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Developing a Decision-making Model for Security Sector Development in Uncertain Situations

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Abstract

This paper recognises the many difficulties facing SSR practitioners operating on the ground in terms of their capacity to make strategic decisions which inform wider SSR planning. It evaluates many models and methodologies based on key criteria which – according to the SSR literature – significantly impacts on decisions taken regarding SSR programmes. The authors recognise that the most effective decision-making in uncertain environments is often supported by strong leadership, intuition and expeditious – but measured – approaches. Whilst this paper does not advocate for a more academic approach to be taken to SSR decision-making it illustrates the conceptual and academic thinking supporting the framework of the adapted and more simplified model chosen. The practical value of the decision-making model is

discussed in the final section of the paper which overviews a notional model using defence reform and police as two relatively straightforward SSR programme areas. Whilst this paper forms the basis of the model's development, the real value of the model can be realised in the initial strategic planning phases of an SSR programme. In addition, the model can be used in a number of further simplified and 'short cut' forms which offer practitioners a simple methodology for establishing initial SSR-related decisions. In parallel to this initial publication of the model – and in addition to the national SSR programmes used to trial the initial ideas - the authors will be producing a series of case studies which illustrate more simple and practical approaches to using the model in a number of national and thematic examples.

Introduction

Security Sector Reform (SSR) programmes usually involve numerous stakeholders, interests, agendas, and choices across a wide range of possible programmatic entry points. Two of the most difficult challenges in SSR programmes include: building consensus across a wide range of external and internal stakeholders; and making informed decisions regarding the selection and sequencing of SSR-related activities, a particular challenge in this domain given the breadth and depth of possible SSR programmes.

This paper evaluates decision-making aids of use to SSR practitioners in highly uncertain situations – a key characteristic of SSR programmes. It begins by summarizing some of the main challenges to initial decision-making at the strategic level during SSR engagements. It then evaluates the utility of a number of decision-making models and methodologies from the management literature. The paper then presents a simplified and adapted version of the multi-factor matrix for SSR-related decision-making. The adapted matrix was informed by interviews with members of the wider security sector and tested with a focus group of practitioners responsible for strategic planning for national security and SSR in one particular national context. The work forms part of a broader three-year research programme led by Cranfield University's Centre for Security Sector Management (CSSM) entitled *Exploring the Role of Management in Security Development.* Finally, the article highlights the ways in which the resulting model benefits from lessons learned as well as the ways in which its outputs could help resolve sequencing dilemmas.

The complex nature of SSR decision-making

Decision-making is the process of making choices among competing actions given incoming information. A good decision is one that increases the chances of a good outcome. During SSR, decision makers are faced with a multitude of challenges such as risk calculation[1], resource allocation, strategy formulation, outsourcing, facilitating change and programme planning. The first section of this paper reviews the literature and uses interviews with practitioners to determine how decision-making models might inform SSR.

Knowledge and Learning Management

Knowledge and learning can improve decision-making. SSR practitioners are often well-educated, trained and experienced, but not necessarily specifically in 'SSR'. Increasingly, these practitioners are able to access more organized relevant information. Indeed, United Kingdom Government has funded the development of the Global Facilitation Network for Security Sector Reform (GFN-SSR) over the past seven years. This service was established to create and develop SSR communities of practice and to provide an information portal which these communities could access in order to draw on the latest thinking in SSR concepts and practice.[2] Similarly, the United Nations (UN) has established a website housing all information relating to the area of 'Disarmament, Demobilisation and Reintegration (DDR)' of former combatants – an activity which often forms a significant part of post-conflict SSR programmes and which the UN Development Programme (UNDP) maintains as one of its core competencies.[3] These information portals sometimes organise this information into useful handbooks, guidelines and aide memoirs.[4]

Whilst this more practically focused consolidation of information goes some way to ensure that lessons are identified and widely disseminated, it is recognised that the institutionalization of lessons learned is extremely difficult, particularly given career mobility and 'paperless

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[1] See comments on importance of risk calculation and risk management in support of SSR activities in Nicole Ball and Luc van de Goor *Promoting Conflict Prevention through Security Sector Reform, commissioned by PriceWaterhouseCoopers on behalf of the Global Conflict Prevention Pool,* May 2008.

[2] See the GFN-SSR's website at www.ssrnetwork.net

[3] See the UN DDR website at www.unddr.org

[4] For example, see the Technical Assessment Mission Guidelines for DDR on the unddr.org website and the OECD-DAC Implementation Framework for SSR on the GFN-SSR website.

offices'[5]. Arguably, much of the learning takes place on operations and transfers between dedicated practitioners

The research uncovered over sixty journal articles and reports[6] whose titles allude to 'Lessons from…' a range of different geographical or thematic experiences. Of the sample of 20 'lessons' papers investigated, the vast majority criticized the feedback mechanisms, learning methodologies and learning environments available to practitioners. Interestingly, amidst efforts to develop its SSR capacity and thinking, the UN remains committed to prioritising lesson learning.[7] Thorsten Benner and Phillip Rotberg note that while comprehensive studies on UN Peacebuilding assert that 'learning' has not been one of the UN strengths, research so far has largely ignored the UN's infrastructure for learning. Benner and Rotberg's recent publication calls for any additional limited UN resources to be channelled towards strengthening the UN's learning capacity.[8]

Lack of consensus on SSR 'entry points'

Immediately following the disbursement of donor funding earmarked for SSR programmes, it is often the case that many potential entry points for SSR activities become apparent. In the past, 'defence reform' has been an obvious post-conflict SSR priority due to the role played by the armed forces during a conflict and also their incapacity prior to the conflict, which is symptomatic of development and governance-related conflict vulnerabilities.   Moreover, in countries such as Sierra Leone, Mozambique and Namibia, which underwent post-conflict security reforms in parallel with significant DDR programmes, it was necessary to link DDR objectives and outcomes to specific defence reform streams of activity. Defence reforms become further prioritized when a phase of stabilization operations immediately precedes a peace agreement or cessation of violence when the military is often the only local actor capable of initiating SSR programmes.

However, in many cases, the most obvious entry points are not always the best. Potential progress in one area must be evaluated in terms of both the positive and negative impacts across other areas. In some situations, the most effective entry activities may be very small steps

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[5] See Paul Molinaro, Derrick Neal and Ann Fitz-Gerald "Humanitarian Aid and Organisational Management", in *Conflict, Security and Development,* Volume 1, Issue 3, 2001.

[6] These documents were accessed between January 2008 – June 2008.

[7] UN Security Council, 5632nd Meeting (AM & PM), 20 February 2007, Department of Public Information, News and Media Division, New York. (**http://www.un.org/News/Press/docs/2007/sc8958.doc.htm**)

[8] Thorsten Benner and Phillip Rotman, "UN Peacebuilding and the Challenges of building a Learning Organisation" in *Journal of Intervention and Statebuilding*, Volume 2, Issue 1, March 2008, pp.43-62.

which require significantly fewer resources than any large-scale institutional SSR programme. One example might be in commissioning a small civil society organization to carry out a public opinion poll on certain issues related to the security sector. Another form of this initial activity may be developing a community of security practitioners/experts. Both activities could be used to achieve a range of initial objectives including securing local buy-in for SSR, developing a minimum level of security literacy and establishing a number of new emerging political voices.

There are several reasons why deeper thought is not applied to the choice of possible SSR entry points. Firstly, no one donor is singularly responsible for all SSR activities. Thus, most organizations pursue programmes based on core competencies and mandates, leading to an incomplete approach.[9] Secondly, there is no international mechanism for the coordinated management of SSR programme activities, which results in both independent lines of SSR-related activities and limited incentive for organizations with partial SSR mandates to restructure or refocus based on international requirements. Lastly, regular strategic review of in-country SSR programmes is rare. Strategic review could usefully inform ongoing strategic planning and respond to situational changes.

