

---

## Pathways for Peace: A Multi-Model Assessment of the Sudanese Comprehensive Peace Agreement

Mark Abdollahian, Ph.D.

Director and Chief Operating Officer  
Sentia Group Inc., and  
Full Clinical Professor, the School of Politics and Economics  
Claremont Graduate University  
Claremont, California, U.S.A.  
e-mail: maa@sentiagroup.com

Michael Baranick, Ph.D.

Senior Research Fellow  
National Defense University  
Fort McNair, Washington, D.C., U.S.A.  
e-mail: Banarnickm@ndu.edu

Jacek Kugler, Ph.D.

Elisabeth Helm Rosecrance Professor of World Politics  
School of Politics and Economics  
Claremont Graduate University  
Claremont, California, U.S.A.  
e-mail: Jacek.kugler@cgu.edu

Sudhir Devalia

National Defense University  
Fort McNair, Washington, D.C., U.S.A.  
e-mail: devalias@ndu.edu

*Dr. Abdollahian possesses a unique blend of academic and entrepreneurial experiences. He has had significant successes in translating core theoretical models from microeconomics & politics into workable solutions for public and private sector clients, including British Aerospace, McKinsey, Raytheon, Motorola, The World Bank, and the US Government. Private and public sector clients employ his skills in strategy creation, risk mitigation, coalition building and interest maximization to achieve bottom line results. Dr. Abdollahian co-founded Sentia Group, Inc. for the mission of empowering both the commercial & public sector with advanced predictive behavior software combining recent advances in agent based modeling with traditional microeconomic tools. He is currently a Director and Chief Operating Officer and has several patents pending. Dr. Abdollahian is also a Full Clinical Professor at the School of Politics and Economics at the Claremont Graduate University where he lectures on advanced methods for applying quantitative computational social science towards strategic decision making. Dr. Abdollahian's research interests focus on the understanding nexus of politics and economics through advanced mathematical*

*technologies. He is coauthor of Power Transitions: Strategies for the 21<sup>st</sup> Century as well as authoring several articles on advanced decision making approaches in political and economic crises. Dr. Abdollahian has lectured to audiences worldwide on tactical and strategic decision-making, including the National War College, the Defense Intelligence Agency, and the Los Angeles Police Department. He is the recipient of several grants and awards, including the John & Dora Haynes Foundation and US Government grants. He holds a BA from Case Western University and an MA and Ph.D. from the Claremont Graduate University.*

*Dr. Michael J. Baranick is a Senior Research Fellow for Modeling and Simulation Technology at the Center for Technology and National Security Policy at the National Defense University (NDU). Prior to his assignment to NDU, Dr. Baranick held a number of policy and technical advisory appointments within the Army. He earned his Ph.D. in Systems Planning and Development from Pennsylvania State University.*

*Jacek Kugler is the Elisabeth Helms Rosecrans Professor of International Relations at the School of Politics and Economics, Claremont Graduate University where he has also served as Director and Chairman. He is the founder of Sentia Group Incorporated. He is the editor of International Interactions. He is the past president of the International Studies Association and the Peace Science Society. His publications in world politics and political economy are widely available in scholarly journals. He is the co-author of The War Ledger, Births, Deaths, and Taxes, and Power Transitions as well as the co-editor of Parity and War, the Long Term Stability of Deterrence, and Political Capacity and Economic Behavior.*

Portions of this work were supported by The Office of the Secretary of Defense and the US Central Command. This paper was prepared for the International Peace Research Association Conference on *Building Sustainable Futures—Enacting Peace and Development* and is reproduced here by permission of the authors.

## OVERVIEW

With the signing of the Comprehensive Peace Agreement (CPA) in 2005, there was a good deal of optimism among Sudanese belligerents, neighbors in the Horn of Africa and the rest of the international community. The deal brought peace and stability to Sudan for the first time in more than a quarter century, and appeared to have put an end to a conflict which claimed more than 2 million lives and displaced another 1 million inhabitants. Unfortunately, the signing ceremony itself guaranteed nothing—two years after the signing of the CPA between the North and South, the Darfur crisis began. Today, the North's intentions regarding the implementation of the CPA remain in question and there exists a real possibility that war will erupt again between the two parties. The conundrum currently facing the international community (IC) is not only to determine what can be done in order to stave off further North-South conflict and reach a lasting peace, but also to anticipate how such a resolution will impact the on-going conflict in Darfur.

Our research examines the Sudan conflict directly, and the Darfur crisis indirectly from a multi-model vantage point. The objective is to show how a suite of complementary approaches provides a far stronger assessment of potential peace or civil war facing Sudan and what, if any, role the International Community can play. We employ three different macro- and micro-political economy modeling approaches from the national, sub-national

and stakeholder levels to obtain a clearer prognosis for ongoing domestic instability and sub-national conflict. First, the Politics of Fertility & Economic Development (POFED) allows us to anticipate the evolution of economic and political dynamics in Sudan at the national level. Second, the Power Transition (PT) model enables us to estimate the likelihood of sub-national confrontation between North and South Sudan before and after a potential partition to be decided in a referendum by 2011. Finally, we employ an agent-based stakeholder model, SENTURION, to understand the consequences of a potential partition among individual political groups, accounting for changes in the capabilities of diverse groups motivated by oil revenues. This combined multi-modeling approach brings into focus the necessary and sufficient conditions for instability by anticipating ‘hotspots,’ the consequences of policy changes and, more importantly, pathways to a sustainable peace.

Figure 1 conceptually lays out our multi-model approach, showing how the strengths of the various approaches are used to complement each other. This approach enables us to arrive at assessments that are firmly grounded in the national political economy context, taking into account the realities of dynamic changes between the North and South and integrating stakeholder-level political behavior and actions. We argue that a dynamic, micro-motivated, macro-constrained approach is superior to one single model.

