PROPOSAL OF A 'GOLDILOCKS' METHODOLOGY FOR THE ASSESSMENT OF AN INTERNATIONAL CRISIS

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ABSTRACT

Through a well-known metaphor in the Anglophone literature, this paper addresses the value of a proposed methodology for the analysis of complex international crises, by stating that the Systems Thinking and System Dynamics approaches can constitute the common ground between the need to develop a full scale and time-consuming systemic understanding of the area and the pressure to get the action going before is too late: a "Goldilocks" approach (which is just right), that is a phased approach that neither leads to a too linear and simplistic model, which would surely lead to timely, yet inevitably ineffective, courses of actions, nor to a too "brain-intensive" one, which would, eventually, produce a more accurate and detailed comprehension of a crisis but with a high risk of eroding massively the little precious time available for intervention. Also, we will propose a possible Crisis Archetype, which, in our perspective and experience, can easily be recognized in every Crisis Situation and that can thus be considered in order to gain insights into the Crisis being analysed. All this will be operationalized through an applied case of a recent International Crisis, still active today: the crisis in Mali.

Keywords: Defense, Conflict, Military, Insurgency and Counterinsurgency, Social Unrest, Crisis management, Operations Planning, Complex Systems Understanding, Policy Modeling, Systems Thinking, System Dynamics, Computer Simulation

1. INTRODUCTION

[…] At the table in the kitchen, there were three bowls of porridge. Goldilocks was hungry. She tasted the porridge from the first bowl. "This porridge is too hot!" she exclaimed. So, she tasted the porridge from the second bowl. "This porridge is too cold," she said So, she tasted the last bowl of porridge. "Ahhh, this porridge is just right," she said happily and she ate it all up. […][1]

The problems faced by the International Community are increasingly complex. The environment in which crises develop and interventions take place is characterized by many actors, acting with extreme freedom of movement, in pursuit of interests and ambitions that are sometimes legitimate ones, other times quite the opposite. In this inextricable tangle of "stakeholders", actions and influences, the relationships between causes and effects are increasingly hard to define and crisis outcomes very hard to predict. What can be observed is, usually, only a mere inconsequential and inconsistent series of events, or symptoms of a more or less underground situation that sickens the environment.

When a crisis response planner is asked to find one or more viable solutions to such complex problems, the way these are framed, understood and, possibly, explained, is paramount, to the point that framing the problem may be seen as more crucial than tackling it quickly! Facing a problem with an over-simplified vision of its defining elements though can be (and usually is) the origin of more and more serious problems in the long term (sometimes, even in the short term). The Roman philosopher and politician Seneca, in his "*de ira*" (on rage), wrote *"...the man who […] wishes to find easy the tasks he approaches, is often disappointed.*" So it is vain, if not dangerous, the common tendency, amongst long course planners, who grew up in a time of "easy" force-on-force scenarios, to dismiss a more analytical and thorough way of approaching intervention planning as "too complex".

The truth of the matter, though, is that the problems we face are ever so complex and hardly definable: so why should the solutions be any easier? And, in fact, they aren't! What we observe is that symptoms of a problem are often separated from the actual problem by time and space. And when we set about solving problems, we realize that complex systems often behave the opposite to human intuition (Forrester, 1968). This means that intervention in complex systems can generate short-term successes but long-term failure (policy-resistance), or the reverse. And History is full of examples of how problems faced with an unsuitable understanding have reacted with behaviors in a direction that was opposite to what was expected.

On the other side of oversimplification, however, sometimes we observe a tendency and a desire (almost an irresistible drive, we daresay), toward super-analytical responses that tend to indulge in the "beauty" of the comprehension, in search of a perfect model, the Holy Grail of modeling and simulation, capable of projecting current events into an ever more accurate vision of the likely outcome of our intervention, all to the detriment of timely actions.

Somewhere in the middle, however, a common ground there must exist, where the need to develop a full scale and time-consuming systemic understanding of the area comes to terms with the pressure to get the action going before is too late. **A "Goldilocks" approach which is just right**: neither too linear and simplistic, which would inevitably

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[1] Extract from an online version of the classical fairy tale by British author and poet Robert Southey, 1837. http://www.dltk-teach.com/rhymes/goldilocks_story.htm.

See also: http://en.wikipedia.org/wiki/The_Story_of_the_Three_Bears

lead to timely, yet ineffective, courses of actions, nor too brain-intensive which would, eventually, produce an accurate and detailed comprehension of a crisis but with a high risk of eroding massively the little precious time available for intervention.