Lack of Strategic Thinking

Another criticism discovered in the literature – particularly with regards to reports, evaluations and analyses from specific in-country SSR programmes – is a lack of strategic thinking in support of SSR.[10] By nature, international organizations and bilateral donors have tended in the past to draw their policy-based and in-country human resources from a wide range of social science backgrounds including political science, international relations, conflict studies, international development and international security studies, just to name a few. These disciplines do not always provide skills in the strategic management of programmes. While military representatives can often bring a strategic approach which considers key issues, inter-dependencies, 'endstates', and mandates, there is often a lack of knowledge within this group of more traditional development skills such as governance, public sector reform and institutional development.

The life-cycle of an SSR programme reflects a number of linked or 'sequenced' lines of programme activity. In the past, it appears that strategic thinking has not been applied to the ordering of these inter-

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[9]Edward Boanas, "Crossing the fault line: Coordinating multilateral security sector reform engagements in post-conflict countries in *Journal of Security Sector Management,* Volume 3, Issue 3, July 2005.

[10] For example, see Nicola Dahrendorf, "MONUC and the Relevance of Coherent Mandates: The Case of the DRC" in Heiner Hänggi and Vincenza Scherrer *SSR in UN Integrated Missions: Experience from Burundi, DRC, Haiti and Kosovo,* LIT/DCAF, 2008, p.91.

dependent programmes in a way which best supports the most sustainable results. As such, any decision support methodologies for SSR must facilitate the evaluation of 'packages' of options.

Where there is a peace agreement and a multinational presence on the ground (perhaps by way of a UN mission) a 'loose' form of strategic framework is provided. However, since peace agreements serve as a tool which brokers a ceasefire or an end to hostilities – and are framed by words and tones which must be politically acceptable to all stakeholders - the extent to which peace agreements provide strategic guidance for SSR is limited to perhaps sketching out a sense of priorities only. During a time when the UN is currently developing its SSR policy and strategic thinking on SSR, linkages between SSR programmes and UN-endorsed peace agreements will become more important in the future.

Managing Spoilers

The final ongoing theme taken from the literature on SSR is how decisions can be made in a way which addresses the potential role and impact of spoilers to the process. These spoilers can range from more senior members of a current or former security regime, paramilitary or rebel groups, opposition leaders and a range of others. SSR policymakers and practitioners accept that they must make 'trade-offs' in order that an optimum level of progress to an SSR programme can be made. For example, one could argue that political processes had to be prioritized over transitional justice following the 1995 Dayton Peace Agreement in Bosnia. This was the case because some of the individuals who were to be held to account for their crimes against humanity during the conflict could have negatively impacted on the development of new security and political institutions.[11] Similarly, one could argue that police and judicial reform may be traded-off due to the greater availability of police reform practitioners and the high opportunity costs of 'doing nothing' when one security sector institution is prepared for and willing to change.

Spoilers can be present also within legitimate political processes. Such blockages can be a result of personality differences, personal agenda or resistance to change. In many cases, SSR practitioners work with and around these blockages by managing personal relationships. Spoilers can also emerge within groups of non-state actors (such as rebel groups) which normally operate outside the bounds of legitimate political processes. For this reason, a decision-making model supporting SSR

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[11] However, one could also argue that is important to have a timeframe for such a priority. Subordinating the needs of justice/RoL to the immediate political requirement can only be justified for a short period of time. If the situation is allowed to continue for too long, then the obvious lack of adherence to RoL would eventually contaminate the entire political situation and would make it. Much more difficult to reform the justice sector.

engagements must be able to consider the views of potential spoilers which operate at both the state and non-state levels.

In light of the issues identified above, which significantly impact on SSR decision-making processes, the following criteria will be used to evaluate the potential utility of a range of decision-making models for SSR:

- Provides strategic perspective
- Allows analysis of option 'bundles'
- Is user-friendly
- Can incorporate lessons learned
- Applicable to complex problems
- Assists timing/sequencing decisions
- Appropriate for multi-stakeholders
- Supports creative and innovative thinking

Decision-making and Decision-making Models

There are numerous decision-making models that can be used for selecting and prioritising strategies. These come from diverse disciplines such as marketing, operational research, management and social science. These models may be classified in various ways, such as those which are qualitative or quantitative, primarily objective or subjective (although it appears that objective models are used rarely without some judgment attached), complex or simple, hard (based on fact) or soft (based on opinions). Pidd[12] indicates that there is a spectrum of systems modelling approaches from those that are for routine decision-making at one extreme to those for thinking, that represent insight for debate and exist to support human action.

The Context of Decision Making

There are many factors that will influence the choice of model(s) such as the personal characteristics of the decision maker(s), the context and the type of issue to be resolved. Decision-making under any circumstances can be rational or emotional, logical or intuitive and may be based on fact or assumptions both explicit and implied. Based on the

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[12] M Pidd. *Complementarities in Systems Modelling from Systems Modelling Theory and Practice.* John Wiley & Sons: West Sussex, 2004.

environmental challenges summarized in earlier sections – and in addition to some of the wider concepts described above – context can have a huge impact on the method(s) used by decision-makers. Other factors include an individual's cognitive style[13], culture[14], risk and information sources[15] and personal bias[16].

The context of the decision impacts the model used. Pidd describes *puzzles* which enables known processes to be applied to solve them; *problems* which can clearly state what needs to be done but not how to do it and *messes* which vary according to clarity of what needs to be done and how it should be done.[17] These references are summarised in Figure 1 and appear to correspond to Obeng's project types[18] (Obeng would add "Foggy" as a project to be undertaken in the top right hand corner of Figure 1).

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[13] Myers, I. *Introduction to Type: A description of the theory and applications of the Myers-Briggs type indicator,* Consulting Psychologists Press, Palo Alto Ca., 1962.

[14] Martinsons, Maris G., "Comparing the Decision Styles of American, Chinese and Japanese Business Leaders." *Best Paper Proceedings of Academy of Management Meetings,* Washington, DC, August 2001

[15] Henderson J., and Nutt P.C., "The Influence of Decision Style on Decision-making Behavior" , *Management Science*, Vol. 26, No. 4, Apr 1980, pp. 371-386

[16] Hinsz V & Jundt D., "Influences of positive and negative affect on decisions involving judgmental biases" *Social Behaviour and Personality: An International Journal* , Vol 30, Issue 1, Feb 2002 , Page(s): 45-52

[17] Pidd, 2004, op cit

[18] E Obeng. *Making Re-Engineering Happen.* Financial Times/Pitman Publishing Management Series: London, 1994.

Figure 1: Types of Issue to be Resolved

OUTCOME

	Clear	Unclear
Clear	PUZZLES (Pidd)	FOGGY PROJECT (Obeng)
Unclear	PROBLEMS (Pidd)	MESSES (Pidd)

PROCESS

Ackoff[19] and Pidd[20] consider *Messes* to be the same as the Rittel and Webber's *wicked problems[21]*. More latterly, Horn coined the phrase "social mess".[22] An excellent summary of these can be found in Poppendieck's[23] on-line article which identifies the criteria summarising thinking on the distinction between *tame* and *wicked problems*.

Conklin considered that, whilst 'tame problems' were fairly well defined and could lead to solutions that could be tested, 'wicked problems' are often difficult to define and frequently relate to "strong moral, political

[19] R L Ackoff. *Redesigning the Future: A Systems Approach to Societal Planning.* John Wiley & Sons: New York, 1974.

[20] Pidd (2004), op cit

[21] H Rittel and M Webber, "Dilemmas in a General Theory of Planning". *Policy Sciences*, Vol. 4, 1973, pp. 155-169.

[22] Horn, R, "Knowledge Mapping for Complex Social Messes". A presentation to the 'Foundations in the Knowledge Economy' at the David and Lucile Packard Foundation. 2001. Found at *http://www.stanford.edu/~rhorn/a/recent/spchKnwldgPACKARD.pdf.*

[23] M Poppendieck, "Wicked Problems." Poppendieck.LLC. [Online], 2002. Found at: *http://www.poppendieck.com/wicked.htm.*

and professional issues". [24] 'Wicked problems' tend to rely on stakeholders who do not, necessarily, agree on key issues; this makes resolution of the problem, or decision-making, even more difficult than otherwise. Also, by trying to solve the apparent problem, this, in itself, can create further wicked problems.