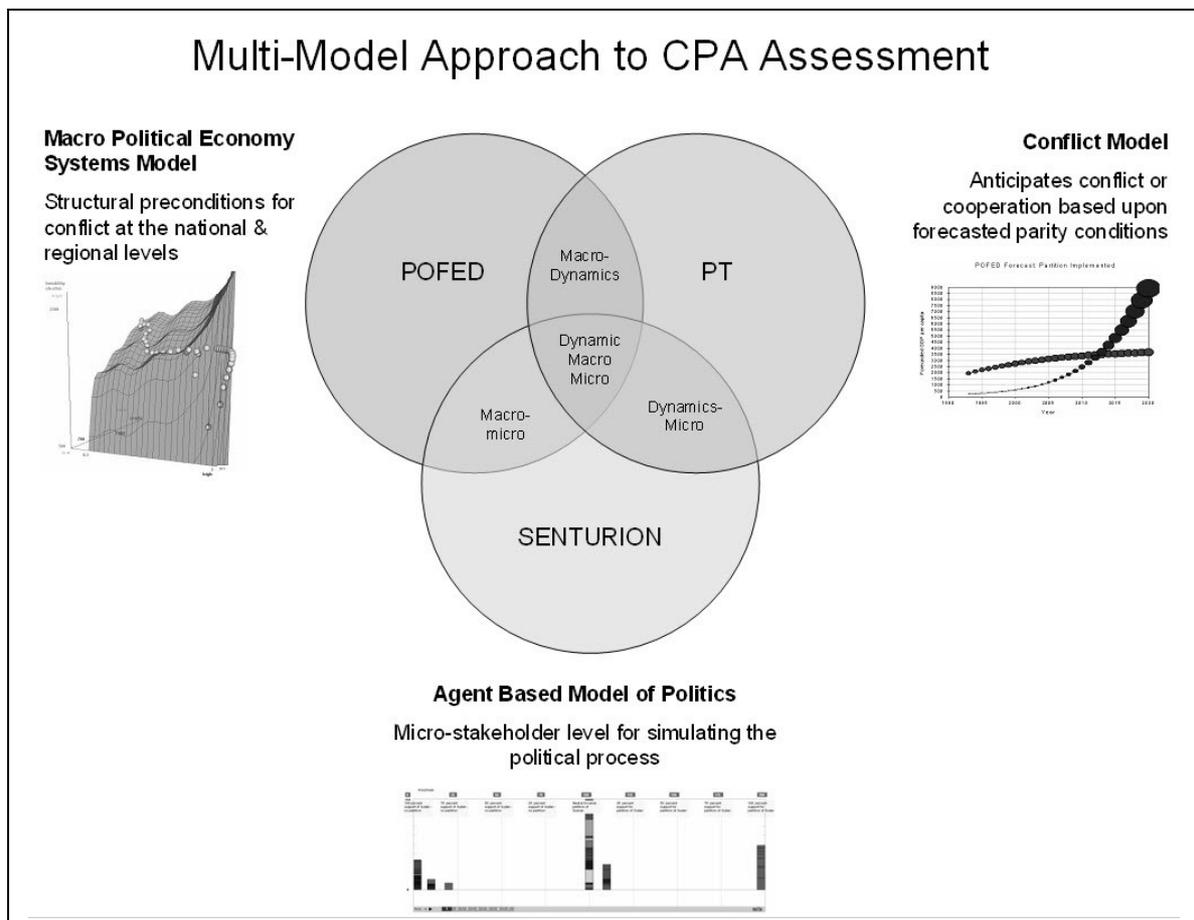


Figure 1: Multi Model Approach.

What role can the IC play in defense and diplomacy initiatives among various international partners in order to achieve stability, prosperity and security throughout Sudan? Our findings indicate that if peace in Sudan is to be sustainable and meaningful, a robust,

non-western and well-equipped international peace-keeping force is needed to investigate reported violations of peace agreements as well as to oversee the disarmament of the militias. There is also a need for a force on the ground to deter any violations of the ceasefire—a force that can swiftly and effectively respond to any such violations that might occur. The key question facing the IC is what steps must be taken to stabilize South Sudan, which has been ravaged by conflict. The following actions by the IC would be positive steps toward stabilizing Sudan, thus mitigating the potential for conflict:

1. Implement the Border agreement and pressure the North to distribute its share of resources and wealth more equitably.
2. Conduct a census that includes religion and ethnicity prior to the 2009 election.

## BACKGROUND

On May 26, 2004, the government of Sudan and the Sudan People's Liberation Movement (SPLM) agreed on six protocols in hope of ending the civil war that has lasted more than 21 years. The signing of these protocols appeared to resolve all outstanding issues between the parties. After five weeks of marathon talks in Machakos, Kenya, both parties signed a framework agreement that many in the IC hailed as a breakthrough. The agreement—brokered by the Horn of Africa's Inter-Governmental Authority on Development (IGAD), with the active involvement of the United States, the United Kingdom, and Norway—calls for a referendum in southern Sudan on self-determination within six years. The declaration restated that the parties have agreed on the following Protocols: (1) security arrangements, (2) wealth sharing, (3) power sharing, (4) southern Blue Nile and the Nuba Mountains, and (5) resolution of conflict in Abyie. Three agreements needed to be finalized in order to achieve a comprehensive peace agreement, including: permanent cease-fire arrangements, the implementation of all signed protocols, international and regional guarantees, and, finally, the one yet to be concluded on permanent cease-fire arrangements.<sup>1</sup>

Although an agreement was brokered between the government of Sudan (GoS) and the SPLM, talks regarding the implementation of the protocols have failed to break new ground and every major deadline for implementation has been missed. In addition, reports of military buildups by both sides have led to greater tension. The CPA set up a Government of National Unity in Khartoum, which included the two main antagonists in the civil war: the National Congress Party (NCP) and the Sudan People's Liberation Movement/Army (SPLM/A). The CPA also calls for the South to conduct a unity referendum in 2011; the southern and northern regions of Sudan will be governed by separate constitutions, under an umbrella constitution for the whole of Sudan until the referendum is passed. During this interim period, Sudan will have two armies: the North's under the leadership of the government in Khartoum, and the South's under the leadership of SPLA.

The lack of inclusivity of interested parties (stakeholders) in the CPA process resulted in an agreement that is effectively a bilateral arrangement between the SPLM and the NCP, for which most people in Sudan feel no sense of ownership. The IC placed great hopes in the CPA to serve as a model to end the conflict in Darfur; however, key stakeholders (SLM/A

---

<sup>1</sup> Simon Roughneen 28 Jun 2007, *World Politics Review*.

and JEM) were kept from the negotiating table by the IC for fear that their inclusion would make the resolution of the North-South conflict impossible. As a result, there remains a marked suspicion of any peace process and doubts as to the commitment of the NCP to resolve the conflict in a sustainable fashion.

Implementation failures by the Khartoum government in the aftermath of signing the CPA have led to problems today. The conflict may be on the verge of reigniting now that former southern rebels have withdrawn from the national unity government and accused the Khartoum government of blocking the peace agreement by failing to remove thousands of its troops from southern oil fields. Although both sides have insisted that they want to avoid a return to war, it might just come to that unless the IC steps in and forces the North to fully implement the CPA.<sup>2</sup> Sudan is scheduled to hold national elections in 2009. In 2011, the South will hold a referendum addressing secession.

If truly open elections are held, the NCP could be in real danger of losing power. People can only pass judgment through elections, but the elections have been delayed and the difficulties in resolving the border issue and ending the conflict in Darfur may result in further postponement. This prospect overshadows all political decisions and makes it difficult for NCP to implement the CPA as designed. If elections and a referendum mean losing power and access to oil, there is no compelling reason to expect the NCP to implement the CPA. The NCP's actions can be seen merely as a delaying tact to ceding power.

Sara Pantulian, from the Overseas Development Institution, does not believe that war is inevitable. However, she does believe that the IC should give serious consideration to the indicators and begin to give political support to move both sides towards full implementation of the CPA. Otherwise, war is certainly a possibility given their history. Some of the remaining contentious issues include the national census, the formation of a unified army, demarcation of a North-South border, better distribution of oil revenues, militia disbandment and disarmament, the future status of disputed regions along the oil-rich North-South border, holding democratic elections in 2009, and, finally, the upcoming referendum in the South on self-determination in 2011.

