$1.41 million, or approximately 77%.

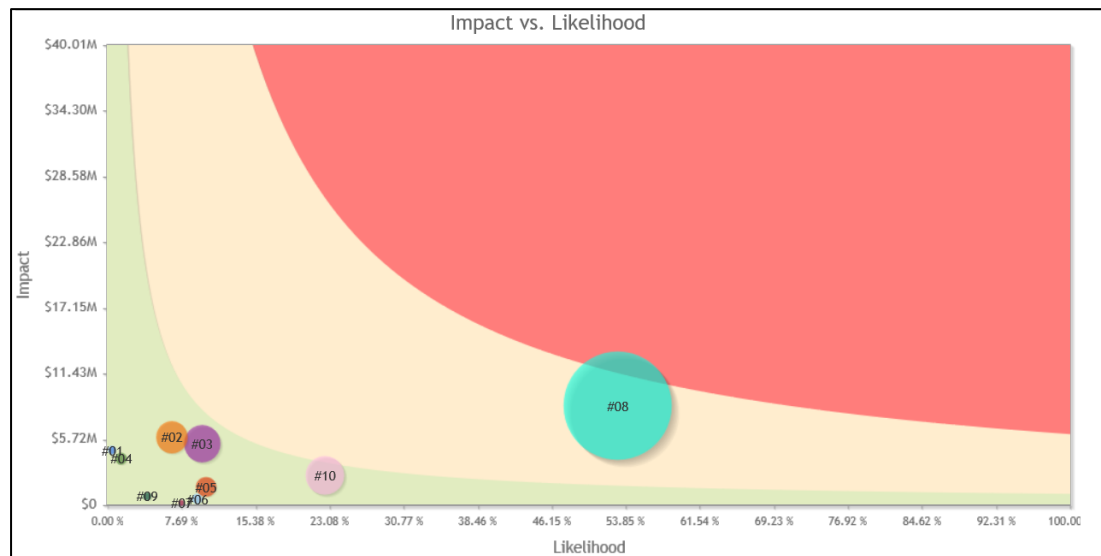


Figure 33: Overall Risk Map with Controls- Impact VS. Likelihood

Together, these controls can significantly reduce the risks. When compared to figure 24, the new risk map above in figure 33 shows both decreased likelihoods and impacts across the board. The total cost for all controls is \$5.9 million. Together, they are able to reduce total risk from 81.29%, which is equivalent to \$32.5 million, to 15.93%, equivalent to \$6.4 million. That would be a risk reduction of 80.4%!

ID	Event Name	Likelihood	Impact	Risk	Likelihood with controls	Impact with controls	Risk with controls
1	Targeted attacks by terrorists	13.73125	62.07097	8.52312	0.53119	11.77316	0.06254
2	Forced detention/Arrest	41.31835	24.33488	10.05477	6.71899	14.69452	0.98732
3	Attack on Housing Complex	20.62796	35.35487	7.29299	9.85254	13.27698	1.30812
4	Kidnapping	24.22371	23.46714	5.68461	1.45404	9.99314	0.14530
5	Unexpected Bombing in local areas	26.77444	24.55271	6.57385	10.26003	3.81141	0.39105
6	Indiscriminate Gunfire	28.05823	17.40042	4.88225	9.38016	1.12566	0.10559
7	Robbery	51.10417	3.02479	1.54579	7.74270	0.42874	0.03320
8	Funding pulled or reduced	68.07338	23.37541	15.91243	53.02863	21.45078	11.37505
9	Car Jacking	39.89041	5.97013	2.38151	4.14143	1.79724	0.07443
10	Noncompliant activity	66.51729	27.71285	18.43384	22.61785	6.39209	1.44575

Figure 34: Risk Register with and w/o Controls

Optimization & Recommendation

Unfortunately, the budget limit does not allow us to implement all known controls, at least for the proposal. Some of the controls, such as health insurance, are mandatory, and required by the cooperative agreement, but most of them are not. Therefore, we used the AHP system and Riskion to derive the optimal selection of controls within budget constraints.