Rittel and Webber summarise the characteristics of a wicked problem to be as follows:

- Wicked problems are unique
- There is no clear resolution of the problem
- There are many stakeholders involved with varying opinions
- There may not be a solution; those that exist may not all be identified
- All solutions have consequences so they cannot be tested
- Wicked problems contain much causality[25]

Rittel and Webber's characteristics align well with the key problems facing SSR practitioners. Political, economic, social, cultural variables can differ even across a range of countries nested in the same sub-region. For example, the security sector-related issues currently facing the Government of Haiti are quite distinct from those challenges facing nearby neighbours. Jamaica, Dominican Republic and other Caribbean destinations pride themselves on their thriving tourist industry – something which has never been able to flourish in Haiti due to its deep history of military juntas, widespread paramilitary coercion and extreme levels of poverty and unproductive economic capacity. [26] Moreover, peculiar lingo-cultural traditions and religious backgrounds further isolate the country's problems. This apparent isolation of Haiti impacts on both the ability and readiness of neighbouring countries and western donor states to extend a hand of support.

Other points from Rittel and Webber's list are also familiar to SSR practitioners. The issue of there being 'no clear resolution of the problem' reminds one of the current situation in Sudan, where many issues will not be resolved until the 2011 Referendum when the people of North and South Sudan will vote on whether the country should remain united or divided. Despite this political dynamic, donor-funded SSR efforts continue unabated, many of which work with options for either

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[24] J Conklin, "Wicked Problems and Social Complexity." CogNexus Institute, 2001 at *http://www.cognexus.org/wpf/wickedproblems.pdf*

[25] See H Rittel and M Webber, "Dilemmas in a General Theory of Planning" in *Policy Sciences*, Vol. 4, 1973, pp 155-169.
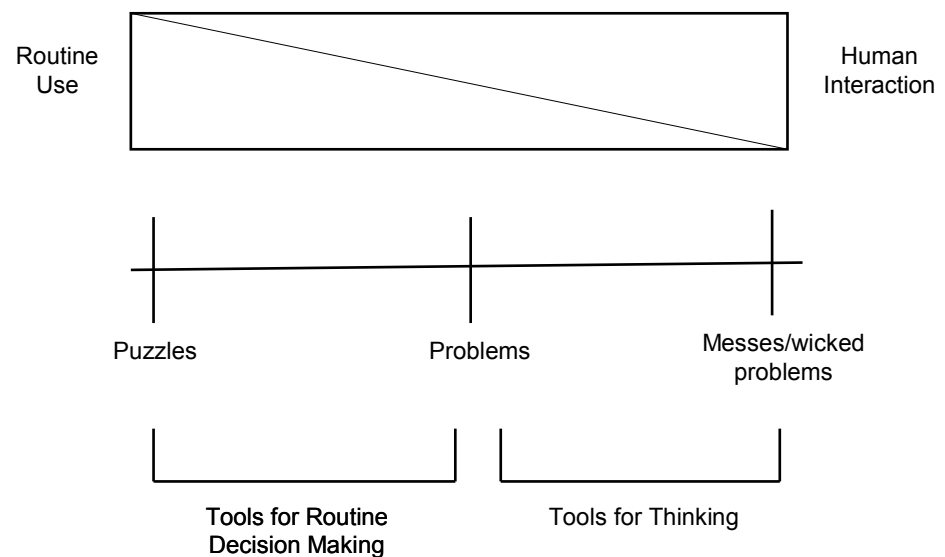
[26] See Johanna Mendelson-Forman "Security Sector Reform in Haiti" in *International Peacekeeping*, Volume13, Issue 1, 2006, p. 15

outcome.[27] For example, efforts to reform the defence forces of the North and South have introduced Joint Integrated Units (JIU) for planning and training purposes. Whatever the referendum outcome, the JIU programme should serve as an important relationship-building and peacebuilding initiative which would support both possible political end states.

Decision-Making within Different Contexts

If, as Rittel and Webber conceptualise, wicked problems cannot be resolved, the extent to which they can be modelled becomes challenged. As depicted in Figure 2, Pidd considers the relationship between wicked problems and the type of modelling approach used.[28]

Figure 2: Modelling Approaches, Puzzles, Problems and Messes

Routine Use   Human Interaction

Puzzles   Problems   Messes/wicked problems

Tools for Routine Decision Making   Tools for Thinking

Pidd, 2004, p8

Based on Pidd's categorization, it is likely that a "tool for thinking" should be considered in order to support SSR decision-making.

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[27] In April 2008, the UK Government's Department for International Development (DFID) tendered a significant contract to provide services for the Government of Southern Sudan in support of its Defence White Paper process and of developing a security decision-making architecture.
[28] Pidd (2004), op cit

Decision-making models

This research considered a significant number of existing models which were qualitative and quantitative in nature, but which could be analysed in terms of their ability to address key issues for SSR decision makers. The methodologies reviewed are listed below, following which is further elaboration of selected models, based on their potential utility for SSR purposes.

- SWOT Analysis
- Delphi Technique
- Paired Comparison Analysis
- Analytic Hierarchy Process
- Critical Path Analysis (CPA)
- Programme Evaluation and Review Technique (PERT)
- Impact Analysis - Identifying the "unexpected" consequences of a decision
- PMI (Plus/Minus/Interesting) Analysis: considers the extent to which possible actions will improve the status quo by assigning positive and negative scores in relation to PM and I
- Game theory: formal study of conflict and cooperation
- Influence Diagrams (Decision Networks): a visual representation of a problem which builds an abbreviated decision tree that focuses more on relationships between events, rather than focusing on outcomes. It is initially qualitative and then quantification is applied
- Morphological analysis - all possible solutions to a multi-dimensional problem complex
- Pareto Analysis: a very simple technique that helps the decision-maker to choose the most effective changes to make based on the 80/20 Pareto principle
- The Kepner-Tregoe Matrix: a systematic approach to evaluating alternatives and making decisions, taking into consideration consequences, their probability and severity
- Nominal Group Technique: group decision-making involving individual's views and rankings being totalled and actions prioritised accordingly
- Grid Analysis: analysis undertaken by comparing the weighted averages of ranked criteria to options; allows a comparison of objective and subjective data.

Qualitative Models

Qualitative models offer enormous advantages, particularly in terms of allowing for multi-stakeholder data consolidation. For example, one of the better known models is the SWOT Analysis, which evaluates the Strengths, Weaknesses, Opportunities and Threats with respect to potential decisions.   The model allows situations to be viewed from an

internal (Strengths and Weaknesses) perspective, and an external (Opportunities and Threats) perspective. The SWOT has great utility for SSR practitioners looking to determine what the critical success factors (CSF) might be and the extent to which they can be achieved.

For example, in a vast area such as Southern Sudan, an SSR programme would be dependent upon effective logistical support. An organisation with an effective logistical network would therefore be in a position to meet the strategic requirement.

Although the SWOT analysis might not lead the decision-maker to the best answer, some have described the model as "a means of summarizing and integrating more formal analyses about the external operating environment and an organisation's current resources and capabilities".[29] In SSR operational environments where practitioners often work with incomplete information, SWOT is a useful tool to assist in identifying potential entry points.

Other structured decision-making models such as the Delphi Technique are also useful for canvassing subject matter expertise. Delphi involves a series of structured questions being sent to geographically dispersed experts, intentionally restricting social interaction. The panel's views are summarized statistically in order to better guide the respondents in the following survey rounds. Thus, although recognised as a qualitative tool, Delphi involves an element of quantification.

