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Seminar on Case Studies in Operations Research

Supporting peace mediation with expert
assessments of stakeholders relationships

FINAL REPORT

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1 Introduction

The Crisis Management Initiative (CMI) is a peace mediation organization. Peace mediation activities are specific peace building actions that aim to bring together and facilitate two or more conflict participants to negotiate on the non-violent solutions of the conflict. (Anon., 2014) In this project our task, broadly defined, was to study how the outcomes of peace mediation and dialogue can be assessed by taking an analytical systems perspective.

This final report describes a prototype procedure for collecting and analysing expert information on relationships of conflict stakeholders. This procedure aims to support the planning and monitoring of conflict resolution. Emphasis is on the use of the procedure in planning conflict resolution activities. The procedure helps generating a general view on the relations between conflict stakeholder groups. It consists of the following steps: 1. identifying the relevant stakeholder groups, 2. collecting expert judgments to assess the relationships of those groups and the attributes of those groups in several dimensions, 3. visualization and analysis of the data gathered in step 2.

The procedure developed here is a prototype version. It has been tested with CMI staff on a half-day workshop where it was used to assess the relations between stakeholder groups in Palestine conflict. This final report discusses the prototype procedure thoroughly. This involves explaining the logic of the procedure, clarifying the assumptions behind it, discussing its strengths and weaknesses, the potential uses and misuses of the procedure and discussing how it can be further developed.

Section 2 describes CMI, how it operates and discusses peace mediation. Section 3 explains a model that can be created from the expert data to analyse the conflict situation. Section 4 discusses the collection of expert data. Section 5 presents tools for visualization and analysis of the expert data. Section 6 describes how the prototype procedure was applied in the context of Palestine conflict. Section 7 discusses possible avenues for future development of the procedure. Section 8 concludes.

2 CMI and Peace Mediation

2.1 Conceptual background of peace mediation

Peace mediation has been recognized as an effective way for peaceful conflict resolution. It is a process where two or more conflict parties are brought together to prevent, manage or resolve conflict with the assistance of a neutral third party. Conflict parties participate in the mediation process voluntarily and a mediator has no authority to impose an outcome. The aim is to assist disputants to find mutually acceptable agreements, either consisting of a specific issue or tackling a broad range of affairs, which will contribute to containing and ending the conflict.

The nature of conflicts has been changing during the last decades. Instead

of pure inter-state conflicts an increasing number of the conflicts have an intra-state context which involves a more diverse group of conflict parties than before. In addition of government representatives and official state structures conflicts might involve for example insurgency groups, tribal leaders, religious authorities in unofficial and official sectors.

Because of the more complex conflict scene, efficient interventions require a close co-operation of a diverse group of mediators. Traditionally states and the United Nations have played a central role in global peace mediation. Beside these traditional actors have come an increasing number of regional and sub-regional organizations, e.g. the African Union and Organization for Security and Cooperation in Europe (OSCE), and private diplomacy actors (PDA), such as the Crisis Management Initiative and Carter Center. These new players bring added value by diversifying the field of peace mediation.

The influence of private diplomacy actors has been increasing and becoming more appreciated. They broaden the peace process by increasing participation in different layers of society. They can engage those non-governmental actors, such as grassroots and midlevel opinion leaders from the religious, tribal and business sectors and civil society, which official actors can not reach. Because of their role as an unofficial actor, PDAs are also able to perform confidential mediation behind the scenes. In addition, private mediation organizations can react situations more rapidly since they have less bureaucratic constrains. They can also go places and meet people that official representatives cannot or will not. Because of these benefits private diplomacy actors bring valuable support in efforts to maintain international peace and security. (Piiparinen and Brummer, 2012)

2.2 Crisis Management Initiative

Crisis Management Initiative (CMI) is a Finnish independent, non-profit conflict resolution organization. CMI was founded by President Martti Ahtisaari in 2000 and has since become one of the most trusted and recognised private conflict resolution organizations. The overall objective of CMI is to enhance sustainable development by preventing and resolving violent, political conflicts. CMI brings added value to conflict resolution by conducting unofficial mediation and dialogue processes to complement an official work. CMI is implementing its programme in Eastern Europe, Caucasus and Central Asia, the Middle East, North Africa and Sahel and Sub-Saharan Africa.

CMI has organized activities into three sub-programmes; mediation and dialogue, mediation support and support to states and societies in conflict prevention and resolution. The focus of the first sub-programme, mediation and dialogue, is to support the potential or existing peace process by directly engaging the conflict parties and other stakeholders with each other. CMI acts as an impartial, third-party facilitator providing a space for dialogue and negotiations. The specific objectives of this sub-programme are to increase trust between the conflict parties, develop channels for dialogue and capacities of conflict parties to engage in political negotiations. The second sub-programme,

mediation support, focuses on supporting other third-party mediators, such as states and multinational organizations, by long-term capacity building efforts, such as trainings and expert workshops, and operational support. Third sub-programme, conflict prevention and resolution support, includes assisting national actors in participatory policy-making that supports conflict prevention and resolution in fragile contexts.

In this study we are concentrating on the first sub-programme, mediation and dialogue. Since present-day conflicts and peace processes often involve multiple levels and actors, there is need for broad based negotiations and dialogue. As a private diplomacy actor, CMI is in a good position in broadening the mediation process to those conflict parties that cannot be formally engaged. To maximize the impact of the programme, CMI focuses on those individuals who have leverage in their respective societies and hence have access and credibility to take the messages forward.

The sphere framework (see Figure 1) developed by CMI illustrates this intervention logic and CMI's ability to influence different actors related to the peace process. The sphere of control represents those actors who are directly engaged in CMI's activities. It includes the CMI team who is working at the conflict site, their partners and those conflict parties and other stakeholders who are participating in the workshops and negotiations facilitated by CMI. CMI can directly influence these actors in the workshops and negotiations aiming to increase trust and engagement between participants and to create new ideas and solutions for ending the conflict. However, the objective of workshops is to influence the broader public than just the participants. Through the workshop participants the ideas developed in workshops can reach the sphere of influence which consists mainly of the close constituencies of the participants. However, CMI has no direct control if and how the participants communicate forward the ideas developed in the workshops and hence to the larger outcomes of workshops. The sphere of interest consists of those actors who are an integral part of the peace process but can be directly influenced neither by CMI nor the workshop participants.