In this work, we will refer to those crises that pertain to the international domain: situations that have a relatively long historical build-up and whose manifest symptoms become a source of concern for the International Community; situations that are characterized by interrelated phenomena of poor governance, widespread and uncontrolled use of violence and, almost inevitably, deteriorating humanitarian conditions. [2]

We will also introduce a proposal for a possible Crisis Archetype, which, in our perspective and experience, can easily be recognized in every Crisis Situation and that can thus be considered in order to gain insights into the Crisis being analyzed.

2. CONTEXT

International crisis situations are, almost self-evidently, complex by nature, and the number of actors involved, the many relations and influences, the freedom of action enjoyed by an ever-growing number of individuals, can be seen as typical attributes of complex social systems. Ignoring such facts, and trying to influence the existing problem conditions with an oversimplified view of their defining elements, could lead to courses of actions that just struggle (at best) to generate the desired results. Many contemporary attempts to intervene in this kind of situations, however, have been affected by the lack of understanding of the many interrelations that influence actors' behaviors and ultimately the final outcome of the crisis situation. In a way, this lack of understanding seems to have added to the overall complexity of the current predicaments, by introducing an element of subjectivity and relativity. As if the total complexity was some combination of two factors: an objective degree of complexity (given, for example, by the number and type of actors and interrelations) and a subjective one, given by the observer's incapacity to understand such complexity due to the inadequacy of the framework of mind and conceptual tool used to interpret the reality. It could very well be that, in the presence of an overly simplistic or linear way of thinking, even relatively simple problems may appear too complex.

But this is hardly the case, since contemporary crisis situations are indeed complex!

These are typically characterized by:

1. extensive violence and loss of life,
2. massive displacements of people,
3. widespread damage to societies and economies,
4. need for large-scale, multi-faceted humanitarian assistance,
5. hindrance or prevention of humanitarian assistance by political and military constraints,
6. significant security risks for humanitarian relief workers in some areas.

But the following is also true: the mental approaches and conceptual tools so far employed have contributed to increase the perception of complexity, by distorting our understanding through the lenses of simplistic thinking.

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[2] The symptoms of a crisis to which we refer in this work are effectively described by the definition of Complex Emergency, agreed by the IASC in 1994: a humanitarian crisis in a country, region or society where there is total or considerable breakdown of authority resulting from internal or external conflict and which requires an international response that goes beyond the mandate or capacity of any single and/or ongoing UN country programme (IASC, December 1994).

In this part of our work we will focus on the nature and some traits of such complexity, trying to identify a possible explanatory system archetype. Later in this paper (chapter 4) we will explore a possible methodology to better understand complex crisis, by showcasing a simplified (and not simplistic!) model in order to map a recent crisis situation (as said in the Introduction, by means of a Goldilocks approach).

The type of crises that we are analyzing, usually develop in social systems which, over a certain amount of time, have evolved towards a system state that, almost like in the case of archetypes' behaviors, can be described by the combined contribution of three macro-variables, included in some self-reinforcing escalatory loops, as described in Figure 1:

- poor governance,
- widespread acts of violence,
- degraded humanitarian conditions.

As we can see, the influences between these macro variables create two major reinforcing loops, one external, clockwise, and another internal, counterclockwise that basically explain how poor governance affects on one hand the diffusion of acts of violence which, in turns, contribute to worsen the humanitarian conditions, which in the end will undermine again proper governance, and on the other how Poor Governance leading to economic crisis drives further
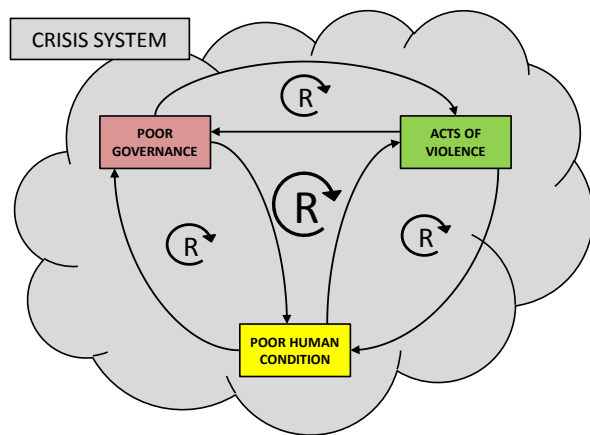

Figure 1: Crisis conditions archetype

down the social aspect which, in turn, exacerbate again the acts of violence that ultimately contribute to deteriorate further the Government Credibility and Stability. What determine these two overall reinforcing loops, is the three sub-loops, also reinforcing, that we can observe exist between each pair of macro variables: in this case we will have that governance will be affected by the diffusion of violence; violence will increase as human conditions deteriorate; and, finally, human conditions will worsen as governance becomes less effective.