Some SSR analysts have commented on the impact of a lack of combined security-development expertise on broader human security issues.[30] For example, one challenge inherent to SSR is the economic wealth creation required to sustain newly developed security institutions otherwise supported by the donor community. To date, it seems as though the most robust analysis applied to wider security-development issues stems from micro and macro economic analyses and not through other more practical disciplines which may offer greater insights to practitioners on the ground.[31]

Some might argue that Delphi – like any survey – is impractical in SSR due to difficulties in recruiting expert respondents. However, any

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[29] Jacobs, Shepherd, Johnson G, "Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis", Chp8 p122, in Ambrosini V, Johnson G., & Scholes K, (Eds) *Exploring Techniques of Analysis and Evaluation in Strategic Management*, FT Prentice Hall/Pearson Education, Harlow, Essex, 1998.

[30] See the argument related to the 'conceptual-contextual divide' in Eric Scheye and Gordon Peake, "To arrest insecurity: Time for a revised security sector reform agenda" in *Conflict, Security and Development,* Volume 5, Number 3, December 2005, pp 295-327.

[31] See, for example, the work of Frances Stewart, and Anke Hoeffler and Paul Collier.

increase in size is usually achieved at the expense of expertise.[32]   SSR is complex and rarefied. Therefore, it can be difficult to recruit genuine experts.

Quantitative

Development donors such as DFID and the European Commission apply Critical Path Analysis (CPA) and Programme Evaluation and Review Technique (PERT) to complex SSR challenges [33] at the project and programme level. At this level, the importance of sequencing activities and parallel processes becomes magnified.

Decision trees are visual, easy to understand and do not rely on detailed factual data. They can focus on possible outcomes (considering consequences and not just benefits) of a number of particular courses of action. In addition to supporting decisions regarding a number of different programme options, decision trees can also be used in conjunction with other models to inform project plans. This supports one of the widespread criticisms of SSR programmes regarding a lack of coherency between strategic and programme levels with the former often non-existent.

Paired Comparison Analysis is another quantitative technique often employed for decision-making across a range of options where each option is compared and scored individually against each other one. Each option's score is then totalled to determine their relative merits. The analysis compares many sets of paired choices by calculating their comparative importance either by using intuition or pre-determined criteria and so offers benefits when decision-makers lack objective data. By analysing options in this way, totally different concepts can be compared and so it can help decision-makers prioritise across a range of strategic options when resources are limited. One weakness of this model is its subjectivity if intuition - rather than specific criteria - is used. Lastly, by focusing on two options only, at any one point in time, each result does not necessarily reflect the whole picture. A more sophisticated Paired Comparison Analysis can be undertaken using Thomas J Satay's Analytic Hierarchy Process which considers multi-levels of decision-making criteria.

The next section will consider two broad types of decision-making methods which led to the development of a more bespoke model which – in the opinion of the authors – best caters to SSR decision-making.

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[32] Taken from Bruce Newsome, *First Quarterly Forecast of Mass Casualty Terrorism*, Reading, UK: University of Reading, 2003

[33] See Alejandro Bendaña, Jeremy Brickhill, Ameen Jan, and Richard Orth*, International Assistance Framework for the Security Sector in Somalia,* A technical experts report commissioned by the UN SRSG
and supported by the EC, UK, UNDP and USA, 2008.

These two categories of models are dual-criteria and multi-criteria decision-making matrices, both of which may be two-dimensional.

Two Dimensional Decision Matrices

Two dimensional decision matrices are decision-making models with a vertical and horizontal axis; these may be simple, with a single criterion being used on each axis (dual-criteria matrices) or more complex, using multiple-criteria along one or more axis.

Duel Criteria Matrices

The Boston Consulting Group Matrix (also known as the Boston Matrix, Boston Box and BCG Matrix) was developed to enable commercial organisations to make decisions about their product or 'SBU' (strategic business unit) portfolio. Each axis requires a quantitative measurement (relative market share and annual market growth). Products (or SBUs) are then plotted and can be classified according to which of the four quadrants they find themselves in. This is shown in table 3.

Figure 3: Boston Consulting Group Matrix
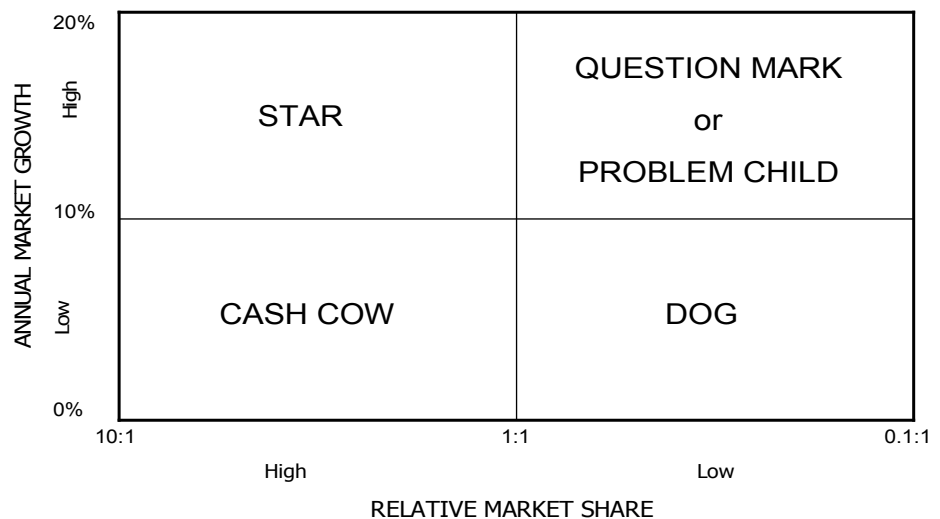
An advantage of this model are that the axes are objective and quantitative and, therefore, easy to measure and use; it also indicates, at a glance, the need to have a balanced portfolio in terms of use of resources.

The main disadvantage is that this model, and others like it, are over-simplistic and the measures selected are not necessarily the best. It also, clearly, has limited applicability in the public sector.

As SSR appears to be a "wicked problem" as previously defined, a relatively simple model such as the BCG Matrix, with two evaluation criteria, may be inappropriate. This may be one reason that the BCG model was adapted for the public sector by Montanari and Bracker in 1986.[34] The Montanari Matrix axes are "Ability to Serve" and "Public Need and Support and Funding Attractiveness". The axes are clearly more appropriate for not-for-profit situations. Unlike the BCG Matrix, the y axis comprises two criteria, allowing the user to consider both the benefit and the cost of the strategy involved.

Figure 4: Montanari Matrix

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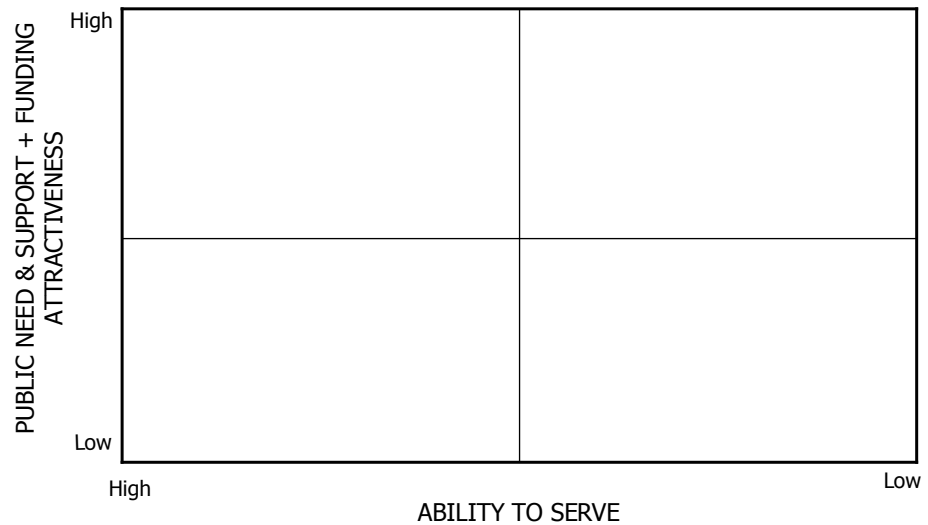
[34]Gerry Johnson and Kevin Scholes. *Exploring Public Sector Strategy.*
Financial Times Prentice Hall, Pearson Education: Essex, 2001, p. 151

Multi-Criteria Decision-making Models (MCDM)

Multi-Criteria Decision-making Models may have two dimensions, where each requires a number of evaluation criteria to be identified. Common characteristics of many MCDM techniques include alternatives (courses of actions) and attributes (decision criteria).[35] Triantaphyllou indicates that the alternatives should be screened and prioritised and, where there are more than twelve attributes (criteria), they should be ranked in terms of importance.[36] MCDM models often use weighting and rating techniques for further quantification.