Peace is the long term objective for CMI. However, the evaluation of a peace process is important in all of its phases since quick and easily measurable results rarely exist. Because CMI is an organization of civil society financed mostly by governments, transparent and accountable management of the activities and results is required. Evaluation of the results is also important for ensuring programme effectiveness and impact because it enables learning from the past experiences and development of the programme. It also supports for a better design of the future interventions. CMI wants to ensure the high quality in the programme and has in recent years made investments to improve its capacities to monitor, assess and manage results. The evaluation in conflict resolution and peace building is still methodologically young but CMI is committed to the innovative development of new tools and practices. (Anon., 2014)

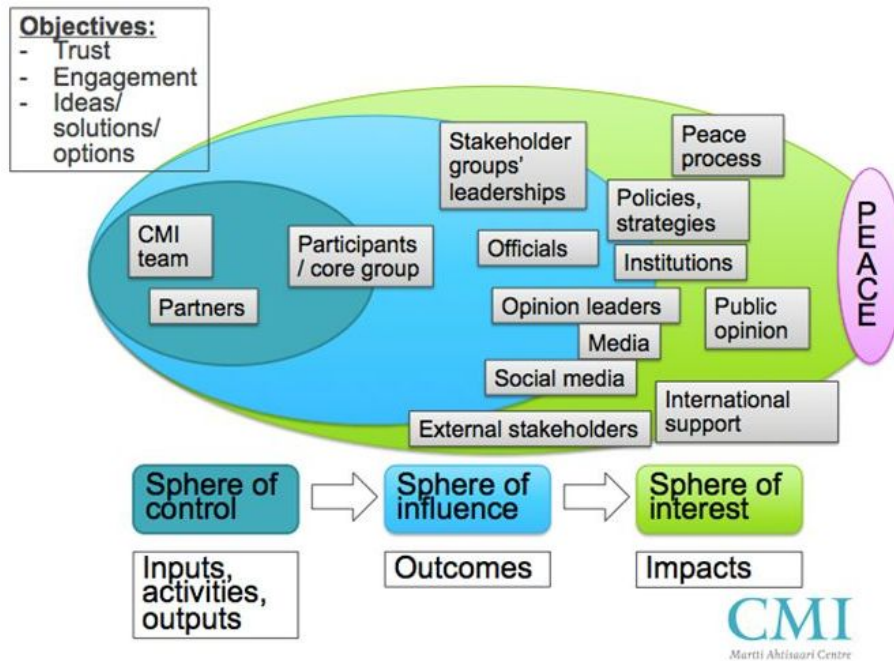


Figure 1: The sphere framework

3 Model structures and assumptions

In order to recognise the relevant measures of CMI impact and to design ways to measure them, we created a model to represent the CMI field of operations, its dynamics, and the most important characteristics. The essence of this model is the network approach we took on the conflict stakeholder groups. To characterize the different variables about the stakeholder group relationships, we created a system dynamical model of the CMI workshop environment and their outcomes. In this section brief theoretical reviews regarding both the network approach and system dynamical models are presented. We also discuss the data aggregation methods and the ways CMI could exploit the developed model and its implications.

3.1 Network approach

Modern conflicts often involve an intra-state context in addition to the inter-state one. In a complex conflict situation, the group of different conflict stakeholders can be diverse, and their inter-group relationship dynamics multidimensional. In this project we decided to take a network perspective on the conflict stakeholder groups and their interactions.

A graph $G(V, E)$ is a set of nodes V connected to each other via edges E . In the conflict stakeholder analysis context a node would represent a stakeholder group and an edge the connection between two stakeholder groups. A graph is sometimes called a network if edges are assigned different weights w_{ij} to describe for example distances or costs linking two nodes i and j together. A graph is undirected if and only if none of the edges has an orientation, i.e. edges (i, j) and (j, i) are identical $\forall i, j \in V$. Otherwise, if the edges are oriented such that along an edge (i, j) it is only possible to move from node i to node j and not all edges are identical, a graph is called directed. A mixed graph includes both directed and undirected edges. A complete graph is a graph in which all the nodes are connected to each other by an edge. We assume that a graph expressing the relationships between different conflict stakeholders is a complete graph by its nature. The conflict stakeholder graph could however be either a directed or an undirected graph depending on the dimension in which the relationship is determined.

Network approach offers a systematic way to present and analyse group (node) interactions. Common problems formulated using graphs include, for example, finding the shortest path or maximal flow inside a network. Humans can only process relatively small and simple networks efficiently. Thus, the larger the graph, the more important it is to be able systematically analyse a graph. Graph and network theory tools can be used to pinpoint interesting properties about the conflict stakeholder network.

3.2 System dynamics model

System dynamics (SD) modelling (see, e.g. Forrester (1994)) helps understand causal relationships in a complex system. In the model different system variables are represented by nodes and their causal relationships by directed edges. These edges are either labeled with a plus (+) or minus (-) sign to represent a positive or negative causal link. If a causal link is positive, an increase in the start node (variable) leads to an increase in the end node (variable). In the case of a negative causal link, an increase in start node leads to a decrease in end node. By mapping the most important system variables and their causal relationships the behaviour of a system can be formally studied.

It is especially important to recognise the reinforcing and balancing loops inside the system. A loop in the system is a path along edges that starts and ends at the same node. A reinforcing loop is a loop that contains an even number of edges labelled with a minus (-) sign. A balancing loop on the other hand contains an odd number of edges labelled with a minus sign. A reinforcing loop tends to drive the system into an extreme state. In a two node (i, j) reinforcing cycle example with no minus signs, an increase in i leads to an increase in j , which in turn leads to an increase in i , and so on. If the same loop had one minus sign an increase in i would lead to an increase in j but the increase in j would lead to a decrease in i , which again would lead to a decrease in j and increase in i . Thus a balancing loop drives the system towards its natural balance state.

In order to decide on the major variables that characterise the relationships

between conflict stakeholder groups we constructed a system dynamic model (cognitive map, see e.g. Eden (1994)) of the CMI peace mediation workshops and their immediate outcomes. The model structure was based on our perception of the mediation process guided by the literature provided by CMI and the early discussions with CMI staff. The resulting model is displayed in figure 2. Some nodes have been highlighted to improve readability and to better express our view on the process and its outcomes. Blue nodes represent CMI direct inputs to the process, yellow nodes represent outcomes of CMI workshops and assistance, and green node represents the short-term goal of the mediation process. Based on this analysis we decided to include trust, respect, technical communication capacity, and communication ability as the characterising variables of stakeholder group relationships.

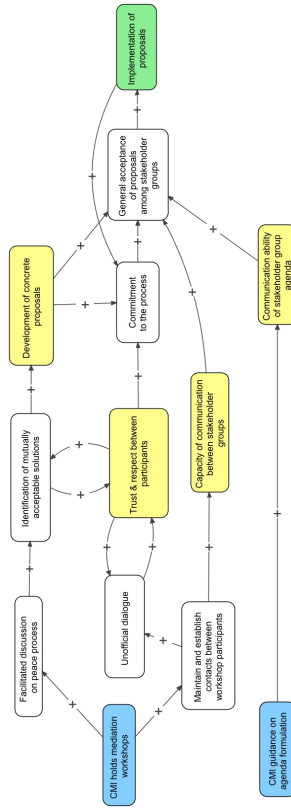


Figure 2: System dynamic model of CMI peace mediation process. Blue nodes represent CMI direct inputs to the process, yellow nodes represent outcomes of CMI workshops and assistance, and green node represents the short-term goal of the mediation process. An edge labeled with a plus (+) sign indicates that an increase at the start node leads to an increase at the end node.

3.3 Data aggregation

Traditionally relationships in network or graph theory are represented in one dimension (distance, costs, etc.). In our procedure there is a need to evaluate relationships between stakeholders in more than one dimension.

To apply graph theoretical tools the multidimensional data on relationships between groups must be aggregated into a single measure. Another possibility is to apply the tools into different dimensions, such as trust and communication capability, separately.

An aggregation formula is a mathematical model which always is an approximation of the reality. Thus it can lose information or give a biased view of the reality. However, ideally an aggregation rule accurately compresses information. This can be necessary as human ability to comprehend multidimensional data is limited. Below we present the aggregation formulas used in our prototype procedure.