Within these macro variables, it is possible to identify some specific variables that, as we will see in the following paragraphs, contribute to define and measure the state of such unstable systems (Fig. 2).

Despite the fact that such dire conditions might exist within a given system, before we can speak of an international crisis, however, a considerable number of players must agree that a threat exist and must be dealt with urgently (Boin et al., 2005). This implies that different actors will recognize a crisis at different time (if ever).
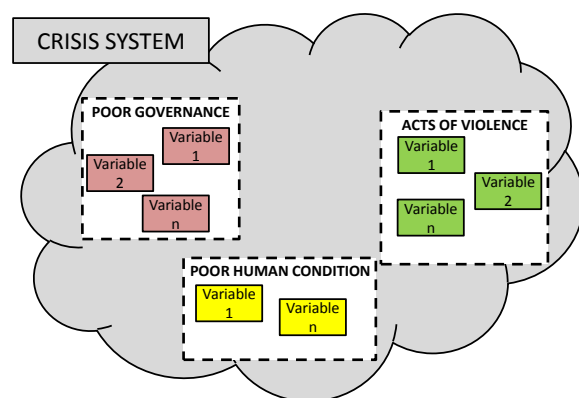
Given the different sensibilities in the judgment by several international players (nation states, organizations,

Figure 2: System's main areas and related variables

alliances, etc.) in ascribing a certain situation to the family of crises, we frequently observe dormant situations that are just let to "ferment" in lack of a wide enough consensus on the fact that something must be done.

Let's take Mali as an example. Since the beginning of 2012, the unresolved question of Tuareg separatism (whose origin dates back as far as 1960, when Mali gained independence from France) had been feeding a violent revolt in the north of the country. After the *coup d'état*, in March 2012, and the consequent Islamist surge, hundreds of thousands of people were displaced internally or across the borders with neighboring states, and episodes of humanitarian violations increased severely. We can be sure that any player from within this scenario would have agreed that there was a crisis. But it was only when the presence of Al Qaeda in the Islamic Maghreb (AQIM) became apparent that the International Community felt threatened and "decided" that in Mali there was a crisis worth of its active involvement.

So crisis are with no doubt complex phenomena, and their complexity, quite intuitively and in a first instance, is a direct consequence of the number of actors and the great variety of behaviors that those actors can resort to, in order to pursue their objectives. In such an intertwined situation, a single actor's behaviors are able to trigger a thick plot of additional effects that directly further contribute to the complexity of the situation, making it very hard to interpret (who is causing what?).

If we were to "open our eyes" and, for the first time, without any prior knowledge of a given situation, we were to make an assessment based on the current view, the complexity of the overall scenario behavior would, indeed, make any interpretation quite a difficult task.

But the type of crises on which we are focusing in this work, does not belong to the family of unpredictable and unforeseeable phenomena (such as natural disasters, extreme weather, etc.). We are in this work mostly concerned with situations that are the **outcome of an escalation**. By that we mean situations that are the

Figure 3: Actors' behaviors

result of some actors' behaviors that, over time, influenced the system conditions in ways that (1) contributed to directly deteriorate the capacity of that system to cope with adversities (to be resilient) and (2) triggered other actor's responses that went in that same direction (thus further deteriorating the system's resiliency).