In business analysis and decision-making, there are several MCDM models used including Abell and Hammond's Investment Opportunity Matrix, with axes "Market Attractiveness" and "Competitive Position", and the General Electric (GE)/McKinsey Multifactor Portfolio Model, with axes of "Industry Attractiveness" (sometimes shown as Market Attractiveness[37]) and "Business Strength"[38]. Both of these are 3 x 3 matrices, one of which is shown in Figure 5. Many references to uses of MCDM can be found in the *Journal of Multi Criteria Decision Analysis*.

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[35] S. J. Chen and C. L. Hwang "Fuzzy Multiple Attribute Decision-making: methods and Applications", *Lecture Notes in Economics and Mathematical Systems*, Sringer-Verlag, Berlin, Germany, 1991, No 375,

[36] E Triantaphyllou, "Multi-Criteria Decision-making Methods: A Comparative Study" in *Applied Optimisation* Vol 44, Kluwer Academic Publishers: Dordrecht, 2000

[37] Kotler P., *Marketing Management*, Prentice Hall, New Jersey, 2000

[38] Wilson M, Gilligan C, Pearson D, *Strategic Marketing Management*, Butterworth-Heinemann, Oxford, 1992

Figure 5: General Electric/McKinsey Multifactor Matrix

BUSINESS STRENGTH
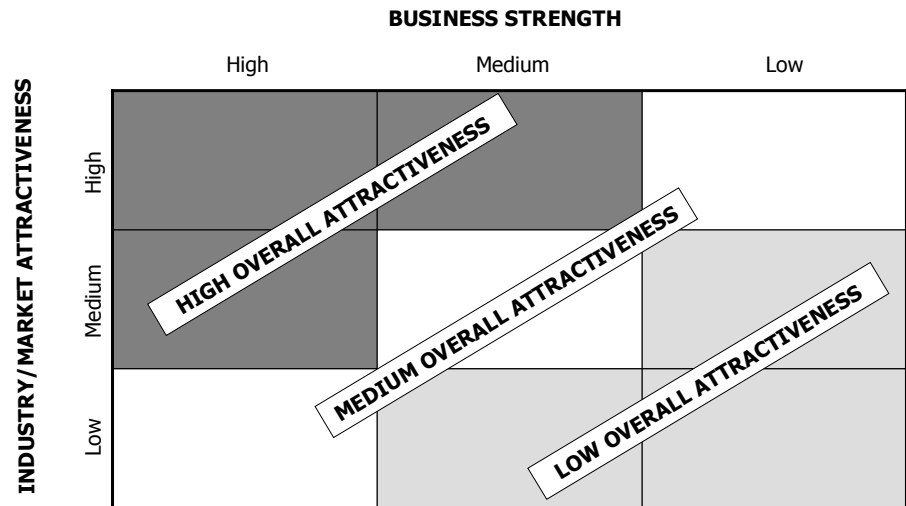
The GE/McKinsey Matrix is useful as a tool for analyzing the attractiveness of an existing or potential market or product strategies. Industry or Market Attractiveness criteria may include high profit, large market size, market growth, low risk or numerous others depending on what makes a market or industry attractive to the organisation. Business Strength criteria may include product quality, price, skills – whatever is required for an organisation to be successful in the identified strategies.

A similar strategic decision-making tool, developed for use in the public sector, is Puffitt's Maslin Multi-Dimensional Matrix (MMDM) which Johnson and Scholes[39] state was developed to overcome weaknesses in the Montanari Matrix. As shown in Figure 6, the two axes of the MMDM are "User Defined Dimensions" and "Needs (or wants) of the Client Group." This model has gone some way in adapting the multi-criteria model to serve public – as opposed to profit – interests, although the axes are not wholly applicable to the special requirements of the SSR context. Like the BCG Matrix, it is a 2 x 2 matrix.

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[39] Johnson G and Scholes K, op cit

Figure 6: Maslin Multi-Dimensional Matrix
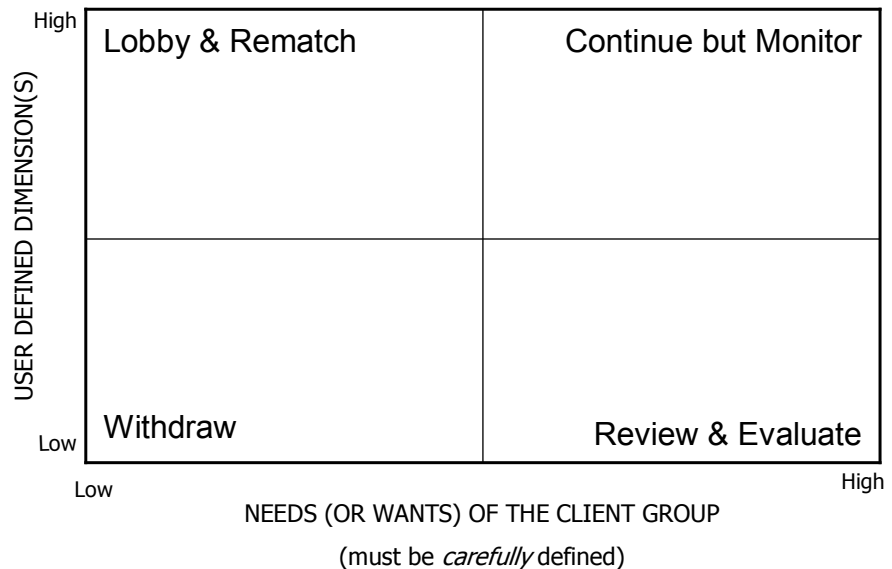
Johnson and Scholes, 2001[40]

Rationale for Developing a Multi Criteria Decision-making Model for SSR

Triantaphyllou stated that "the difficulty that always occurs when trying to compare decision methods and choose the best one is that a paradox is reached, i.e., what decision-making method should be used to choose the best decision-making method?"[41] He concluded that "the development of the perfect decision-making method for rational real-life decision-making still remains an elusive goal".[42] This was found to be true when developing a decision-making model within the SSR arena. The overriding objective of this research was to develop a decision-making model for SSR policy makers and practitioners that would yield the most informed and effective results based on a set of very complex circumstances.

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[40] Ibid, Johnson and Scholes, p. 151
[41] Triantaphyllou, op cit , p. 5
[42] Ibid, p.1

SSR practitioners require decision-making models that respond to a widely consultative process, offer a more 'complete picture', provide ongoing analysis, and appreciate inter-dependencies and sequenced activity. Without being overly complicated, the quantitative nature of these models also offers a good sense of relative prioritization, which is useful when dealing with limited donor funding. It is therefore worth exploring in further detail both dual and multi-criteria models.

Based on the earlier analysis which investigated key criteria influencing the ability to make decisions on SSR programmes and SSR related activities, along with other important considerations that emerged during the critique of a range of decision-making models, the summary below illustrates that there are few models that go some way to meeting the requirements. The evaluation of existing models against these criteria created a challenge as the presentation of data is based on a closed dichotomous question being asked: "Does the model achieve each criterion?" This approach was taken rather than one which asked an open question or used a scale. As one could argue that some models could achieve each criterion to a varied extent, the conclusions may be subject to debate.