3.3.1 Capability to engage in a constructive dialogue

We identified *trust* of A toward B (T), *respect* of A towards B (R), A's ability to communicate its agenda (A), *technical communication capacity* between A and B (C) as four determinants of capability of A to engage in a constructive dialogue with B (D).

Technical communication capacity and ability to communicate agenda are both logical necessities for a dialogue. We call them jointly *communication capacity* (CC). Trust and respect on the other hand are necessities for the peace negotiation dialogue to be constructive. Here we develop an aggregation formula $C = F(T, R, A, C)$.

We first decompose F to $F(T, R, A, C) = F(g(T, R), h(A, C))$. We assume that the effects of T and R to D are relatively independent from each other and thus g can be calculated as weighted sum of T and R $g(T, R) = w_1T + w_2R$. We do not consider the effect of A and C to be independent from each other as it seems realistic that the greater the technical communication capacity is, the greater the effect of ability to communicate ones agenda.

We assume $h(A, C)$ is a multilinear function in A and C . This means, for a fixed C , the function is linear in A and vice versa. The weighted sum is a special case of multilinear functions. However, multilinear functions can be used model more complex relationships and synergies. Multilinear functions are also used in the multi-attribute value theory as value functions (Keeney, 1976). We also assume that F is multilinear function in g and h .

We derive $h(A, C)$ by assuming that the unit increase C results in a fixed increase in h for a given A and that the unit increase in A results in a fixed increase in h for a given C . The greater A is, the greater the effect of C and vice versa.

In our prototype version we assumed

$$g(T, R) = \frac{T + R}{2}, \tag{1}$$

where the unit increase in either T or R have the same effect.

To derive h we drew a 5×5 coordinate table and started to iteratively figure out reasonable aggregate values for different combinations of C and A . The process converged to

$$h(A, C) = \frac{1}{5}(C(A - 1) + 1) + \frac{4}{5}. \quad (2)$$

With $A = 1$ this formula gives 1 which is the worst possible value, i.e. when ability to communicate is at its minimum, it does not matter how good the technical communication capacity is. When $C = 1$ the unit increase in A results in a unit increase in h . When $C = n$ the unit increase in A results in an increase of n units in h .

The logic behind aggregation of ability to communicate and technical communication capacity seemed reasonable for aggregation of trust and respect with communication capacity as well. We did not have enough time to carefully calibrate F and therefore we decided to use the same formula as above, i.e.

$$F(g, h) = \frac{1}{5}(h(g - 1) + 1) + \frac{4}{5}. \quad (3)$$

We remark that at the start of this project we did not think of data aggregation in detail. At that point, however, we already decided that trust, respect, ability to communicate agenda and technical communication capacity would be the four dimensions to be measured. Using these to develop a measure of 'capability of A to engage in a constructive dialogue with B' is thus done ad hoc. Ideally, if one wanted to measure 'capability of A to engage in a constructive dialogue with B' one would begin by defining what is meant by the the concept and what it consists of.

3.4 Uses of this model

The procedure was designed to serve as a tool in both project planning and monitoring phases. Project planning activities often consist of creating a holistic view on the conflict situation, crafting an intervention logic used in the project, scheduling of mediation activities, and allocation of resources to the activities. Project monitoring, on the other hand, focuses on measuring the ongoing project activities and their outcomes, identifying ways to guide the project efficiently through risks and issues emerging during the project, and giving feedback on the project performance. The ways our prototype procedure can contribute to the project planning and monitoring phases are described below.

Outside the frame of reference of project planning and monitoring, fine tuning the model by questioning its assumptions and structures, such as the system dynamical view of the mediation dialogue process and the key characteristics of stakeholder relationships, would encourage CMI to engage in broad internal discussion about the assumptions based on which they currently work. In this sense the procedure can be used as a platform to facilitate a company wide development process which aims to crystallise the common perception of how

conflict resolution activities affect the conflict stakeholders and what are the most crucial drivers of success. This approach became apparent once our procedure development came close to its end as the CMI staff realised that they were themselves unable to provide us with unanimous answers regarding the model structure. We together with the CMI staff concluded that further development of our procedure was not necessary until they had taken the time to thoroughly discuss their own assumptions regarding conflict resolution activities.

3.4.1 Use in project planning

The most powerful way to use our developed procedure is to facilitate the creation and communication of a common perception of the project field of operation, i.e. what the key stakeholders are what relationships are the most crucial for achieving the project goals. A visual representation of the conflict stakeholder network and the questionnaire answers give the experts a convenient way to express and share their views on the conflict situation. In case the size of the conflict stakeholder network increases to an extent that the full network seems hard to interpret on itself we introduced specific tools to pinpoint interesting facts about the network characteristics. These facts can then be used as inputs to the project planning process.

The number of participants CMI is able to have in its workshops is limited. An important decision in the project planning phase is thus which stakeholder groups to include in the workshops. Having a common perception on the conflict situation as a whole and a formal representation of the stakeholder relationships helps the CMI to make a solid decision.

In overall our procedure gives suggestions on how to effectively focus mediation resources by addressing which stakeholder connections are most critical in the context of the whole stakeholder network.

3.4.2 Use in monitoring of projects

Our model defines the most important outputs of the CMI mediation activities and how they collaborate to the implementation of concrete proposals aiming to establish a peaceful resolution of the conflict. This allows CMI to measure the outcomes of its workshops in a way that can be related to the overall process of conflict resolution. Currently CMI has the means to measure the immediate concrete outputs of the mediation workshops such as the number of proposals created and workshop participants. Our procedure takes one step away from the workshop and participant level to attempt to examine how the efforts of the workshops translate to the more broader and less controlled environment, i.e. the development of stakeholder group relationships.

Monitoring of relationships could be conducted by establishing a baseline study of the network characteristics before CMI activities take place and repeating the expert assessments in certain intervals to see if CMI presence has contributed to the development of stakeholder relationships. The interval between assessments needs to be long enough so that the lag between the workshop

participants relationship development and stakeholder groups relationship development are taken into account, the changes in the relationships are big enough to be noticed by our measurement tools, and making the assessments does not become too much a burden to the CMI experts. On the other hand the shorter the interval the more accurate data CMI can capture of the dynamic nature of the peace mediation process. We suggest that the time interval between expert assessments to be around 4-8 months depending on the conflict situation. The optimal length of the interval should however be determined through actual field tests of the procedure.

However, even though we were able to identify some ways in which CMI workshops contribute to the stakeholder group relationships the actual development of those relationships depends on many of other things besides the CMI workshops, such as actions of media or groups not attending the workshops. In many cases there are even multiple peace mediation organisations working together or separately on the same conflict. Thus any development in the relationships is difficult to accurately account to the actions of CMI. What is then perhaps a more valid application of the monitoring data is to use it in identifying emerging trends or risks relating to the stakeholder relationships. These insights could then be used to redesign workshop activities or intervention logic if needed.

4 Data collection

4.1 Data sources

Since there are no means directly to measure relationships between groups, the expert judgments are used in our procedure for the assessment of relationships in different dimensions. Experts have a broader perception of the overall situation than ordinary people. Therefore, fewer assessments are needed to get a wide enough view of the relationships when utilizing expert knowledge. These experts can be either impartial actors, for example members of another mediation organization, or conflict parties themselves.