The inequities that spawned the North-South conflict have not changed. The North is experiencing an oil-fueled economic boom, while the South remains a vast forest lacking roads<sup>3</sup>, reliable water and power, and even school buildings. And like their southern counterparts, the Darfur rebels' basic demands are for more political power, a bigger piece of the national oil wealth and a chance at self-determination. The South's experience is making some Darfur rebels question the wisdom of negotiating with the central government. More importantly, these two crises are inherently intertwined, as any IC intervention in one directly affects the other. Let us now consider how these apparent obstacles to peace can be systematically analyzed using various structural and agent-based approaches.

---

<sup>2</sup> Sudan's north-south truce in trouble By McClatchy Newspapers and The Associated Press [http://seattletimes.nwsources.com/html/nationworld/2003961399\\_sudan19.html](http://seattletimes.nwsources.com/html/nationworld/2003961399_sudan19.html)

<sup>3</sup> South Sudan has only one viable road used by commercial traffic.

## MODEL 1: POFED NATIONAL AND SUBNATIONAL STABILITY ESTIMATES

In order to drill down to a specific course of action that may be beneficial for the Sudan and the IC, we first start with the most macro and aggregate model: Politics of Fertility, Economics & Development or POFED.<sup>4</sup> The approach is a structural equation, systems dynamic model that is empirically estimated to anticipate the behavior of individuals and policy-makers in a dynamic world, while focusing on the antecedents for conflict. The variables of interest include income, fertility, human capital, political stability and relative political capacity. In order to apply the models to ongoing assessments, users can rely on the presentation of results contained in trend graphs or displayed in two and three- dimensional perspectives. The objective is to provide a clear assessment of national- level stability in the country or region under consideration—given a particular data trajectory—and to anticipate the likelihood of conflict, growth and change in demographic capabilities. Such estimates can, in sum, be utilized to assess the longer-term implications of policy changes.

The intuitive logic of POFED is as follows: fragile developing societies are defined by a decline in per capita income, by the potential for falling into the poverty trap, and by low or declining capacity of governments. An important predictor of stability is the extent to which a government extracts resources from its population, measured as relative political capacity (RPC).<sup>4</sup> Weak governments fall below average RPC levels of similarly endowed societies. Robust societies, in contrast, extract more than anticipated from their economic endowment and allocate such resources to advance the government's priorities.

Instability results from the interaction between economic growth and RPC. Weakening states' RPC declines in their ability to extract resources but still perform above expectations. Declining levels of growth leads to a decline in a state's ability to extract resources, though the state may still perform above expectations. Fragile states under-perform in RPC relative to others at comparable levels of development, and continue to lose ground in relative terms. State's experiencing economic expansion may be relatively weak in terms of RPC, yet begin to increase capacity relative to comparable states.

Fundamentally, the interaction between conflict and policy is the focus of our attention. Assistance provided to strong or strengthening states will have positive effects on stability, while similar contributions to weak and, to a lesser degree, weakening states will be squandered. Fragile states that are strengthening are ideal targets for assistance. Societies that are fragile or weakening may require direct action, since funneling aid through their governmental systems is inefficient, increases corruption and will only result in further instability.

<sup>4</sup> For details on POFED, please see: Organski A.F.K, Jacek Kugler, Timothy Johnson and Youssef Cohen. 1984. *Births, Deaths, and Taxes* Chicago: University of Chicago Press. Marina Arbetman and Jacek Kugler eds. 1997. *Political Capacity and Economic Behavior* Boulder, CO: Westview Press. Yi Feng, Jacek Kugler and Paul Zak 2000. "The Politics of Fertility and Economic Development" *International Studies Quarterly* (44,2). Yi Feng, Jacek Kugler and Paul Zak 2002. "Population Growth, Urbanization and the Role of Government in China: A Political Economy Model of Demographic Change" *Urban Studies*, (39,12). Yi Feng, Jacek Kugler and Paul Zak 2002 "Immigration, Fertility and Growth" (2002) with Yi Feng and Paul J. Zak, *Journal of Economic Dynamics and Control* (26, 547-576). Yi Feng, Jacek Kugler and Paul Zak 2006, "Path to Prosperity: A Political Model of Freedom, Demographic Change and Economic Development" mimeo.

POFED anticipates the path of likely national and sub-national level instability driven by a combination of several factors. As Figure 2 shows, we explicitly recognize the important non-linear interactions between political instability, productivity per capita and political capacity. This three-dimensional phase portrait shapes political trajectories of the interactions between demographic changes, human capital variations, improvements or declines in the ability of the government to exercise political capacity, and the effects of capital investment in the society. The non-linear character of this model improves its effectiveness with minimal variables, which can directly translate into actionable elements in the future. For example, the impact of capital changes co-mingles domestic and foreign investment. From a policy perspective, an embargo prevents a portion of the investment community to enter the country, thus the effects of such an intervention can be directly calculated by partitioning the capital variable into its components.