Table 1: Evaluation of Decision-making Models

MODEL

	Provides strategic perspective	Allows analysis of option "bundles"	Is user friendly	Can incorporate lessons learned	Applicable to complex problems	Assists timing/sequencing decisions	For multi-stakeholder scenarios	Supports creative and innovative thinking
SWOT	✓	✓	✓	✓	✓		✓	
Delphi	✓	✓		✓	✓		✓	✓
Dual-Criteria Matrix	✓		✓			✓		
Multi-Criteria Decision Matrices	✓	✓	✓	✓	✓	✓	✓	✓
CPA		✓	✓	✓	✓	✓	✓	
PERT		✓		✓	✓	✓	✓	
Paired Comparison Analysis	✓			✓		✓	✓	✓
Impact Analysis	✓	✓	✓	✓	✓		✓	
PMI (Plus/Minus/Interesting) Analysis		✓	✓	✓			✓	
Game theory	✓	✓		✓	✓			
Influence Diagrams (Decision Trees)		✓		✓	✓	✓	✓	
Morphological analysis	✓	✓		✓	✓		✓	✓
The Kepner-Tregoe Matrix	✓			✓	✓		✓	
Nominal Group Technique	✓			✓	✓		✓	✓

As indicated by the table above the utility of multi-dimensional decision-making techniques for SSR deserves further investigation. The table also illustrates the apparent benefits of using both quantitative and qualitative models in an area riddled with inter-dependencies and where programmatic options comprise sets of complex and sequenced activities.

Due to its ability to advise on "bundles" of activity, the MCDM approach also offers a tighter connection between the strategic and operational levels. Moreover, the framework offers consideration of options relative to an 'overall picture' and not just relative to each other.

Applying the Multi-factor Matrix to SSR decision-making

Assuming that the multi-criteria matrix is appropriate for many of the challenges facing SSR decision-makers, this section uses a notional SSR example to demonstrate the utility of the MCDM methodology in SSR.

Observing a selection of existing two dimensional decision models – both dual- and multi-criteria - it appeared that, in each case, one axis focused on the needs of one party whilst the other indicated the likely success factors. These are shown in Table 2.

Table 2: Two Dimensional Model Axes

MODEL	y AXIS (vertical)	x AXIS (horizontal)
Boston Portfolio Matrix	Relative Market Share	Market Growth
Montanari Matrix	Public Need and Support and Funding Attractiveness	Ability to Serve
Maslin Multi Dimensional Matrix	User-defined dimensions	Needs (or wants) of client groups
General Electric/McKinsey Multi-factor Matrix	Industry Attractiveness or Market Attractiveness	Business Strength
Abell and Hammond's Investment Opportunity Matrix	Market Attractiveness	Competitive Position

In the SSR context, the axes selected were 'Strategy Value' and 'Ability to Implement'. 'Strategy Value' indicates that this axis represent the extent to which a broad plan of action may be of value to a certain society in transition where SSR programmes serve as the basis for the consolidated plan of action. Secondly, as the definition of an 'organisation' in these environments can vary enormously – and may even be represented by a group of organizations (i.e. military,

humanitarian, development – or even a 'multi-donor' type of arrangement) – it would also seem appropriate to label the second axis 'Ability to Implement'; a label which could more usefully accommodate a wider and more innovative interpretation of an 'organisation' in these environments.

Thus, under the 'Strategy Value' axis, it is first necessary to brainstorm as many possible criteria as possible in terms of what would be required for the strategy to be of value to the beneficiaries. In doing so, all stakeholders (even if there are only few in the initial stages of an SSR engagement) could come together for such a brainstorming exercise. It would also be critical at this stage to factor in 'lessons learned' from a range of other SSR experiences. Such lessons would have either been recorded by the participating institutions, or be brought to the table due to the knowledge and experience of the practitioners. In an interest to limit the number of criteria, so as not to lose focus on key issues, the group would then prioritise and 'cluster' criteria that were very similar and in some cases synonymous. For example, participants may include criteria such as sustainability, long-term in vision, and local ownership – all of which could arguably be grouped under 'long-term sustainability'.

Having completed the brainstorming of criteria, and having narrowed the list of priority criteria down to 5 to 6 at the most, the criteria are then listed with all the strategic options being considered by participants based on an earlier environmental analysis. For simplicity, we are assuming that in this particular case, two programmes are being considered: Police Reform and Defence Reform. In a more specific experiment based on real data, options would not appear to be as generic as these examples and may extend to specific activities under each category such as 'building academic oversight capacity in support of defence' and 'mentoring strategies within policy offices in the Ministry of Interior'. However, it is also realistic to think that SSR engagements may be initiated under a much broader and better prepared mandate which considered development, economic or migratory programmes which may not normally fall under a typical SSR programme. In this case, generic headings like Police Reform and Defence Reform may be used, certainly as a way of narrowing down priorities before disaggregating priority programmes and prioritizing amongst more specific courses of action.

Calculating 'Strategy Value'

In evaluating 'strategy value' participants would weight the importance of each criterion, followed by rating the strategy against the criteria. The weighting exercise is fairly straightforward and weights each criterion in terms of relative importance. Although weightings usually total 1, it is suggested that these should add up to 30. This is a useful figure not only because the matrix is a 3 by 3 matrix but also because the figure is easily divisible by 5 and 6, the number of criteria selected. It is important to

note that if one out of five criteria being used is far more important than the others, it is conceivable that four criteria could have a weighting of '1' with the fifth criteria having developed a weighting of '26' which could reflect an extreme level of importance, although this would be unusual. This does not suggest that the other criteria are not important because they have still been identified as evaluating criteria.

After weighting the relative importance of the criteria each strategy is scored out of 10 against each criterion in terms of the extent to which either the strategy achieves, or meets the requirements of, each criterion. For example, in the context of the police reform option – and working with a criterion of 'quick impact' - the question asked here would be "is police reform quick impact in nature? Can we see immediate results?" If there is scope for some 'quick wins' within an overall approach to police reform (a more longer-term engagement), then a realistic score out of 10 may be, for example, 6, whereby a score of 10 would mean that the impact would be immediate and a score of zero would mean that all impact would be very long term. It would make the evaluation less subjective if 'quick' were quantified, for example, 'impact within 3 months or sooner'. Scoring would then reflect proximity to 3 months, with 3 months perhaps scoring a value of 8. Table 3 provides an example of both rating and weighting results for police and defence reform programmes.

Table 3: Calculating 'Strategy Value'

(a)	(b)	(c)	(d)	(e)	(f)
CRITERIA	Weight	Police Reform Rating 10=high	Police Reform Weighted Rating	Defence Reform Rating 10=high	Defence Reform Weighted Rating
Quick impact	4	2	8	5	20
Sustainability	3	9	27	9	27
Local ownership	8	3	24	6	48
Low risk	9	7	63	8	72
Achieve objectives	6	4	24	6	36
TOTAL	30		146		203

Columns a and b in Table 3 show that 'achieving objectives' is two times more valuable than 'sustainability' and 'low risk' three times more. It also indicates that Police Reform will not have a quick impact, yet it will be very sustainable.

After rating each strategy out of ten against each criterion (columns c and d), weighted ratings for each strategy against each criterion can be calculated (columns b x c = d for Police Reform and columns b x e = f for Defence Reform). The sum of each set of weighted ratings form the co-ordinates for each strategy for the 'Strategy Value' axis.   In the example provided, the coordinate for Police Reform is 146 and 203 for Defence Reform, with a maximum achievable weighted rating of 300 for each.

This exercise can then be completed for each of the other strategic options being considered by practitioners and policymakers. It should be noted that – in assessing strategy value - the relative weighting for each criterion remains constant to allow direct comparison of seemingly incomparable options.