However, it should be noticed that some special features are attached to the assessments depending on from whom they are collected. If employing experts who are part of the conflict, the assessments of their attitude towards the other party may be the most accurate. However, since they are in the middle of the conflict, observing the other party impartially might be difficult. That might distort the party's assessments of the other parties' attitudes toward them self and each other. Therefore, one should maybe employ experts from all of the groups evenly or use experts from each group only for assessing their own attitudes towards the others in order to avoid the distortion of the overall image representing the perception of some particular party only. Impartial experts are in a better position to make an equally balanced assessments of the relationships between different groups. Therefore, fewer experts may be needed for making assessments because a single expert can make the assessment of all groups at

the same time.

4.2 Defining the stakeholders

The first step in data collection is to define the stakeholder groups that are included in the analyses. They can be those stakeholder groups whose relationships are the most essential for the peace process or of a great variety of different actors related to the conflict in order to give an overall picture of the situations. In a broad analysis, apart from including various groups also different type of actors, such as media, might be included.

The determination of the groups included into the analysis depends on the purpose of the analysis. For example, when seeking to observe the outcomes of workshops, it might be most practical to include into analysis only those stakeholder groups who have been worked with. Broader analysis is needed if the objective is a construction of an overall picture of the situation which might be valuable for example when choosing the stakeholder groups who to work with and whose representatives to invite in the workshops.

4.3 Measurement dimensions

We chose to measure relationships between conflict stakeholder groups in four dimensions: trust, respect and communication capacity which can be subdivided to communication ability and technical and logistical communication capacity. These dimensions are of the essence when considering relationships between conflict parties in relation to beginning or maintaining negotiations and finding mutually acceptable solutions for ending the conflict.

4.3.1 Trust

In our prototype procedure, we are describing trust between conflict parties in a following way: Trust is a state in which one party believes in the sincerity of the other party and has no suspicions toward the other. In the presence of trust, one is willing to rely on other in important matters. In addition, one expects the relationship between the other to be good and can imagine a peaceful future with the other.

Trust has been identified as a vital element of conflict resolution and building trust between the stakeholders has often been proposed as one objective for resolving conflict. Trust between conflict stakeholders makes conflict resolutions easier and more effective since they are more likely to believe each other and look for productive ways for resolving conflict. The more there is mistrust between the conflict parties the more they focus on defending themselves against the other or attempting to win the conflict (Deutsch, Coleman and Marcus). Also CMI has stated building trust between conflict parties as one of their objectives in order to increase the possibility of the positive results of mediation (Anon., 2014).

4.3.2 Respect

In this procedure, we define respect as giving value for a person or a group and their rights, treating others with the dignity and recognition of the views and perceptions of others. In addition, it means acknowledging the others, listening to them, being truthful with them and accepting their individuality. Absence of respect can feed anger and hostility and at the worst lead to humiliation and violence.

Respect is a crucial for building better human relationships which is central part of a conflict transformation (Lederach, 2003). When respect is present, parties are more willing to do compromises which are long-term and sustainable. Therefore, it is more probable to attain durable influence in the presence of respect than by doing compromises under duress. Respect can also contribute to building trust between disputants since treating others with respect will increase the trust they place on the party (Lewicki and Tomlinson, 2003). Therefore, consolidating respect can lead to a positive change in the direction of conflict.

4.3.3 Communication capacity

Communication is the basis of negotiations and therefore a central part of peace mediation. In this document, the word ‘communication’ is used for an information transfer and communication capacity means the possibility for transmitting messages from one conflict party to another party. We subdivided communication capacity to two components; communication ability and technical and logistical communication capacity. By communication capacity we mean the competence of a conflict party to formulate its own opinions, objectives and agenda and ability to verbalize and communicate that information so that it is understood by the other party. By technical and logistical communication capacity we mean the technical devices and logistical possibilities that enable delivering messages and arrange face-to-face interaction between two groups.

Communication is essential for exchanging ideas and finding mutual understanding and solutions to ending the conflict. A capacity to understand and sustain dialogue is essential for a constructive negotiation. “Capacity building aims to improve the capacities and skills of the local actors in meaningful engagement.” It is noted as one of the objectives in CMI programme since having the capacity to engage in political negotiations and sufficient understanding about the issues negotiated and demands made are essential for a successful peace process (Anon., 2014).

Communication is not automatically resolving the conflict. Poor communication can lead to misunderstandings and therefore even harm the peace process. In addition, in the absence of real will to resolve the conflict communication may inflame tense between disputants. However, increasing mutual understanding is impossible without communication. As Morton Deutsch and Peter T. Coleman and Eric C. Marcus wrote in their book *The handbook of conflict resolution*: “Good communication cannot guarantee that conflict is ameliorated or resolved but poor communication greatly increases the likelihood that conflict contin-

ues or is made worse.” (Deutsch, Coleman and Marcus). Therefore, minimizing poorly functioning communication and maximizing mutual understanding is important for a peace process.

4.4 Questionnaires

In the prototype procedure, a questionnaire for each dimension was developed in order to assess the relationships of stakeholder groups from different perspectives. The experts give their assessments of trusts, respect and technical and logistical communication capacity between the stakeholder groups and communication ability of different groups. The definitions of the dimensions are given at the beginning of a respective questionnaire. The questionnaire as a whole is presented in appendix A. That trial version was created in Google Forms.

Only one question was used for assessing relationships an each dimension which all employ the scale of one to five. However, the assessment questions were slightly differently framed for different dimensions. In the trust questionnaire, five descriptions of trust are given and assessment of the magnitude of trust must be done by taking all of them into account. In the respect questionnaire, respect is considered in three dimensions which describe the features and occurrence of respect. Each of them has their own definitions for a measurement scale. The actual assessment of the respect should be done by considering group’s position in the measurement scales of these three dimensions. The questionnaire of communication capacity is divided into two sections; communication ability and technical and logistical communication capacity. In these sections, each component is described on more detail and by using these descriptions expert must place the groups to the scale of one to five according to their magnitude of communication ability and technical and logistical capacity for communication.

Between different measurement dimensions, there are also differences in the number of assessments needed to make. Trust and respect between two groups is not necessarily the same in both directions though there is most probably some relationship between them. Other party might for example respect the other party more than is respected by them. Therefore, we chose to measure them separately and assessments for both group A’s trust and respect towards group B and group B’s trust and respect towards group A have to be conducted. That is to say, trust and respect are directed. Communication capacity is a characteristic of the relationship of parties. Therefore, it is the same in both directions and only one assessment of the communication capacity between two groups is necessary. Communication ability is a personal feature of a group and hence assessed separately for each group.

4.5 Challenges of data collection

During the process of developing the prototype procedure for measuring the relationships of conflict stakeholder groups, we identified some challenges in data collection that should be taken into consideration if this procedure will be

developed further. In this section we describe some of the challenges and how they might affect to analysis.

4.5.1 Defining of the measurement dimensions and assessment questions

In order to create a clear, collective understanding on what is measured, the measurement dimension should be explicitly defined. The definitions for the measurement dimensions should take into account the conflict context. Terms such as "trust" can have different meaning in the context of conflict than in everyday .