The perception of the complexity of a crisis is therefore connected to the knowledge of that situation, specifically of the behaviors and conditions that predate the events occurring at the time of our involvement. This aspect is particularly important, since the analysis of current events, usually, distract from the comprehension of pre-existing trends, especially in the case of long ignored chronic situations. Later in this work we will provide an example of generalized global oversights, analyzing the situation in Mali, the latest "surprise" crisis that entered the "window of attention" of the International Community.
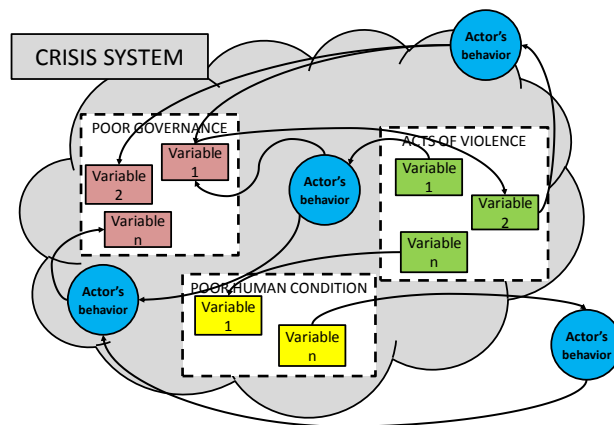
As it appears from Figure 4, crises do escalate as a matter of fact. The window of effective intervention by the International community has two limits. The lower limits is given by the threshold of perception; as said before, this is related to the number of parties that have to recognize the crisis as such, in order for a decision to act to be made. Below this limit, there just isn't enough perception of threat to invest resources in 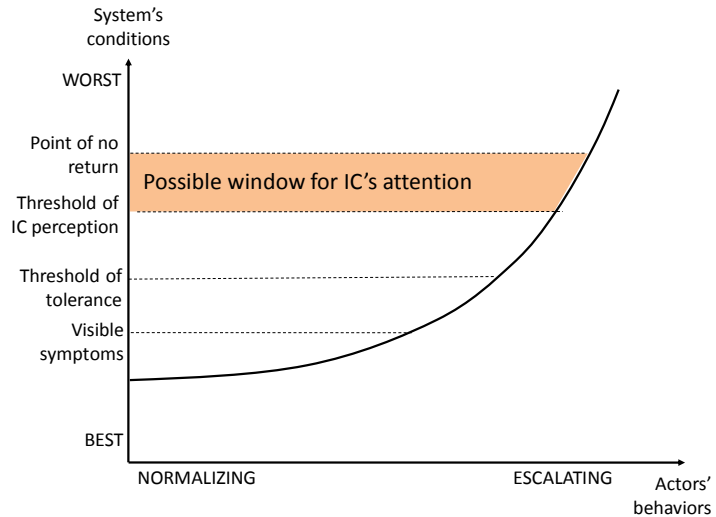dealing with the problem. The upper limit is a figurative one. It just implies that the longer we wait the more difficult the situation will be to understand and the more costly (if at all possible) to solve.

Figure 4: Escalatory character of crises

Because this window of opportunity is quite narrow and, usually, it manifests itself when the situation has already escalated to a level that make life for the involved communities quite unpleasant (refer to the "threshold of tolerance" of Figure 4), the time to develop a thorough comprehension of the area of interest is very short. Furthermore, very little is done by the decision makers ahead of time, to keep up with dormant situations; so when the intervention is decided, most likely, it will also be the first time that a given situation is studied with intent to fix it. This means that the pressure to develop a full scale and time-consuming systemic understanding of the area must be mediated with the need to get the action going before is too late.

To make matters worse, the long escalation time before realizing that something must be done, could very well put us on the "half of the pond" yet to be filled by the proverbial invasive lilies. This means that looking at the curve of the escalatory phenomena that characterize a given situation, if we wait to address it until the curve is very steep, our effective reaction time, and likely effectiveness, will be drastically reduced.

So the need to develop a good-enough model is what led us to the idea of this work. Chapter 4 and 5 will show a "Goldilocks" approach which is "just right" to capture the main interactions in a crisis situation and identify some effective courses of actions in a reasonable amount of time. This is quite away from a computational model to perform scenario analysis and policy modeling. But it aims to be an effective instrument to understand the historical trends and patterns without being distracted by the impetuosity of everyday incidents. It is however a giant leap forward from linear and simplistic thinking as it is capable, as we will show, to grasp the numerous circular interactions that characterize the dynamic behavior of a crisis system.

But before we do that, and in order to better contextualize the field of our analysis and the potential for improvement and innovation of approach, we feel the need to explore some of the literary production that deals with crisis management.

3. A PEEK INTO THE LITERATURE

Much has been written on the subject of crisis. Managing any type crisis start with proper understanding of the elements that define the situation. In addition to the triad of macro-variables that help us "measure" the state of system undergoing a crisis situation (poor governance, violence, human condition) earlier described, a general understanding of what constitutes a crisis is that the following three characteristic elements have to be present:

(1) A threat to one or more important goals of a government,
(2) A short time for decision before the situation is significantly transformed;
(3) The element of surprise, referred to the time of occurrence, due to the inability of predicting certain events (Hermann, 1969; Robinson, 1968).