Calculating 'Ability to Implement'

The next step of the exercise focuses on the other dimension of the matrix – 'Ability to Implement'. The same group of stakeholders would then work together to brainstorm key criteria vital to the 'organisation's' ability to implement each strategic option, for example, available funding, skills and infrastructure. As mentioned above in relation to strategy value, lessons learned from elsewhere could be drawn on to inform the brainstorming exercise. For example, one could ask 'what was necessary for the implementation of other police reform programmes in a relatively similar context?' After brainstorming all possible criteria, the group should prioritise and 'cluster' the criteria to be left with a maximum of 5-6 criteria only for each strategy. They may or may not be the same although it is likely there would be some overlap. The group would then be required to weight each criterion against each strategy to reflect the extent to which each criterion is important in the achievement of the strategy. This approach is different to generating weightings for strategy value as can be seen in Table 4, columns a, d and f. The question asked here, in relation to the first criterion and strategy, could be "how important is funding for police reform to be implemented successfully, relative to the other criteria?" As with the weightings undertaken to evaluate strategy value, overall weightings should add up to 30 but whereas regarding 'Strategy Value' the weightings relate to the importance of the criteria to the 'organisation', with 'Ability to Implement' they relate to the importance of the criteria to each strategy.

Table 4: Calculating 'Ability to Implement'

(a)	(b)	(c)	(d)	(e)	(f)	(g)
CRITERIA	Ratings For Police Reform 10 = high	Ratings For Defence Reform 10 = high	Police Reform Weighting Criteria	Police Reform Weighted Rating	Defence Reform Weighting Criteria	Defence Reform Weighted Rating
Funding	9	9	6	54	6	54
Skills	6	8	6	36	7	56
Infrastructure	6	7	4	24	9	63
Networks	-	6	-	-	5	30
Knowledge	6	5	4	24	3	15
UN mandate	10	-	10	100		
TOTAL			**30**	**238**	**30**	**218**

Once the weightings have been developed for each criterion/strategy, the 'organization' is rated out of 10 against each criterion for each strategy (columns b and c). In rating each criterion, a question to ask could be "to what extent does the organization possess/has access to/reflects this criterion?" In the example, 'funding' has been identified as a criterion for an organisation's ability to implement both strategies – and if there was no shortage of funding – the group might give funding a score of 10 out of 10.

As the criteria may vary for each strategy, so may the 'organisation's' rating against different criterion for different strategies; for example, there may be high level of skills for defence reform (e.g. 8) but just average level of available skills for police reform (e.g. 6).

Once again weighted ratings should be calculated and totalled (columns e and g); each total would be out of a maximum of 300.

Plotting the Results on the Model

The next step in this exercise is to take the coordinates for both 'Strategy Value' and 'Ability to Implement' for each strategic option and plot

them on the 3 x 3 multi-dimensional decision-making matrix as shown in Figure 7.

Figure 7: SSR Strategy Evaluation Matrix

ABILITY TO IMPLEMENT
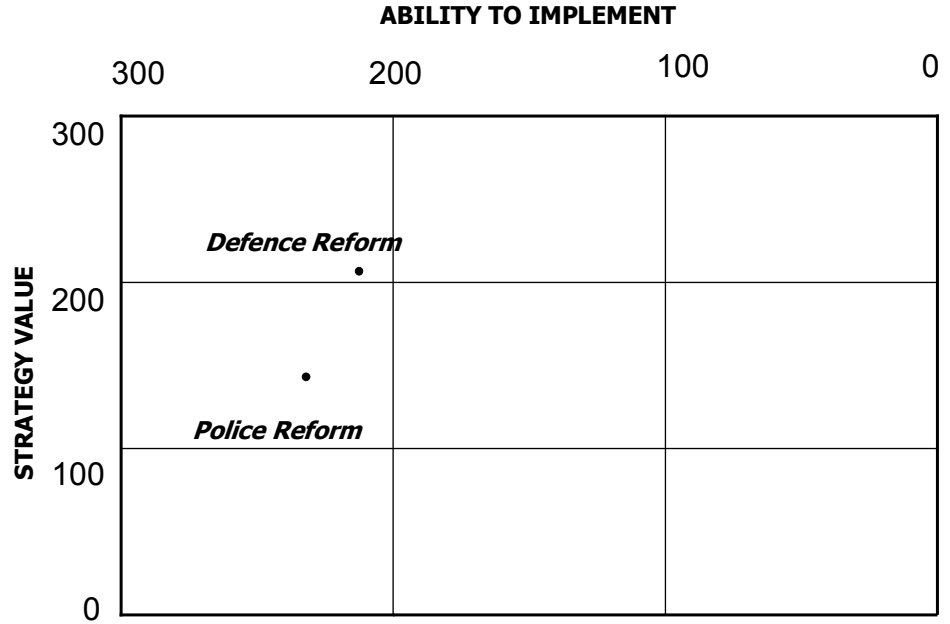
Finally, to further inform decisions the cost (or an approximate cost) of each strategy should be reflected by the area of each circle which should represent the proportion of total spend if all strategies were to be undertaken. Thus the size of the circle would reflect the relative cost of each strategic option and thus inform planning. The example in Figure 8 illustrates that police and defence reform are the only two strategies being considered and police reform would cost twice as much as defence reform. This could be due to the need for redrafting legislation which would restore a number of internal security responsibilities to the police – for which they would need to be properly resourced – and scaled back responsibilities of the military for external security-related tasks only.

Figure 8: SSR Strategy Evaluation Matrix with Relative Costs
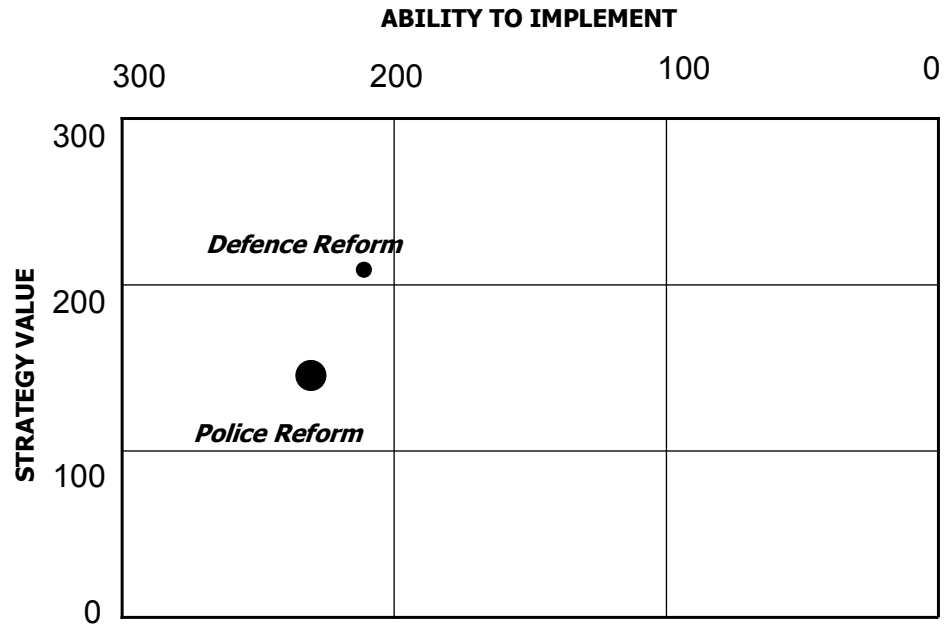
As shown in Figure 9, the strategies can then be seen in terms of potential actions, and, through the ratings of Ability to Implement, the resources required to realise them.

Figure 9: Possible Actions Resulting from the SSR Strategy Evaluation Matrix

ABILITY TO IMPLEMENT

	High	Medium	Low
High	PRIORITY	SELECTIVE 2ND PRIORITY	OUTSOURCE IMMEDIATELY? DEVELOP ABILITY TO IMPLEMENT MEDIUM TO LONG TERM?
Medium	SELECTIVE 2ND PRIORITY	SELECTIVE 3RD PRIORITY	MONITOR IN CASE VALUE & ABILITY INCREASES
Low	MONITOR IN CASE VALUE INCREASES	MONITOR IN CASE VALUE INCREASES	DO NOT CONSIDER

STRATEGY VALUE

Figure 9 demonstrates why a 3 x 3 matrix, as opposed to a 2 x 2 matrix, was used as this provides 9 possible options for each action, rather than 4.