The definitions of the measurement dimensions influence the selection and formulation of questions and measurement scales which is one of the integral parts of the analysis. They should be framed in such a way that they are relevant to assessing the desired dimensions. In formulating meaningful questions and measurement scales some special aspects related to conflict situation have to be taken into account. Since the stakeholders are in conflict with each other, notable trust and respect between them can hardly be expected. In addition, the highest possible level of trust or respect between disputants may differ greatly from what we in normal situation understand as a high level of trust or respect.

Definitions for both measurement dimensions and scales should be as precise as possible in order to minimize the possibility of different interpretations between experts and even more importantly to diminish the differences between individual interpretations in separate moments. This is important if an analysis is repeated and the same experts make the assessments again after a certain time interval in order to monitor the changes in the relationships of the stakeholder groups. If there is too much room for interpretations, the changes in the relationships discovered in analyses might be caused by a different interpretation of the measurement scales instead of real changes in relationships. Good understanding of the conflict context is required for specifying the relevant questions and definitions for measurement scales and therefore employment of expert judgments might be necessary.

4.5.2 Choosing of the data sources

In our procedure, we chose to use expert judgments whereby it is necessary to consider who are the best experts for assessing the relationships between conflict stakeholders. Information caught from different sources may differ because assessments might be unintentionally or even purposely distorted. It can be argued that the conflict stakeholders themselves have the best insight of the situation and the relationships with each other. They have the first-hand knowledge on how much they for example respect the other party and how much they feel respected by them. On the other hand, the conflict stakeholders are also those who have their own interest at stake most. In a conflict, there is often a lot to lose and therefore the conflict stakeholders might have interest to manipulate the measurement results for their own benefit. In that regard, outside

view might be more reliable.

4.5.3 Number of questions

Measurement of the dimensions included in our analyses is not straightforward. Especially, trust and respect are not easily measurable concepts. If experts are simply asked their opinion about trust or respect between conflict stakeholder groups, the assessments might be too subjective and much dependent of experts' individual experiences in order to capture reality accurately enough. Therefore, it could be useful to use several questions bringing out different aspects related to the dimension that is being measured. The most truthful picture of the situation would be received if judgment were based on both subjective views of the situation and objective, observable factors.

However, increasing the number of questions rapidly increases the number of the judgments that experts have to do, especially in dimensions which are directed. Since we are using expert judgments in this procedure, such limits as time have to be taken into consideration in order to make the procedure functional in practice. It is not meaningful to collect expert judgments if there is not sufficient time or the number of questions is too high for sustaining concentration until the end of questionnaire and therefore the assessments are not properly considered.

4.5.4 Context dependency

In our procedure, we created a prototype procedure for measuring the comprehensive trust, respect and communication capacity between conflict stakeholder groups. However, it is necessary to stop thinking in which degree such broad trust or respect exist or is reasonable to measure. Trust toward another conflict party for example can be highly dependent on the subject under consideration. Trusting other party in one matter does not necessarily mean that there is trust also in another affair. A conflict party might for example trust to another party when agreeing on arranging election but not believing other party to keep its words when negotiating about issues related to a security sector.

In addition, comprehensive measure is not necessarily needed. If the conflict parties are negotiating of a specific issue, we might want to measure the trust relative to that. That might provide more valuable information since it enables to find the complications related to that particular issue and plan the interventions accordingly.

5 Visualisation tools

In order to test the different visualisation tools we created a test network of 5 stakeholder groups by applying the developed procedure. In this section we describe the different visualisation tools developed and demonstrate their use with the test network. The programs we chose to use in this project were: Gephi

for visual graph representations and filtering, and for the clustering and shortest path algorithm implementations Excel VBA.

5.1 Graph representation

In a graph conflict stakeholder groups are represented by nodes labeled with letters and every node is connected to another by a two-dimensional edge. The width of an edge represents the communication capacity (CC) between stakeholder groups, the wider the edge the better the communication capacity. The colour of an edge represents the trust and respect measure ($g(T, R)$) between groups. The colour coding resembles the one used in traffic lights: green indicates good trust and respect, yellow mediocre trust and respect, and red complete lack of trust and respect between the stakeholder groups. The coding is continuous, so for example an orange edge indicates that trust and respect are between a mediocre and minimal level. A graph representation of the test network is displayed in figure 3. Nodes 1, 2, and 3 act as a legend displaying the best possible relationship possible (nodes 1 and 3) and the worst possible relationship (nodes 1 and 2) regarding both communication capacity, and trust and respect measures.

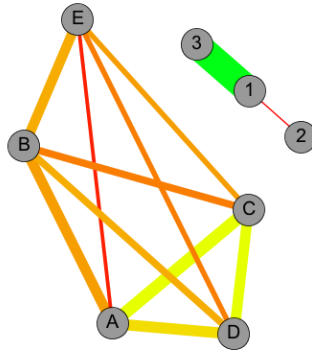


Figure 3: A graph representation of the 5 stakeholder group network we used to test visualisation tools. The five stakeholder groups A , B , C , D , and E are represented by the grey interconnected nodes. Nodes 1, 2, and 3 merely serve as a legend displaying the best and worst connections in respect to trust and respect (colour), and communication ability (width).

The questionnaire produces data for a network with directed edges. However in order to make the graph more readable we decided to draw the graph representation with undirected edges which halved the amount of edges visible in the graph. The undirected edges were constructed by taking the minimum scores for trust and respect ($g(T, R)$), and communication capacity (CC) from the directed edges connecting the two nodes. The minimum operator was chosen because the minimum of the pairwise scores could be seen as the limiting factor

of the relationship and thus would be a good indicator of the actual relationship performance. The difference in pairwise scores is naturally an important information but adding that information into the graph would bring more complexity than added value to the graph.

When drawing graphs the placement of the nodes on a two-dimensional plane must also be considered. The placement can be used to convey information just as the colour of the edges for example. If the nodes represent geographically integral stakeholder groups the placement of nodes could be done based on the geographical locations of the conflict stakeholder groups. On the other hand the placement could for example be made based on how close the groups are regarding some metric expressing the state of their relationship, such as the capability for engaging in constructive dialogue (CD). One must be careful when placing the nodes since the locations are easily interpreted with a closeness mindset, and careless placing may impose strong assumptions on for example the conflict sides or allies. The best way to place the nodes could thus be a way that is simple to understand, offers a natural explanation to the closeness of the nodes, and is communicated clearly to the viewers of the graph. In figure 3 we chose to place the nodes in such a way that the results of the clustering algorithm were easy to visualise using the original graph.

5.2 Centrality and extremity relationships

To understand the implications of the stakeholder group graph it is important to be able to distinct the most central groups, and the best or worst relationships in the network. As the size of the network increases this task becomes harder and harder to accomplish by humans without assistance. For example in the figure 3 even in a network of 5 stakeholder groups it is hard to tell which groups have on average the best or worst connections to other groups, especially as the graph displays the relationship characteristics in two dimensions.

To make the graph more simple to read and thus to make the task of recognising best and worst relationships easier certain filters can applied to the graph. Figure 4 displays the same graph as in figure 3 with an added high pass communication ability filter. The filter removes all edges from the graph that have their communication capacity (CC) level below a specified threshold level. Thus the groups with best connections to other groups become more easy to distinct. In this example one can for example see that the group A seems central in the network since it has three connections with high communication capacity levels.