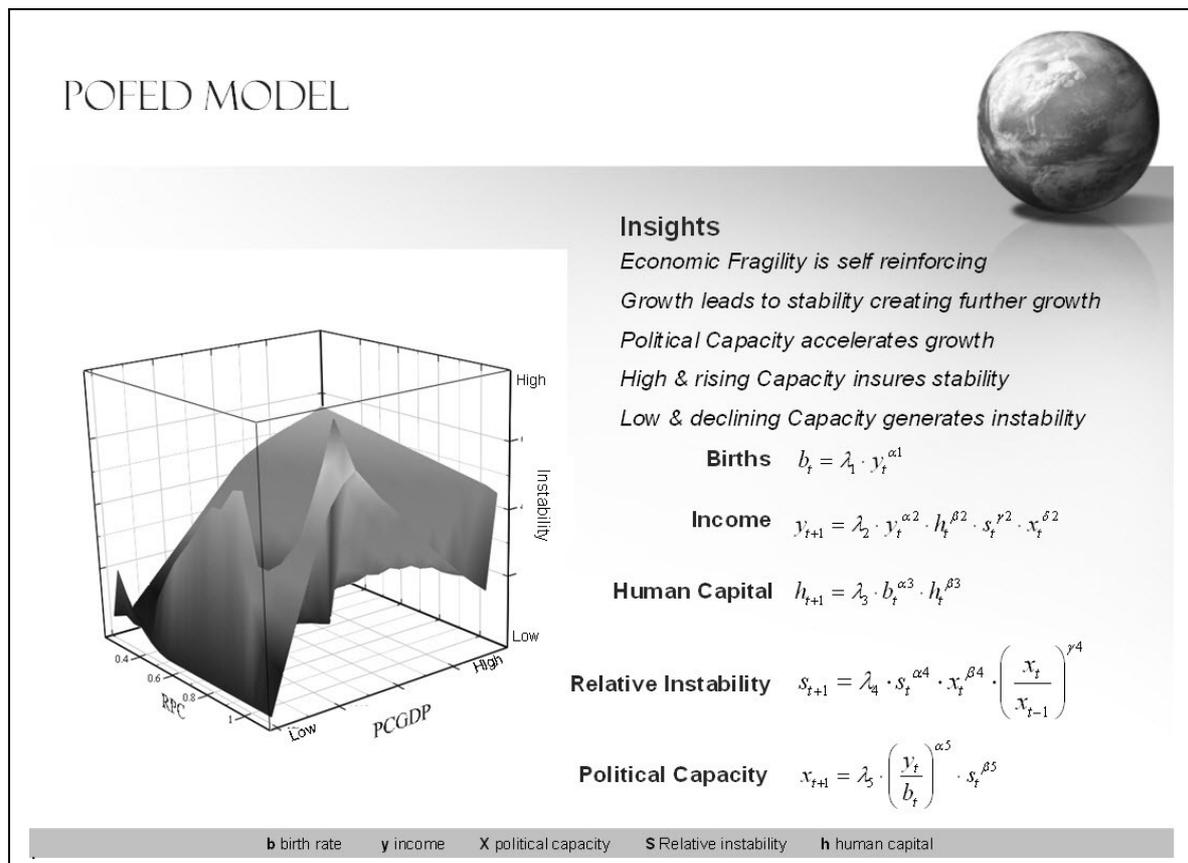


Figure 2: POFED National Level Approach.

Figure 3 depicts POFED estimates for Sudan in GDP per capita, RPC and political violence space. A three-dimensional hypersurface is generated using the empirical estimates of the model’s coefficients given Sudanese data. Notice that at the national level, instability will likely remain high at low levels of political capacity, but instability declines very rapidly as the government gains capacity and reaches normal performance. The trajectory of yellow dots indicates the anticipated reduction of instability as political capacity rises.

Note that below subsistence levels, as measured by GDP per capita, instability ceases as populations disappear. Moreover, marginal increases in income at low levels of political capacity result in the steady increase of conflict. In contrast, however, a massive drop in instability is anticipated when political capacity rises—even with relatively low levels of

economic gain. If, on the other hand, large gains in income take place *without* a concurrent rise in political capacity, the POFED model anticipates a rapid rise in instability. This is a very realistic scenario for Sudan. If oil revenues rapidly increase income levels but there is no concurrent increase in the level of political capacity, one can anticipate serious instability associated with such gains. Mitigation strategies must focus not on external intervention, but on the buildup of domestic political infrastructure that is capable of utilizing and distributing anticipated oil gains.

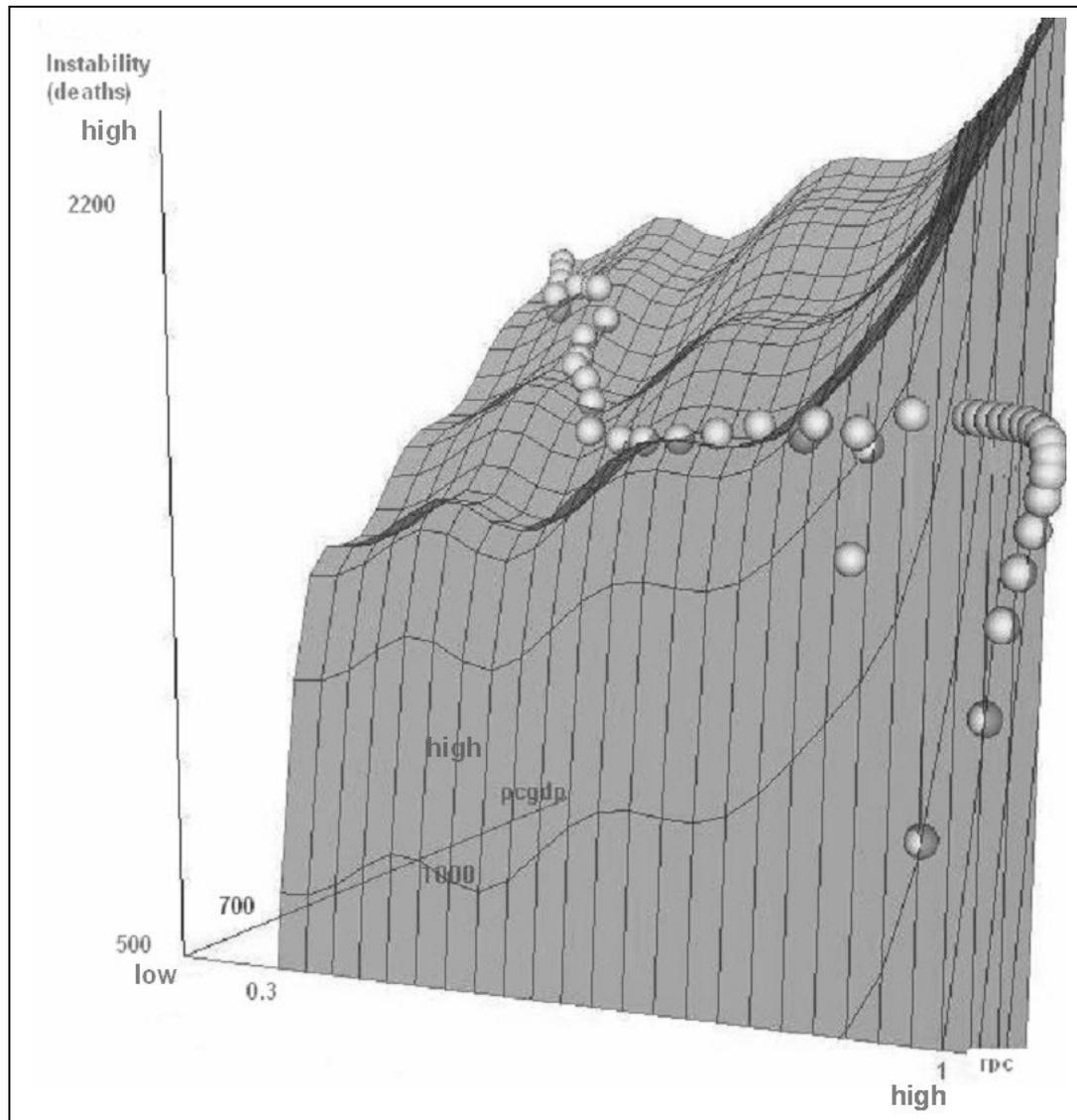


Figure 3: GDP, RPC, and Instability POFED Estimates.

POFED analysis also shows that variations in political capacity impact instability far more than variations in economic productivity. A political approach that directly bolsters the government, rather than economic assistance, thus seems more conducive to the goal of fostering a sustainable peace. With regard to the upcoming 2011 referendum on integration or partition, we also applied the same POFED logic at the sub-national level. We anticipate the following changes in structural conditions within North and South Sudan as shown in Figure 4.