In evaluating the defence and police reform programmes being considered, one can observe the high priority given to defence but also the secondary priority given to police reform. If another option had been assessed as scoring high in terms of strategy value but which the organization in question had limited ability to implement, it would have been mapped into the top right box. If the value of this option was so great it would probably need to be outsourced in the short term, resources permitting then the organization might – over time – develop competencies in this area. Similarly, for strategic options plotted in the bottom left corner, even though the strategic option is not a priority in terms of the overall value of the strategy at the time of evaluation, it may become so in the future and thus needs to be monitored in case its value increases.

However, as results are plotted according to their relative importance, it is sensible to run the exercise over for a second time after discounting a number of programmes which do not warrant immediate or medium-term consideration. Undertaking the exercise for a second time, and based on a reduced number of options considered, might lower the apparent

priority of a number of programmes which may have achieved more favourable and appealing coordinates in the initial round.

Although the options have been evaluated in relation to each other, they have not been assessed collectively. This is an issue regarding achievement of the overall aim of the exercise, sequencing and resourcing and one of the disadvantages identified previously of Paired Comparison Analysis. To overcome this problem and take account of inter-dependencies, a range of 'packaged' and sequenced options should be developed, based on the findings of this analysis, and the process undertaken in relation to those.

In the example, as defence reform is identified as the priority and police reform secondary, timescales may be attributed and the 'package' would be evaluated. If penal reform had been evaluated and assessed as being within the same box as police reform (in Figure 8) but of marginally less value, a number of 'packages' could be evaluated, some of which are shown in Table 5.

Table 5: Strategy 'Packages' for Further Evaluation

	STRATEGY 'PACKAGE' 1	STRATEGY 'PACKAGE' 2	STRATEGY 'PACKAGE' 3	STRATEGY 'PACKAGE' 4
Priority Action	Defence Reform	Defence Reform	Defence Reform	Defence Reform
Secondary Action	Police Reform Penal Reform	Police Reform	Penal Reform	Police Reform
Tertiary Action	simultaneously	Penal Reform	Police Reform	Leave Penal Reform and evaluate later

The process would be repeated and the result may appear as shown in Figure 10.

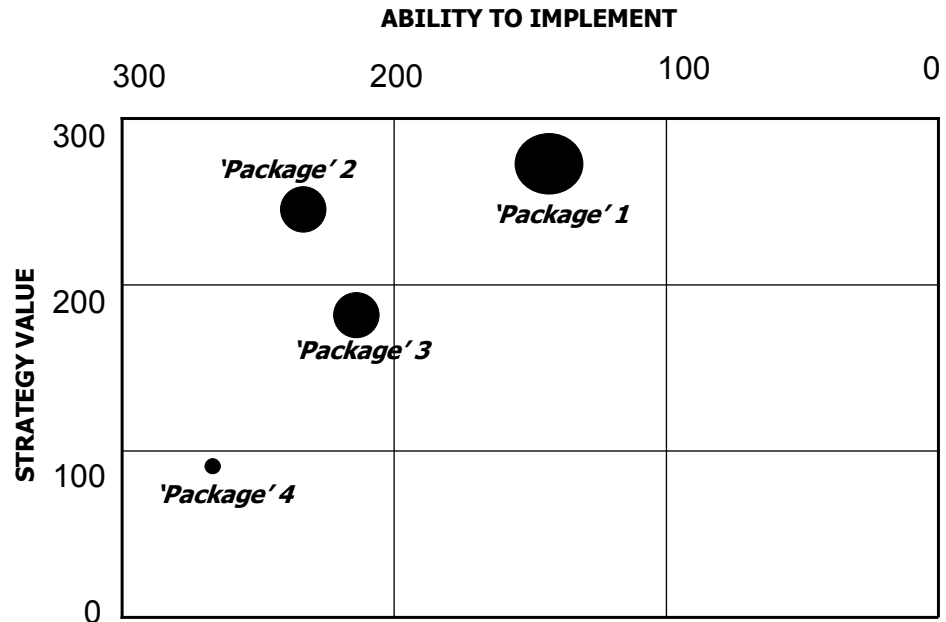**Figure 10: Evaluation of Strategy 'Packages'**

Figure 10 shows that strategy 'package' 4, whilst being the least costly, because only 2 strategies are being implemented within this planning period, it is of least value but, clearly, one which the organisation can most readily implement. Package 1 is of greatest overall value as police reform and penal reform will be undertaken simultaneously but the ability to implement is an issue; this would most likely be due to limited resources at any one time. Not surprisingly, as police reform had been identified as having greater value than penal reform, Package 2 is of greater value than Package 3 as police reform is being undertaken before penal reform. The conclusion here is that Package 2 is the optimum way forward, with Defence Reform being undertaken first, then police reform followed by penal reform.

The final portfolio analysis, offers an effective diagnostic illustration in terms of how SSR programmes should be sequenced. It is important to note that, as this paper is focusing on the MCDM methodology and familiarizing the reader with how this process can be applied to SSR-related decision-making, generic SSR strategies have been used for illustrative purposes above. However, the authors recognise that this methodology can be applied easily to more complex 'packages' of sequenced activity related to both security and development issues.

Conclusions

This paper has explored the utility of the MCDM approach for some of the challenges facing SSR policymakers and practitioners. In doing so, the paper carefully considered key criteria which past experience has shown to affect SSR decision-making processes. Following sections then evaluated a number of models drawn from corporate, public and non-governmental organizational management literature against the criteria. The analysis concluded that the MCDM model would best support SSR decision-making.

An MCDM was then developed and demonstrated using two hypothetical programmatic options which were scored in terms of their relative priority. The process used to develop these results involved a multi-stakeholder approach to developing a list of criteria supporting both 'strategy value' and 'ability to implement'. The consultative nature of this exercise is important due to the fact that the involvement of certain SSR stakeholders is often based on the desired pursuit of one particular option. For example, and based on a pilot test of this methodology used in one country which is currently developing its first national security strategy and workplan, the approach proved to effectively ward off spoilers without affecting overall buy-in across the wider stakeholder group. This was enabled by allowing certain individuals with personal agenda to participate in the development and prioritization of the criteria developed for strategy value and ability to implement. Once these individuals saw that – based on the criteria for evaluation which they had helped develop and contributed to - their individual 'projects' or agenda no longer ranked as having priority, this made it easier to placate these individuals due to the fact that their contribution had helped map out a strategic and innovative way forward.

Beyond the group consultation and wide level of buy-in that this methodology could promote, its merits are also based on its ability to actually use lessons learned as an input to future and ongoing SSR programmes. To date, much criticism has been levied at the fact that organizations rely more on identifying rather than 'learning' lessons. The Strategy Value matrix relies on both positive and negative experiences from elsewhere in order to determine what is required for the strategy to have value, and in terms of the implementation requirements on the ground. Whilst using lessons learned as an input to the model, the Matrix also provides an informed methodology for sequencing. As the donor community becomes more familiarized with project management methods such as CPA and PERT, together with the SSR Strategy Evaluation Matrix, this combined 'toolset' could more effectively support strategic and programmatic coherence across SSR programmes.

This paper has introduced the MCDM Matrix and, based on the way in which this approach responds to a range of issues and challenges impacting on SSR decision-making, has argued for its utility in SSR

environments. Whilst it was beyond the scope of the paper to offer further application, it is recommended that the tool is used by both SSR policymakers and practitioners to assess the current direction of a number of more mature SSR engagements, but also to apply it to a range of options currently being considered in countries just beginning to explore national security priorities and potential SSR programmes.

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