In figure 5 a high pass trust and respect ($g(T, R)$) filter was applied to the test graph 3. The filter removed edges that had trust and respect levels below a specified threshold level from the graph. This filtered graph could be interpreted such that in general the most trusted and respected group would be group D .

In figure 6 a low pass trust and respect filter was applied to the test graph 3 which removed all edges that had a trust and respect level above a specified threshold level. In this graph the threshold level was set to a relatively stricter level than in the other filtered graphs 4 and 5 to expose the very worst relationships within the network in respect to the trust and respect dimensions. The

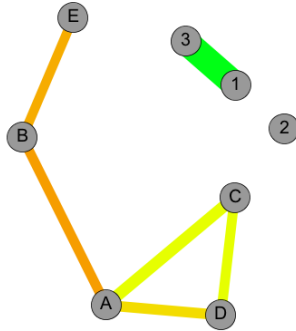


Figure 4: A test graph from figure 3 with a high pass communication ability filter applied. The graph shows the best connections of the graph with respect to the communications capacity dimension (width).

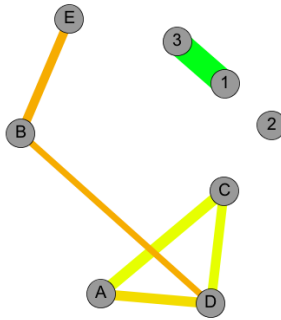


Figure 5: A test graph from figure 3 with a high pass trust and respect filter applied. The graph shows the best connections of the graph with respect to the trust and respect dimensions (colour).

worst relationship is in this case between groups A and E .

The threshold level of an individual filter can be manually set such that the readability of the graph is maximised. While setting the threshold level for figures 4 and 5 a natural and convenient threshold level was such that the graph barely remained a connected graph. This rule might not however apply to a larger sized graph that has at least a single node which has bad relationships to every other node, as applying this rule would not lead to removal of enough many edges to significantly improve the graph readability. In this case we recommend to let the node with only bad relationships become unconnected and use for example the clustering tool to find out the closest connection to the node.

The network theory literature offers a variety of different centrality measures to assess the importance of a node inside a network, see for example (Borgatti and Everett, 2011). We consider these numeric measures to be an interesting

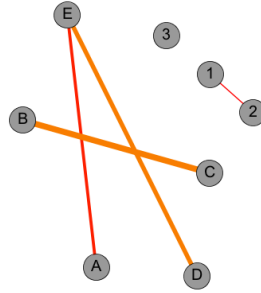


Figure 6: A test graph from figure 3 with a low pass trust and respect filter applied. The graph shows the worst connections of the graph with respect to the trust and respect dimensions (colour).

topic but for relatively small sized networks would recommend CMI to use the more visual techniques since they better contribute to the development of a holistic view over the conflict stakeholder network.

5.3 Clustering

Clustering is a procedure in which the goal is to create optimally homogeneous groups according to some distance metric. One popular way to perform clustering is by the means of a hierarchical clustering algorithm. The hierarchical clustering algorithm begins by assuming each node as a separate cluster and then one pair at a time starts to agglomerate the closest clusters together using some specified distance metric. The algorithm stops when only one cluster containing all the original clusters is left. The agglomeration operations at each step of the algorithm can then be expressed as a tree-like construction called a dendrogram. (Olson, 1995)

In this project we decided to use a hierarchical clustering algorithm with a single link graph metric. Single link metric interprets the distance between two clusters to be equal to the minimum distance between any two nodes inside those clusters. This metric produces clusters inside which nodes have close connections to their neighbour nodes but a cluster may include extremity nodes that are significantly distant to each other as the cluster shapes are prone to become long and thin rather than circle like. In our opinion the single link metric suits the conflict context since for example political parties may include radicalist wings whose opinions or actions are not close to those of the average party members, but who have close connections to some non-extreme individuals inside the party.

In order to apply basic clustering and shortest path algorithms to the conflict stakeholder graph we needed to come up with a single distance metric describing the distance between stakeholder groups based on the capability to engage in a constructive dialogue (*CD*) measure (defined in section 3.3.1). With the

shortest path algorithm and its implications in mind we decided to search for a transformation $d(CD)$ that would fulfil the following set of rules:

- i. $d(CD)$ continuous
 - ii. $d(CD) > 0 \quad ; \forall CD \in [1, 5]$
 - iii. $\frac{\partial d(CD)}{\partial CD} < 0 \quad ; \forall CD \in [1, 5]$
 - iv. $n \times d(x) \leq d(y) \Leftrightarrow (x - y) \geq (n - 1) \quad ; \forall n \geq 2, x, y \in [1, 5]$
- (4)

The rules *i.-iii.* simply state that the function $d(CD)$ should be continuous, positive, and monotonically strictly decreasing. The idea of the rule *iv.* is such that when calculating for the shortest paths inside the graph, the shortest path algorithm should consider the non-direct path with n edges from node i to j to be shorter than the direct path (i.e. the edge (i, j) with CD value y) in case all the edges in the non-direct path have at least a CD value x greater or equal to $y + (n - 1)$.

After some testing of several different function types we settled down with a simple power function (5) that filled requirements *i.-iii.* and approximately filled the requirements set by the rule *iv.*.

$$d(CD) = CD^{-\alpha} = CD^{-2.5} \tag{5}$$

The exact behaviour of the distance function d can be controlled using the parameter α .

Clustering algorithm was applied to the test graph of 5 stakeholder groups. The steps taken by the algorithm are displayed in figure 7 using a dendrogram. From the dendrogram we could see that the agglomerated clusters in the first step were clusters A and C , in step two clusters AC and D , in step three clusters B and E , and finally in step four clusters ACD and BE were agglomerated and the algorithm stopped.

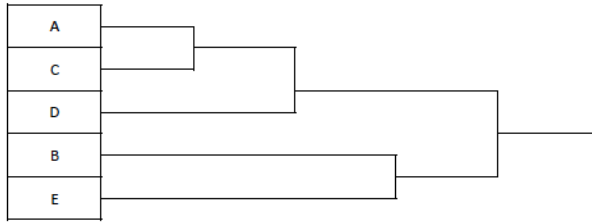


Figure 7: A dendrogram displaying the steps taken by the hierarchical clustering algorithm when applied to the test graph.

The results of the clustering algorithm can also be displayed on a graph by for example circling the clusters agglomerated by the algorithm. In figure 8 the results of the clustering algorithm when applied to the test graph are displayed on the filtered graph 4. Especially in case the size of the graph is big we recommend to use the dendrogram instead of the graph when visualising the

results of the clustering algorithm. Small sized filtered graphs remain readable even if the results of the clustering are displayed on the graph.

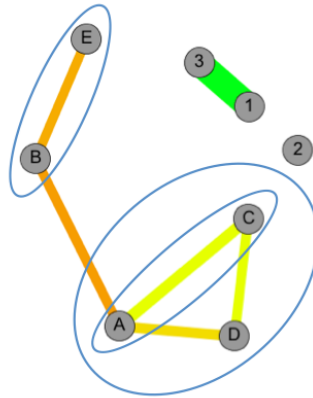


Figure 8: Results of the hierarchical clustering algorithm displayed on the filtered test graph 4.