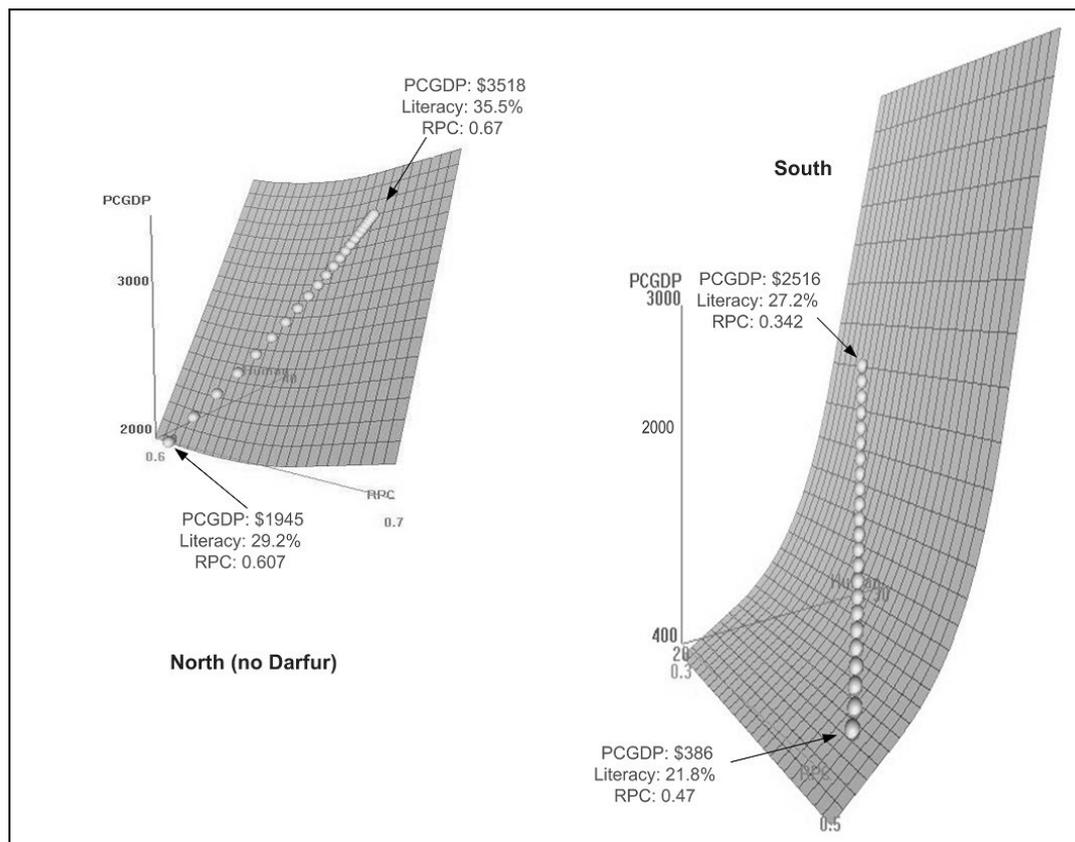


Figure 4: North v. South Subnational Partition.

Estimates of political capacity, GDP per capita and instability for each of the two regions show that the South is far poorer and less developed than the North. However, the South, based on potential oil revenues, is capable of accelerating its growth to a level equal to that of Saudi Arabia following World War II according to POFED results. This relatively small region with only 12 percent of the population and limited infrastructure can become a major oil producer within Africa in the next ten years. On the other hand, the North has less oil production to date, but new discoveries may change this picture dramatically in the next few years.

The concern with oil revenues is substantial because no amount of aid, foreign or domestic investment in commodities other than oil, subvention or loans can compare with the direct impact of anticipated oil investments. China and Malaysia are currently the largest investors largely because of voluntary sanctions imposed on Western interests in the area. Were these policies to change, particularly in relation to the Christian/Animist South Sudan population, one would anticipate resistance from the Muslim population supported by Egypt and the Middle Eastern oil producers that dominate OPEC.

**MODEL 2: POWER TRANSITIONS REGIONAL PERSPECTIVES**

Sudan is divided into four potentially antagonistic regions: the South, North, East and Darfur. These aggregations represent the regional divisions in Sudan that coincide with the main

religious, ethnic and cultural divisions within the country.<sup>5</sup> We believe that the most serious area of dispute is between the North and South. A critical aspect of this difference that may drive conflict is the allocation of revenues. As such, we focus our second modeling approach on North-South competition.

The Power Transition model uses outputs from POFED to generate anticipated levels of capabilities at the sub-national level. From the power transitions perspective, regional conflicts among organized groups increase when their capabilities are equal and dissatisfaction is present. However, when parties are satisfied with the regional or domestic norms, cooperation and nation-building can proceed. These patterns have also been documented empirically at the global, regional and sub-national levels.<sup>6</sup>

Our analysis of the reapportionment of oil resources shows very dramatic changes if the CPA agreement is implemented at different levels. We present four likely sub-national power sharing scenarios: (1) continuation of the status quo, (2) North dominates, (3) South dominates and (4) successful implementation of the CPA in Figures 5, 6, 7, and 8 below.

In Figure 5, the “Status Quo” scenario, it is clear that if the North continues its practice of transferring to the South only a portion of the oil resources agreed to in the CPA, the relative standing of the two sides will remain approximately the same. However, this violation of the CPA agreement will increase regional dissatisfaction, making the South likely to vote overwhelmingly for partition in the referendum scheduled for 2011. Under these circumstances, if a confrontation over partition or its implementation takes place post-2011, the North is expected to gain control of all of Sudan. Only direct foreign intervention can affect this outcome, and the West has the capability to exercise this option. However, Egypt and other Middle East oil producers will be inclined to support the North. The stakeholder analysis below shows that direct actions by the IC can help reverse this outcome. The long-term outcome of such action is unclear, however. A more specific, stakeholder-level analysis would be necessary to anticipate the likelihood of escalating violence motivated by the mobilization of anti-Western, fundamentalist groups.

Figure 6 displays the “North dominates” scenario. In this simulation, the North keeps most of the oil resources, and relations between the North and South remain unstable over time, the asymmetric distribution of oil revenues between the North and South determines the future of the region. Figure 6 indicates that if the North increases its allocation of oil, it will

<sup>5</sup> Ethnic Groups: Blacks 52% (18.8 mill); Arab 39% (14.1 mill); Beija 6% (2.2 mill); Others 3% (0.8 mill). Religious Groups: Sunni Muslims 70% (25 mill); Christians 5% (2 mill); Indigenous beliefs including animists 25% (9 mill). Regional Population Distribution North Central 59.5% (22 mill) Majority Arab Muslim . South 16% (6 mill) Majority Black Christian & Animist. Darfur 18.5% (7 mill) Majority Black Muslim. East 6% (2 mill) Mixed.