Many other definitions are available, but they all revolve around the concurrence of the elements of threat, urgency and uncertainty (Boin et al., 2005)

Military doctrine, also, has been evolving in order to incorporate a broader variety of conceptual tools so to better interpret the operations environment that, inevitably, will have to be influenced. This applies both to single state nations and alliances, such as NATO. In the early years 2000, in the UK, the USA and later, in 2005, within NATO, the concept of "**Comprehensive Approach**" has been gradually introduced. What this concept asserts is that complex crisis situations are the consequence of unbalancing factors within the main system domains in which everyday interaction takes place.

These domains are (a) the political, (b) the military, (c) the economical, (d) the social, (e) the infrastructural, and (f) the informational one (usually grouped together and referred to with the acronym PMESII). Conditions in one or more of these domains can be affected (influenced) by the combined employment of the instrument of powers possessed by nation states and alliances. These are: (1) the military, (2) the political, (3) the economical and (4) the civil one (NATO Joint Doctrine, various publications, 2010-2012). The range of instruments of power, which leads to intervention mechanisms, is usually found under a variety of categorizations (with an abundant production of related acronyms!). the Military, Political, Economic, Civil (MPEC) combination of NATO, for instance, becomes the Diplomatic, Information, Military, Economic (DIME) of some nations, or the Diplomatic, Information, Military, Economic, Financial, Intelligence, Law enforcement (DIMEFIL) of some others... and so on. The overall message, regardless of the acronym selection, is that **system states will be affected by the mechanism of intervention**. Proper modeling of these interactions is a key step in designing an intervention, to the point that "*[...]some years from now it may be considered irresponsible and perhaps even criminally negligent to undertake an intervention (or to decide not to intervene) without employing a computational analysis [...] of the effects of candidate intervention*" (Kott et al., 2010).

Crisis management doctrine (military and non-military) over the years, besides growing bigger in size and deeper in the level of comprehension of complex realities, has been capable of generating a number of applications in the field of computational models and simulations. Specific tools have been developed (and are started to being used more and more often) which allow analysis and planning teams to accomplish rigorous analysis of complex international actions by explicit modeling in the following ways:

− First, by structural analysis, the process of decomposing the situation into fundamental components and their interactions, and quantifying the relationship between components;
− Second, by the dynamic analysis of the behavior of the system of interconnected systems, using simulation to gain familiarity, insights, understanding and

knowledge through the interaction between systems; this includes the analysis of the system's sensitivity to key factors;

−   Next, by exploratory analysis of the effects (anticipated and unanticipated) of a range of potential actions (ultimately, policies) by a variety of parties and groups using computational simulations (Kott et al., 2010).

NATO currently uses one of these tools. The software TOPFAS (Tools for Operations Planning Functional Areas Services), is based on three applications: a System Analysis Tool (SAT); an Operational Planning Tool (OPT); and a Campaign Assessment Tool (CAT).

These tools, and specifically the System Analysis Tool, an illustration of which is found in Figure 5, permit the creation of models based on the System Dynamics principles (stocks, flows, feedback loops, etc.). These, all combined, allow the exploration of the complexity of a given situation by identifying those s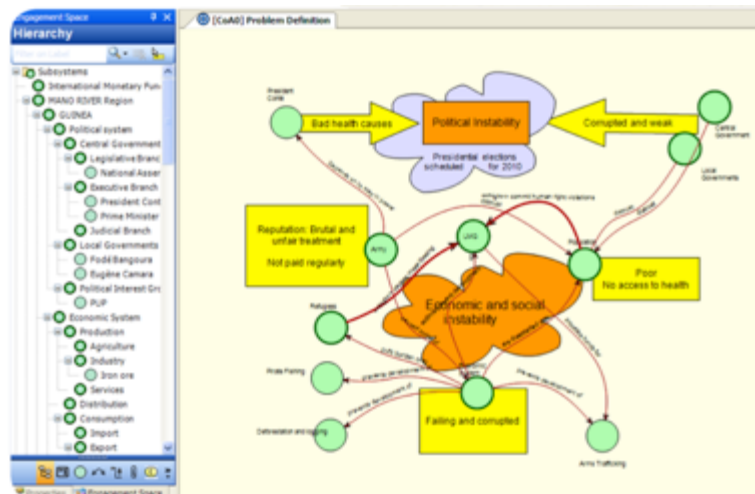ystem states and attributes that will have to be influenced by military and political means (these are the instrument of powers

Figure 5: TOPFAS illustrative snapshot

possessed by NATO as an Alliance) in order to attain the desired end state. This can be rightfully considered a direct application of those computational models extensively described in the book *Estimating Impact,* (Kott and Citrenbaum et al., 2010).