5.4 Shortest direct paths connecting clusters

Shortest direct paths between clusters could be interpreted as the most prominent connections between two clusters. Finding out these connections may prove to be helpful when two clusters should start communicating with each other for example in order to implement a proposal developed in the CMI workshop. The groups between which the shortest direct path connecting the clusters lies could be in a natural position to become the leaders coordinating the inter-cluster efforts leading to the proposal implementation. This conclusion is however in our opinion strongly subject to any context dependencies affecting the inter-group relationships and should not be made without a closer expert assessment.

In small sized graphs these shortest direct links a straightforward to search even by hand from the raw data represented in a matrix form or from a filtered graph displaying the clustering results, such as the figure 8. For bigger graphs a special algorithm could be implemented.

5.5 Shortest paths connecting nodes

The shortest path from one node to another can be easily calculated with a dynamic programming -algorithm. The algorithm is based on Bellman's principle of optimality. The principle states that if an optimal path passes through a node, the path from this particular node to the destination must also be optimal. Using this characteristic, we can justify dividing the original shortest path problem into recursive sub-problems that are eventually easy to solve.


```

function SHORTEST PATH(Start, End)
  if Start == End then
    return 0
  else
    return minMiddle { $d_{\text{Start, Middle}} + \text{SHORTEST PATH}(\text{Middle, End})$ }
  end if
end function

```

6 Case Study: Palestine

To test the usability and relevance of our procedure, a trial run was arranged. We decided together with CMI, that the situation in Palestine would be a good example on which to test our framework. Through CMI's contacts we were able to get real data from experts amidst the chaotic situation in the Palestine area. The experts used in this trial were working with CMI and are not personally involved in the crisis.

As usual, the first step was to identify the different stakeholders which were to be taken into account in the analysis. It was decided that with the amount of data and time available, three groups would be sufficient for our purposes. These three groups were identified and are denoted in this text as groups *A*, *B* and *C*.

The experts were given our questionnaire and we received responses from a total of four different experts. With the aggregated results from the questionnaire data, we were able to visualize the groups' relationships. In figure 9 we can see the three identified groups and their relationships to one another. The lines between groups 1, 2 and 3 serve as a legend. The relationship between 1 and 2 is the worst possible, while 1's and 3's is the best possible.

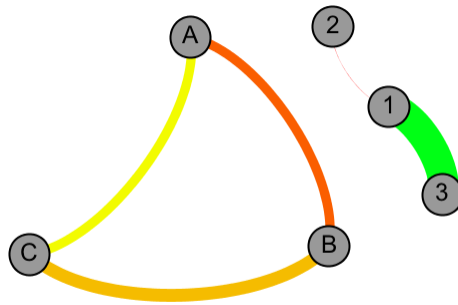


Figure 9: The relationships between different stakeholder groups in Palestine

It can be seen from the figure, how the worst relationship is between groups *A* and *B*. Likewise, one can see how the best relationship is between groups *A*

and *C*. Furthermore, the biggest differences in the relationships of the different groups' are in the trust and respect between the groups. There are not very large fluctuations in the technical capacity of communication between the different groups.

Using the tools developed earlier, we can further analyse the groups' relationships. For instance, with clustering we can recognize coalitions from within the system. In this case the clustering algorithm would recognize groups *A* and *C* as a coalition. This result is in agreement with the intuition of our experts.

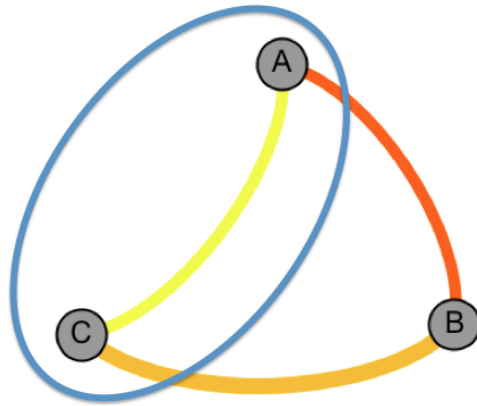


Figure 10: The result of the clustering algorithm

We can also utilize the shortest path -method to these groups. Unfortunately we did not have a chance to elicitate the proper parameters for the shortest path -algorithm, but with our default parameters the algorithm suggested that the shortest path from group *A* to *B* would pass through group *C*. This could be interpreted so that if *A* would like to communicate with *B*, it would be useful to use *C* as a facilitator or middle-man in the conversations.

Our procedure gave results which are in agreement with the general overview of the experts. However, in some of the questionnaire questions there was significant dispersion among different experts' answers. It is possible, that the experts actually disagree on some points but it should also be considered that they somehow understood the questions differently. If this is the case, more attention should be spent on the questionnaire and the possibility of misunderstandings should be eliminated.

7 Further developments

Further development of this procedure should be done by CMI or in close cooperation with CMI. First it should be more concretely specified where this procedure would be used and for what purpose. Then the model should be

rebuilt with attention to the details relevant for that purpose. The most important details are the dimensions in which the stakeholders and their relations are evaluated. Also the logic behind the choice of those dimensions should be made clear. For example, how and why those dimensions play a major role in the conflict situation. Also the way of collecting the evaluations must be carefully considered, especially if the procedure is used for monitoring purposes. Further discussion on this is presented below.

7.1 Planning and consensus building

One alternative is to further develop and refine the framework as a planning and consensus building tool. Generating consensus overview per se helps in planning CMI's activities, because it enhances the communication between the different people involved in the planning process. After agreeing on what the situation currently is it is easier to develop plans on how to improve the situation at the conflict site. The way in which the information collected in the procedure is used to generate concrete actions proposals is highly contingent of the situation. A relevant question to be asked at that point is: What can we do to most effectively improve the current situation? Then interventions with clear intervention logic can be designed. Developing a clear intervention logic is part of the concept of "realistic evaluation" which is seen potentially very useful by some researchers in the field of developmental research (Holma and Kontinen, 2011).

If the tool is develop to this direction, the further development should carefully reconsider the dimensions in which the conflict stakeholders and their relations are evaluated. The most important factors influencing the conflict situation should be included. Also special attention must be given to those dimensions which CMI believes it can influence.

The most appropriate visualization technique must also be considered. If multiple dimensions are included and the logic in which they influence the conflict situation is complicated, the graph representation may be insufficient. It is difficult to visualize many dimensions in a single graph. On the other hand, multiple graphs can sometimes be presented. Alternative approach to a graph is to show the relations of two groups at a time. The relations of this groups can be visualised e.g. with a simple bar plot. The height of a bar would tell the state of the relation in one of the dimensions. Pairwise analysis can also be used side by side with a graph presentation. In the initial phase of including a new procedure into CMI's practise, it would be useful to experiment with different ways of using the procedure.

In case the procedure is used for consensus building, it could be useful to develop it to be a iterative process. For example, on each step of the iterative process the experts of CMI would be asked to give some information and to give rationales for their answers. After each step, the information would be analyzed and visualizations would be created that highlight the topics where the experts disagree. These could be discussed and then re-evaluations would be made by each participant separately until the group converges. The number of iterations is limited by the available time, thus at some point the group should agree on

the joint evaluation to be used as the basis for planning the mediation activities.