<sup>6</sup> For details on the Power Transition Model, please see Power Transition Model. Organski A.F.K, and Jacek Kugler. 1980. *The War Ledger* University of Chicago Press. Organski A.F.K., and Marina Arbetman. 1993. *The Second American Century in Behavior, Culture and Conflict in World Politics*, edited by William Zimmerman and Harold K. Jacobson. University of Michigan Press. Kugler Jacek and Douglas Lemke, 1996 ed. *Parity and War* , University of Michigan Press. For formalized dynamic models of power transitions, see Mark Abdollahian, In Search of Structure, 1996. Tammen Ronald L. et al. 2000. *Power Transitions: Strategies for the 21st Century*, New York: Chatman House. Jacek Kugler, Ronald Tammen and Siddharth Swaminathan 2001. “*Power Transitions and Alliances in the 21st Century*”, *Asian Perspective* (25,3). Efirid, Brian, Jacek Kugler and Gaspare Genna. “*From War to Integration: Generalization of Power Transition Dynamics*” 2003. *International Interactions*, (29,4). Jacek Kugler 2006. “*The Asian Assent: Opportunity for Peace or Precondition for War?*” *International Studies Perspective*, 7,1.

increasingly dominate Sudan. Under such conditions, the North may be further emboldened in domestic conflict, but in all likelihood the preponderance of the North is preserved or enhanced, and the likelihood of conflict *decreases*.

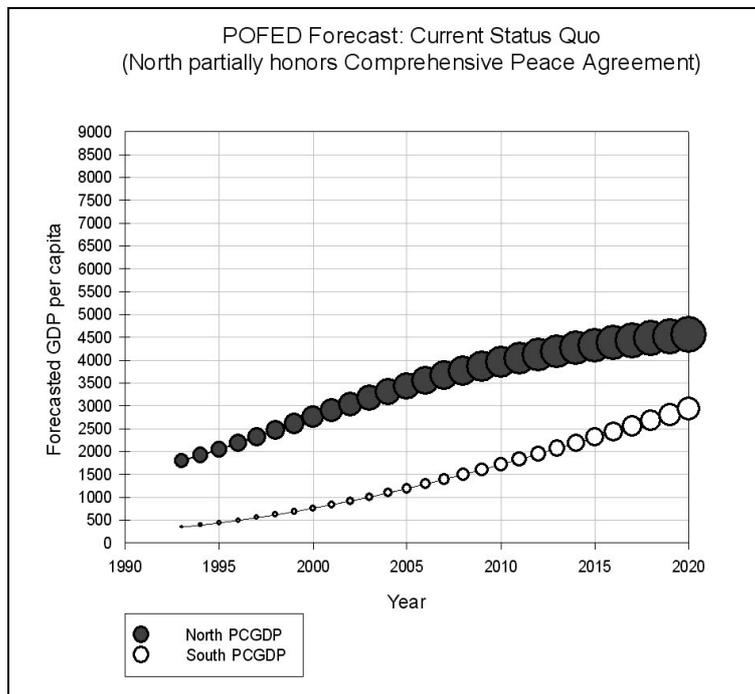


Figure 5: Status Quo Scenario.

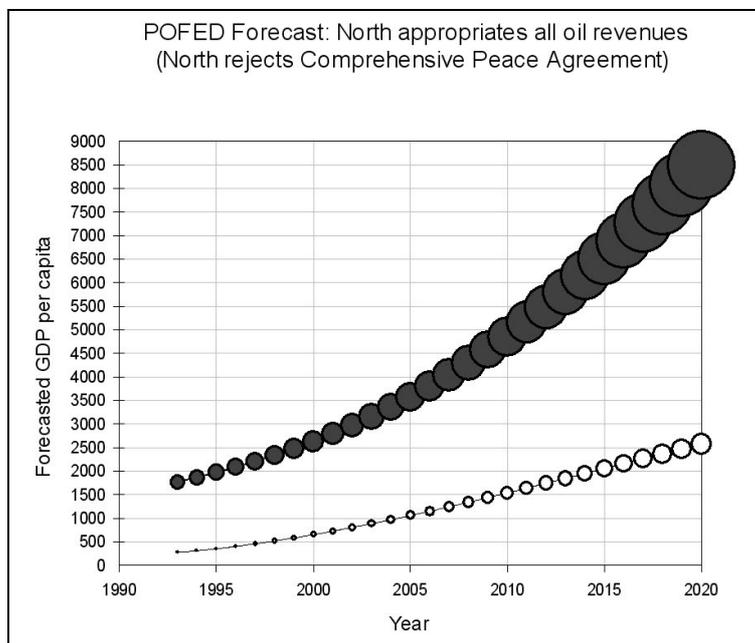


Figure 6: North Dominates Scenario.

Figure 7 presents the unlikely “South dominates” scenario. This outcome results in the event that all the resources from oil revenues originating in the South are allocated to that region. Under such circumstances, southern Sudan would economically outpace northern Sudan between 2010 and 2015. If the South could gain control over its own oil revenues—

most likely in the event of government collapse in the North—the South would overtake the North around the partition date and would dominate this region in the long-term. In effect, the very low political capacity in the South will challenge internal stability. If the South were to become a separate national entity, the most difficult challenge would be to create competent political and social infrastructures that could absorb the anticipated enormous oil revenues. Moreover, our model predicts that the overtaking process will produce the preconditions for confrontation. If either the North or South remains dissatisfied with the conditions of partition, a return to civil war is likely.

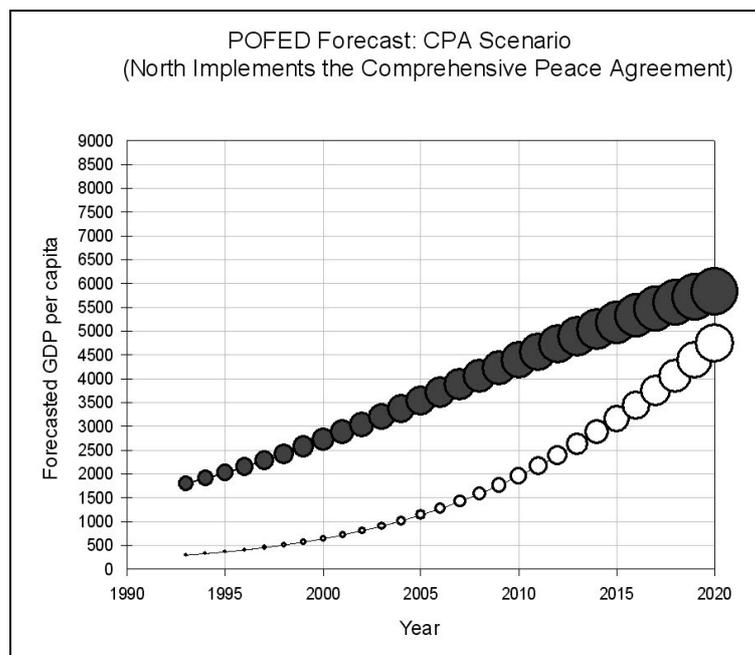


Figure 7: CPA Implemented Scenario.

Finally, Figure 8 shows anticipated outcomes under a successfully implemented CPA scenario. If the South retains its share of oil revenues according to the 2005 agreement (including a 50/48 split with 2% going to the ORSA fund), the results show that southern Sudan will achieve economic parity with northern Sudan by 2020. Partition is going to be decided in the referendum of 2011, at which point the North will still dominate the South. If either side remains dissatisfied prior to or following the partition, as is currently the case, conflict is likely due to parity conditions as forecasted by the power transitions perspective. However, compliance with CPA would indicate a strong commitment by the GoS to a peaceful partition, which is also favored by the international community and many neutral African nations. Under these conditions, our third model, SENTURION, indicates that this approach provides the most likely opportunity for a peaceful partition at the stakeholder level. Given the four different scenarios, the PT perspective indicates that the implementation of CPA presents the best chances for—and likely means to achieve—stability in Sudan, even though partition is likely.