To remain in the field of military doctrine, maybe because the military, more than other political and social bodies, have been called to influence crisis situation in the past few years, we can observe several attempts to describe complex social phenomena and explain the underlying root causes. In the NATO Allied Joint Publication AJP-05, for instance, actors behaviors that contribute to a crisis situations are interpreted in terms of responses to some family of causes, and namely:

(1) **Elemental causes**: fear for own survival, self-interest, ideology and values; momentum for conflict (i.e. culture, political will).

(2) **Structural causes**: illegitimate government, formal/informal leaders, poor governance, lack of political participation, inequality and social exclusion, inequitable access to natural resources.

(3) **Immediate causes**: uncontrolled security sector, weapons proliferation and/or arms race, human rights abuses, destabilizing role of neighboring countries, role of diasporas.

(4) **Triggers**: elections, arrest/assassination of key figure, military *coup d'état*, environmental disaster, increased price/scarcity of basic commodities/goods, economic crisis, massive relocation abroad of financial capitals.

(5) **Crisis-generated causes**: material causes, such as the diffusion of people owning small arms due to the feeling of insecurity; emotional causes, like in those typical cases of escalatory violence fed by the loop of hate and revenge.

However, this simplified causal relationship between system conditions classes and actors' behaviors does not replace proper modeling of social systems. It serves rather as a basis to build a systemic view of an area of interest, as we will see in the next chapter.

4. BUILDING A "GOOD-ENOUGH" MODEL OF A COMPLEX CRISIS

The overall aim of this work, and of this chapter in particular, is not to propose an alternative and more "digestible" method to modeling than that of techniques based on computational models that explore the political, military, economic, social, information, and infrastructure (PMESII) states of systems under the effects of diplomatic, information, military and economic (DIME) actions on those systems (Kott et al., 2010).

Rather, we intend to focus on the comprehension of a crisis in terms of the undergoing dynamics that are the results of long overlooked trends and interactions. This is a necessary step if one is to make sense of current events and situations. Otherwise, given that our involvement in a crisis generally happens when the system has reacted with diverging and disorienting behaviors, characterized by disrupting events and large scale phenomena, we can easily be distracted by everyday incidents (we could call it "news headline modeling") and miss the underlying causes. For this reason, there is little or no mention in our work about instruments of power and/or mechanism of intervention, simply because we are aiming at describing a situation for what it is (AS IS), before any intervention efforts take place (so before the implementation of intervention policies).

One of the main drivers of the approach we are about to illustrate is the need to come to an **adequate understanding of a situation within a reasonable amount of time**. To this aim the steps are deliberately simplified with respect to the procedure we would normally use to create a full-scale model. This process could be useful when the need to develop a thorough assessment of the impact of intended interventions in a crisis situation, must be mediated with the urgency (one of the defining elements of any crisis) of making proper sense of the situation. Sense making is the first step in the process of crisis management: as an example, if we see a crisis as the outbreak of a disease, getting to a reliable diagnosis before prescribing any cure is of crucial importance (Boin et al., 2005). But a perfect diagnosis performed too late is of no use!

Hence the need for a **fast-enough approach** to get to a **good-enough understanding** that will, in turn, allow for an **effective-enough intervention**. An intervention based on good-enough comprehension, can be adjusted for unforeseen trends and events with relative ease. Because it is based on a reliable comprehension of the main dynamics of the situation, more effective courses of actions could be developed by increasing the granularity of the analysis at a later stage. It could be seen as refurbishing a house that rests on solid foundations: there is some work to be done, but we don't have to demolish and rebuild it. Conversely, if we give ourselves an unrealistic large amount of time to develop the highest degree of comprehension and the best set of intervention measures, the risk of "performing surgery on an already dead patient" increases drastically.