7.2 Monitoring

If this procedure is used in monitoring, the need for reliable measurements and data is emphasized. The measured dimensions and used scales should be unambiguously defined. We propose that monitoring changes in the conflict situation is done either by measuring the situation on certain time intervals or by directly measuring the change. Change can be measured by asking the experts about how the situation has changed, e.g. in the past year. If change is measured directly, and the information is elicited from CMI related experts we are concerned about the information being biased. A CMI related expert could e.g. think that “since CMI has done so much, there must be a change”. If the change is directly measured it could be good to use people not participating in peace mediation as sources of information. For example, the conflict participants could be directly asked about their attitude towards the other conflict parties. If CMI related experts are used, we believe “before and after” measurements to be less biased if the respondents do not remember their previous answers.

7.3 Context dependency

In practise CMI may wish to develop peace mediation activities that are specific to a certain context. In this case inclusion of context dependency to the procedure would be natural. This would mean that the e.g. the trust of A towards B is assessed in a certain context such as the reform of a national education system in country X. For example, A could trust B to be sincere when it comes to developing the education system, however A would not necessarily trust B when it comes to peace negotiations.

8 Conclusions

The prototype procedure, and related tools, developed and discussed in this work provide groundwork for CMI to build on. In the scope of this work, it is impossible to go into too much detail on specific issues. In addition, it is difficult for us to evaluate what really works and helps in practise of peace mediation. However, we believe CMI experts can learn something from this work or, at least, be inspired by it. It is even possible to build the tool exactly as we proposed. Even in that case the procedure should be rebuilt by CMI. The first task is to build a conceptual model such as the system dynamic model (figure 2) to create an understanding of what is relevant in the conflict situation. With the help of this conceptual model, the most interesting dimensions can be included in the procedure. Building the conceptual model and the measurement procedure is useful on itself. During the process, a common understanding on the logic of the conflict is created and common terminology is decided on. Also, it can be useful to give definitions for abstract things such as ”trust”. Finally,

as the procedure is used, the experts can agree on what the current situation at the conflict site is. Understanding the current situation is the cornerstone for developing plans on improving it.

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A Questionnaire for measuring relationships of groups

Measuring relationships of groups

Name

Measuring trust

The following conditions describe the trust of X towards Y

- X believes Y is sincere
- X lacks suspicion towards Y
- X is willing to rely on Y on important matters
- X expects the relationship between X and Y to be good
- X can imagine a peaceful future with Y

Collectively these five conditions define trust in this questionnaire. The degree of trust depends on how many of these conditions are met and to what extent. Please rate the following pairs of groups to a one to five scale.

The definitions for endpoints of the scale are given as follows:

One: X does not trust Y at all. None of the five conditions are met to any degree.

Five: X strongly trusts Y. All of the conditions are met to a high degree.

	1	2	3	4	5
A -> B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A -> C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B -> A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B -> C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C -> A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C -> B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Figure 11: Questionnaire for measuring trust

Measuring relationships of groups

Measuring respect

Respect means giving value for a person or a group and their rights. It means treating others with dignity and recognition of the views and perceptions of others. It also includes acknowledging them, listening to them, being truthful with them and accepting their individuality. Absence of respect can feed anger and hostility and at worst lead to humiliation and violence. Respect can be both give and/or received.

	1	2	3	4	5
	Group A has no respect towards group B:		Group A has moderate respect towards group B:		Group A has complete respect towards B:
RESPECT	Desire to co-operate:	Group A has cut linkages with group B and is not willing to reconstitute them.	Group A is ready to negotiate with group B but not truly willing to reconciliation of dissenting opinions.		Group A is willing negotiate with group B and find mutually acceptable solutions.
	Occurrence of hostility and violence between group A and B:	Daily	Weekly	Few times a month	Few times a year None during the last 12 months
	Aggression used by group A in speech towards group B:	Speech towards group B is nothing but hostile, offensive or intimidating.		Hostile, offensive or intimidating appear occasionally in speech towards group B.	

Place each pair of groups, where A→B indicates A's respect towards B, to scale of 1-5 according to their respect towards other group considering the criteria in the table.

- 1: Group A has no respect towards B.
- 2
- 3: Group A has moderate respect towards B.
- 4
- 5: Group A has complete respect towards B.

	1	2	3	4	5
A → B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A → C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B → A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B → C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C → A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C → B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Figure 12: Questionnaire for measuring respect

Measuring relationships of groups

Communication capacity

Communication capacity denotes the possibility that conflict parties have for mutual communication. It can be divided to technical and logistical capacity and communication ability.

Communication ability

Communication ability is affected by the following factors:

- Competence to formulate own opinions, objectives and agenda
- Ability to verbalize and communicate that information so that it is understood by the other party

Place each group to the scale of 1-5 according to their communication ability.

1. Not able to formulate own agenda.
- 2.
3. Agenda is formulated and communicated somehow but it doesn't give clear understanding of the intentions of the group.
- 4.
5. Agenda is communicated clearly and understood by the other party.

	1	2	3	4	5
A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 13: Questionnaire for measuring communication ability

Technical and logistical capacity

Technical and logistical communication capacity means the technical devices and logistical possibilities that enable to deliver messages and arrange face-to-face conversations between two groups.

Place each pair of groups to the scale of 1-5 according to their technical and logistical capacity by taking the following aspects into consideration.

- How easily messages can be delivered between groups?
 - o Is there technical capacity for that?
 - o Is sending messages between groups somehow restricted/watched by a higher authority?
 - o Can messages be delivered straight to the group/person intended or is middle hands needed (e.g. media)?
- Are there obstacles for face-to-face communication? For example:
 - o Groups are located to different areas.
 - o There are limitations for movements or fear of violence which limits the possibility to arrange face-to-face meeting.

1. There is no capacity for communication or its usage is highly restricted.
- 2.
3. Communication capacity is insufficient or communication is restricted to some extent.
- 4.
5. There is sufficient capacity for communication and there are no restrictions for its usage.

	1	2	3	4	5
A <-> B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A <-> C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B <-> C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Figure 14: Questionnaire for measuring technical and logistical communication capacity

B Self assessment

The initial assignment was very broad. One goal of the project was to provide a systems analytic perspective to peace mediation. The context of peace mediation was unfamiliar to us at the start of this project. Therefore a large part (approximately one third) of this project work was to define a research question to be studied. We begun by reading the material on peace mediation provided us by CMI. After this we created cognitive maps (graphs with concepts and arrows between them) to help us understand the overall picture of peace mediation activities by CMI. During this process we realized that trust between conflict parties is very essential for the peace process at large. This led us to investigate the possibility to either model how trust is created and how it spreads or to investigate how it can be measured. In one of our meetings with CMI we realized that as trust is very abstract and concept dependent concept, a human is needed to interpret the conflict situation and the trust involved in it. From this we got the idea to measure trust and then visualise it as "networks of trust". Later we decided to add in other dimensions as well. After the research question / model to be built was decided on, we were adviced not to focus too closely into details. We decided to go into "depth first" search and form a "prototype procedure" which could then serve as a source of inspiration for future work by CMI. We could have spent whole spring trying to define "trust" perfectly.

We did not monitor the workload and it is very difficult to assess afterwards. Much of the work done during this project did not result in immediate tangible result.

We are happy with the outcome. We succeeded in getting a good grasp of what conflict mediation is and managed to build a procedure that could possibly help in understanding a conflict situation. During the project we spent much time brainstorming ideas on how this process could be developed and how it relates to other things done by CMI. Much of this discussion is not included in this report. CMI people seemed happy with the outcome of this project.