### MODEL 3: SENTURION STAKEHOLDER LEVEL RESULTS

In order to further develop these insights, we turn to an agent-based analysis using SENTURION. This micro-level analysis used information on more than two-hundred

stakeholders from southern, northern, and eastern regions of Sudan, from Darfur, and from foreign and international institutions active in Sudan to analyze the potential reactions to the referendum on partition in 2011. SENTURION is a stand-alone, COTS, political simulation tool developed by two of the authors at the Sentia Group. SENTURION is an agent-based model of politics that incorporates several microeconomic and political theories in order to simulate the pulling and hauling of the political process. Using data generated by subject matter experts, the analysis forecasts the evolution of the political landscape on divisive issues, evaluating resultant coalitions that shape political outcomes. SENTURION incorporates multi-dimensional tradeoffs, sensitivity, Monte Carlo and social network analysis as well as adaptive planning capabilities to empower decision makers to choose the best courses of action for a particular need.

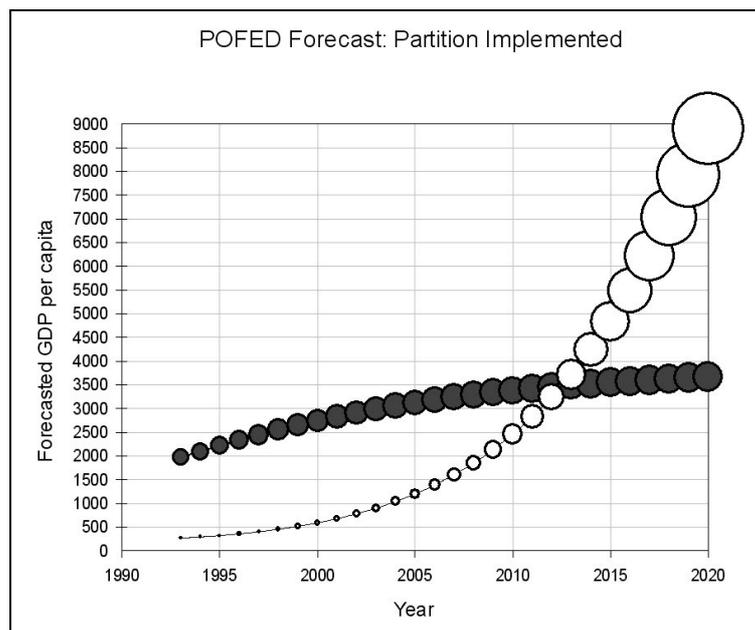


Figure 8: South Dominates Scenario.

Model inputs are limited to the following: (1) stakeholder identification, (2) establishing the group they belong to, (3) determining the relative influence of each group and each stakeholder within the group, (4) defining the position advocated by these stakeholders and (5) assessing the level of interest each has in maintaining their preferred outcome. SENTURION results are game-theoretic driven, agent interactions that are proved to produce accurate assessments and isolate opportunities for the implementation of desired actions.<sup>7</sup> The model's methodology is outlined in Figure 9.

<sup>7</sup> For details on Senturion, please see: Defense Intelligence Agency, *Predictive Analysis Requirements & Research*, February 2005; Jacek Kugler and Yi Feng ed 1997, *The Expected Utility Approach to Policy Decision Making: International Interactions*, volume 23. Mark Abdollahian and Carole Alsharabati, 2003, "Modeling the Strategic effects of Risk and Perceptions in Linkage Politics" *Rationally and Society*; Mark Abdollahian, Michael Baranick, Brian Eford and Jacek Kugler *Senturion: Predictive Political Simulation Model* (2006) *Defense and Technology Paper* 32, Center for Technology and National Security Policy, National Defense University. Also see [www.sentiagroup.com](http://www.sentiagroup.com).

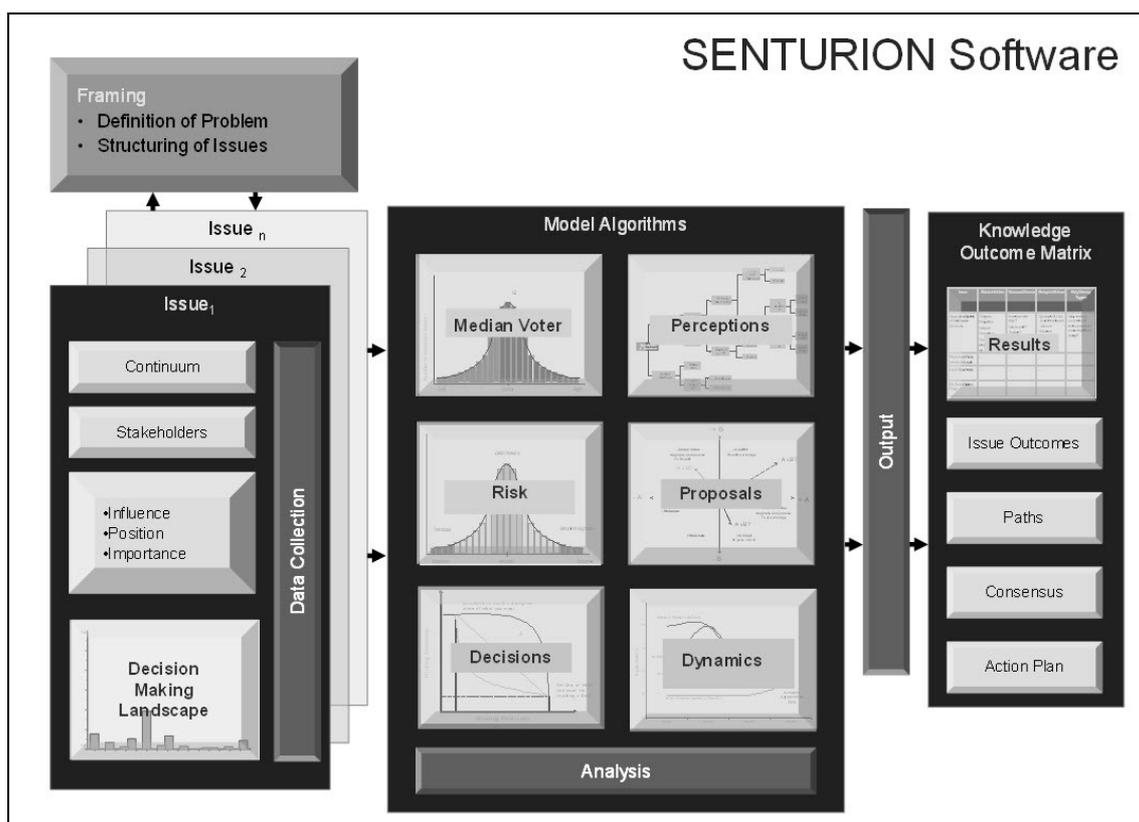


Figure 9: Senturion Micro-Level Approach.