The process we are about to introduce is based on a few clear steps that progressively allow building a good-enough, just-right "Goldilocks" model and, consequently, improving situation awareness. The end product of the knowledge that we acquire throughout the application of this process, is a qualitative causal loop diagram that schematically represent the relationships among the various parts of the "crisis system" and that are ultimately able to infer (by recognizing systems archetypes) the main dynamics that determine the systemic behaviors at the origin of a crisis.

Here are the steps that we envision for the analysis methodology we propose:

Step 0 – Analyze the context
Of course all of the following analysis steps assume a certain value if set in the related context, which thus has to be also thoroughly analyzed. This step basically deals with acquiring some basic information on the theater of the crisis (geographical, economic, demographic, etc.)

Step 1 – Define the main actors and their interests, motivations, capabilities and objectives.
When we talk of an actor in the international system, we usually refer to an entity (nation state, organization, group, and individual) which "[...] has its own interests and acts in pursuit of those interests in accordance with its capabilities and motivation. These actors can be viewed as systems, comprised of different elements that interact in accordance with their attributes with other systems to influence their behavior in pursuit of their interests. Their actions will also create effects that may have other consequences" (NATO, ACO COPD, 2010). Starting from this operational definition, we can offer a systemic view of the defining elements of an actor.
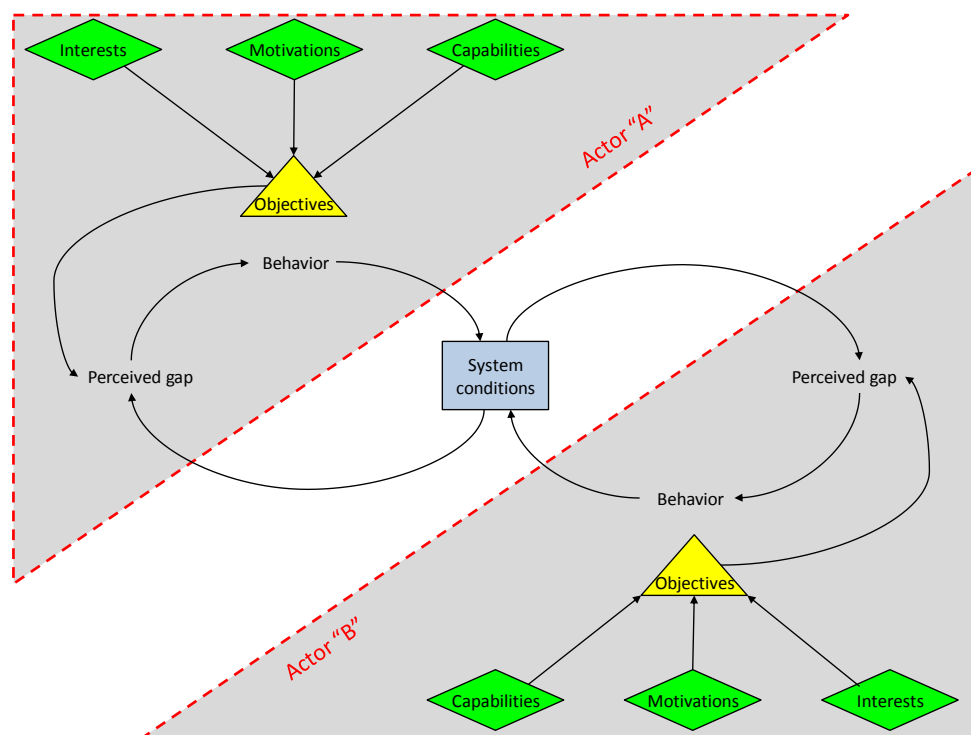

Figure 6: Effects of actors' interests, motivations, capabilities and objectives on a system

As we can see in Figure 6, any actor in the international system (the overall grey triangles in the illustration) acts, opting for a specific behavior, in response to an existing gap between some system conditions and a desired target value (defined as an objective) for those conditions. The objective is in turn, set accordingly to some underlying interests and motivations, supported by some capabilities.

When studying actors' actions and interrelations, we usually start from observed behaviors (an attack, a suicidal bombing, deployment of forces, a key leader's TV address, the pursuit of nuclear capability, etc.). If we stop at this, without exploring the underlying material, we would only unveil the **reactive** nature of those behavior, missing partially the point and missing, most of all, the root causes of those behaviors.

Delving into the details of the elements defining an **objective**:

Interests usually represent legitimate ambitions (from an actor's point of view, of course) to achieve a degree of sustainment and preconditions for one's improvement (access to resources, protection of commercial routes, security of own borders, etc.).