Controls optimization for "Project: Humanitarian Assistance Risks in Afghanistan-YY,DS"

☒ Budget
 ☐ Risk
 ☐ Risk Reduction

Budget Limit: \$

Total Risk: **81.29%**
 Risk With Selected Controls: **16.18% (Δ: 65.10%)**
 Risk With All Controls: **15.93% (Δ: 65.36%)**
 Total Risk Reduction: **80.09%**

Selected controls: **13**
 Cost Of Selected Controls: **\$3,213,051 (unfunded: \$2,640,000)**
 Total Cost Of All Controls: **\$5,853,051**

Figure 35: COMAC's Risk Amount with Controls

Using the AHP model and all the data and judgements provided for sources, events, objectives, likelihoods, impacts, and controls, the system selected every control available but one: “Rent Office-Lodging in Highly Secure Complex”. This control would require an additional \$1.9 million over the safety and security limit, but only provide an additional 0.25% of an overall risk reduction to the project. With the others controls implemented, the overall inherent risk that COMAC faces, which is calculated to be 81.29%, will be reduced to 16.18%. All at a cost of \$3.2 million.

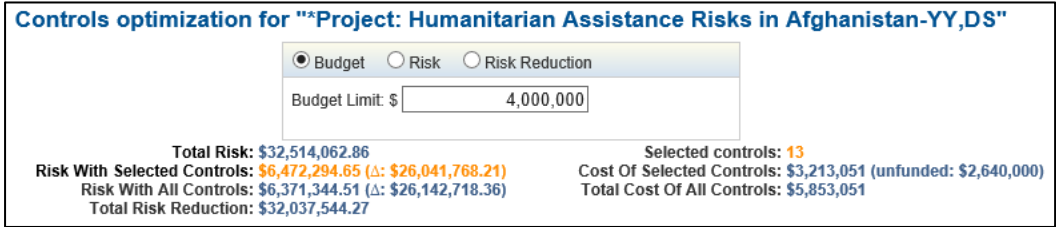


Figure 36: Monetary Value of COMAC's Risks with Controls

Therefore, we suggest to move forward with the optimal scenario provided by Riskion. The \$0.8 million savings from not selecting the office and lodging space in an expensive location would be better used in renting a villa in a more secured neighborhood, and keeping the rest for contingency and emergency funding.

Annex A: Risk Event Details

- Unexpected Bombing in Local Areas. Such attacks have, most recently, been attributed to different armed opposition groups, including the Taliban, ISIS, and other non-ANSF or NATO militant forces, in the form of car bombs, IEDs, and explosive belts, used by suicide bombers. However, the bombing could also come from artillery fire, guided missiles and airstrikes by ANSF or NATO forces⁵ that would be considered “friendly-fire”. The primary target of the bombing is neither COMAC nor COMAC partners.
- Indiscriminate Gunfire. This event would entail either a gunfight between two opposing sides, or a terrorist attack where an extreme agent opens-fire in a public space. In either case, neither COMAC nor COMAC partners are specifically targeted.
- Attack on Housing Complex. In such a case, the structure that houses COMAC’s international staff, international subcontractors/grantees, and administrative office space is targeted and attacked by armed, militant actors. COMAC and/or COMAC partners sharing the space are the primary target of the attack, which could include the use of explosives and gunmen.
- Targeted Attack by Terrorists. This event would involve an attack on COMAC and/or COMAC partner staff and/or assets by armed militants. This type of event excludes organized attacks in or on the housing complex. Could include the use of targeted bombings or gunfire.
- Kidnapping. The abduction, typically by force, of a COMAC or COMAC partner staff member(s). Could be committed for terrorism-related reasons, and also with criminal intentions, in order to collect ransoms.
- Forced Detention/Arrest. In such an event, a COMAC or COMAC partner staff member(s) is abducted or arrested by official authorities who work within local or international laws. Such detentions may be due to a violation of some sort, either rightfully or unrightfully so.
- Robbery. Could include muggings, office break-ins, and grand theft auto by criminals. Results in the loss of personal and/or COMAC property.
- Carjacking. Defined as “the action of violently stealing an occupied car.” In such cases, the automobile would be targeted by criminals for its physical value.
- Noncompliant Activity. An internal infringement of the policies and procedures governing the cooperative agreement with USAID. Could happen with or without intent. May or may not result in safety issues for the COMAC staff and assets, but could result in losses to the project’s operations, finances, and overall goals.
- Funding Pulled or Reduced. The agreement will have a number of mechanisms within it that could reduce the amount of funds provided for the implementation of COMAC. Awarded amounts are different from obligated amounts which are increased according to milestones, and even so, USAID could demand reimbursement for already spent funds. Such an event could have dire results for the overall project.

⁵ For instance, the 2015 accidental bombing of a Doctor’s Without Borders managed hospital in Kunduz, Afghanistan, by the US Air Force.