For Sudan, we focused our stakeholder analysis on the effects of a possible North-South partition of the country, as suggested by the aggregate analysis. Our stakeholder-level analysis is based upon the full implementation of the CPA, as well as upon the central issue of oil revenues allocation. While this is not the only contentious issue, our findings suggest that this is the most critical point of contention—its outcome will determine whether there is a continuation of conflict or cooperation in this region.

In general, stakeholders in the North supported by Egypt—the dominant power in the region—oppose partition. While there are some differences in the degree of opposition, no northern stakeholders support splitting Sudan. Stakeholders in the South, on the other hand, are equally determined and committed to implementing partition.

Given the political landscape, SENTURION anticipates that neither side will give ground in the foreseeable future. A major finding is that international players including the United States and western nations, who have the largest pool of potential capabilities in Sudan, are currently neutral. These key actors have the strongest leverage for change in Sudan as Figure 10 illustrates. Simulations based on these facts show that the South Sudanese Government has the opportunity to persuade the United States and Britain to support partition. Were they to make this diplomatic move at this time, the results would alter the political situation dramatically as illustrated in Figure 11.

Currently, the South Sudanese Government is capable of persuading the United States and Britain to support partition. Pursuit of this option results in other western and international stakeholders following and legitimizing the South's demands for partition. Eventually, support for partition will overwhelm the North's ability to counter such demands.

However, such a course of action provokes North Sudan, Egypt and most Middle Eastern, Muslim nations. They would not be capable of preventing a partition but would likely initiate covert military action to reduce the likelihood of its implementation. To prevent such action, Egypt should be consulted and persuaded that their interests are consistent with partition, which could prove to be very difficult.

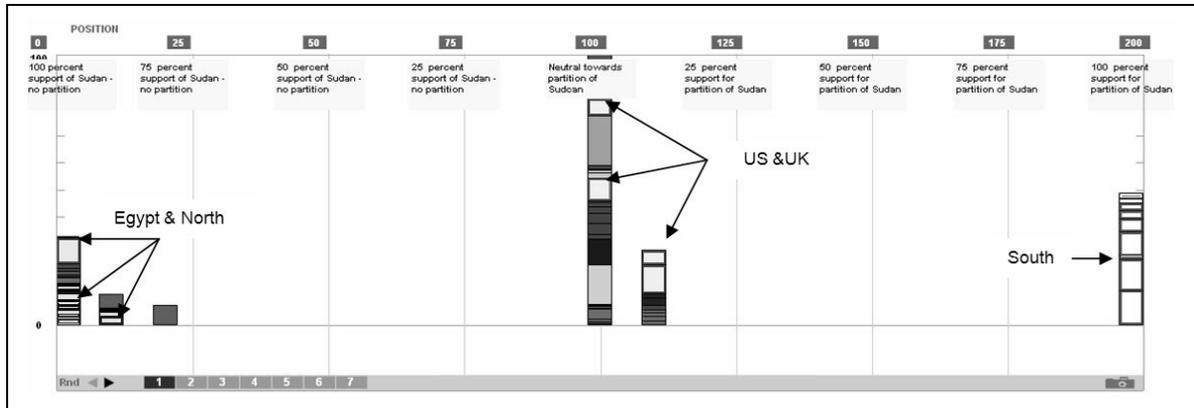


Figure 10: Distribution of Stakeholders on Political Partition Landscape.

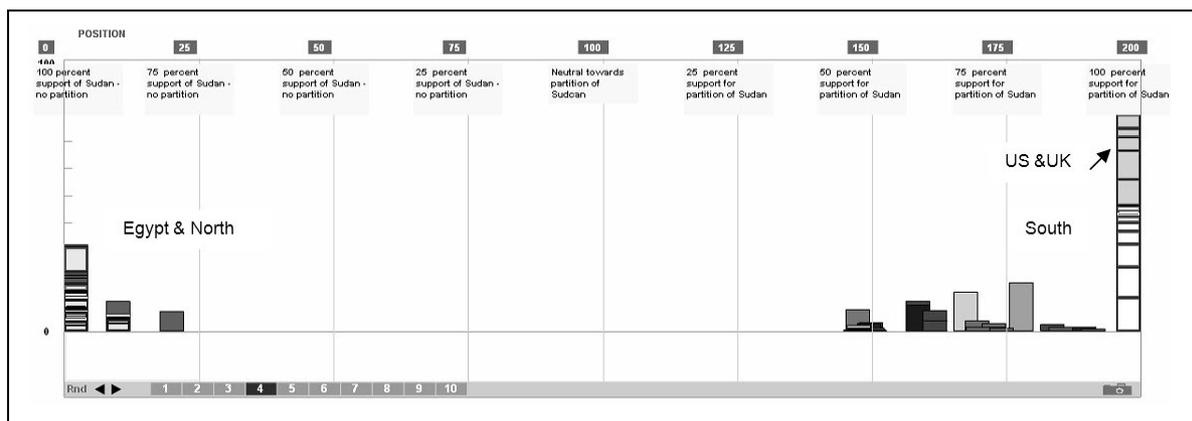


Figure 11: Distribution of Stakeholders on Political Partition Landscape given GoS Initiative.

Additional simulations indicate that the South has only a short period of time to take a diplomatic action that favors partition. Under the current distribution of oil revenues, the North will continue to develop economically and over time will also gain support from the US and the West. If conditions do not change, the North’s oil revenues will propel them economically past the South by 2011. Under these conditions, North Sudan can prevent a partition by force if necessary, and intervention by western powers is no longer viable since most will oppose the partition of Sudan.

## CONCLUSIONS

Our analysis shows that the fundamental aspect of the Sudan dispute revolves around the distribution of oil revenues and power-sharing. A solution to the oil issue would provide a

major impetus to diminish the probability of partition. Failure to implement the oil distribution aspect of the CPA agreement, on the other hand, is likely to increase tensions and lead to the revival of open rebellion in the South.

A proactive stance by the United States can reduce the likelihood of this conflict leading to partition and escalating if partition is the South's choice. One way to do so is to lift sanctions against South Sudan, concentrating on areas associated with the expansion of oil production and its management. If the South becomes capable of running its oil industry and retains the agreed-upon portion of oil revenues, a stable environment can be created prior to 2011. In the interim, the North and South can attempt to produce a political reconciliation.

If partition is the choice in 2011 the same policy is likely to limit the level of conflict. Only a more capable South can form a stable and effective government. The United States can help in this area. Our analysis demonstrates that weakening the government in the North would result in a much higher probability of conflict between the North and South. More direct action is likely to destroy the fragile government and lead to an escalation of domestic instability. Moreover, direct action would bring Egypt into conflict with foreign forces if partition is seen as a viable option, and this would in turn spread the domestic confrontation from within Sudan to the entire Horn of Africa.

Finally, if any action is taken, the time to do so is now. As oil revenues increase the relative capabilities of parties in Sudan that acquire them, the likelihood that foreign action can lead to a peaceful solution diminishes.