Motivations, differently from interests, are related to the needs in the "*maslowian*" sense, meaning that conditions of particular need (especially the needs at the bottom of the pyramid), will orient and motivate individual and collective behavior.

Capabilities are those means through which an actor can realistically pursue his objectives. Military capabilities are of primary importance, but also important are diplomatic capabilities, economical instruments, infrastructures, etc.

All of the above are the main drivers that ultimately support setting an actor's specific objectives:

Objectives, as briefly described above, are target values of some specific system conditions that one actor wants them to assume, to which aim it will employ a selection of the possessed capabilities (more secure borders, independence of an ethnic minority, control over separatist group, the eradication of drugs production, etc.).

Step 2 – Analyze the history of a crisis
Simply put, this requires studying the sequence of events that have led to the crisis and its actual context. A timeline of events is usually a good starting point for this task. Throughout the long escalating series of circumstances that characterize a crisis, one should be able to identify moments in which an actor's situation in the system has shifted from a perceived advantage or neutral outcome to one of marked disadvantage. These are usually the moments in which the dominating dynamics show themselves in full brightness. Take the classical "arms' race": when an actor has increased his arsenal, the opponent perception of the system shifts from a position of advantage to one of disadvantage. At this point it is possible to observe a behavioral change (and that is the dynamic aspect of the matter) as the actor now on the "losing side" proceeds to increase its military arsenals. To retrace all such pivotal moments in the history of a crisis, should provide with vital insights into the main influences that orient the behaviors, thus contributing to the creation of an influence diagram that will enhance the comprehension of the crisis.

Step 3 – Explore conditions of perceived threat.
While tracing back the historical phenomena that have led up to today's crisis, it is quite common to identify some situations that, in an intuitive way, can be considered responsible for having determined or heavily influenced some actor's response. These can be referred (and usually are) as causes, but when we place them within the loop of causality to which they belong, we have to abandon this "common folks" simplification and consider them as elements of "perceived threat" (relative to one actor) that are, at the same time, cause and consequence of behaviors and other events. It is undeniable, though, that if we were to create a hierarchy of such situations of threat, we would eventually come to some base line situation whose causes are "out of the loop" (or can be conveniently placed there, by defining the boundary of our model) and that, therefore, can be assumed as "elemental". In the following, we propose a hierarchical list of these "perceived threat conditions", as found in literature (NATO AJP-05, 2012) and arranged to serve the purposes of our model.

- *Elemental conditions*
  These have been defined as conditions of "fear for own survival", threatened self-interest, and challenges to ideology and values. If we start from here, we can easily see that any actor's natural right to survive and prosper could be a very powerful motivating cause to trigger active (and even violent) behaviors. Likewise, in societies were feelings of religious identity are very strong, if those were under

attack, this could also lead to extreme behaviors (holy war, martyrdom, etc.). these conditions are defined "elemental" because *they refer to the founding element of an actor's identity*; to generalize, we could assert that elemental conditions of a crisis are those perceived threats to an actor's deepest interests and motivations.

- *Structural conditions*
Next in line are structural conditions, a set of conditions that are the result of the inefficacy (or, in the extreme cases, the collapse) of the structures that communities of individuals resort to in order to protect their interests and nurture their ambitions. Political systems, societal organization, state boundaries, etc. are all elements that mankind has created to have a better chance of prospering, within his reference community. When such structures start losing their purpose of existence (think of unsupported government, formal/informal leaders, poor governance, lack of political participation, inequality and social exclusion), then societies (and the individuals that belong to them) will resort to new behaviors in order to pursue their own interests and needs.

- *Immediate (proximate) conditions*
Proximate conditions may contribute directly to a crisis, or provide the bedrock for more deep-seated, but less immediate concern. Such phenomena as uncontrolled security sector, presence of militias, and even Private Military Companies (PMC) operating initially in support of ineffective State security forces, may disseminate a climate of terror and insecurity. Often enough, when a state starts losing its grip over the armed forces, we observe light weapons proliferation. Unguarded arsenals become the easy target of desperate people in search of protection. This usually exacerbates instability.
Next, in the family of proximate conditions, we have human rights abuses. Inhumane methods used to counter an internal crisis may result in the gradual alienation of an entire population (or of discrete groups within it). Neighboring countries may attempt to influence the outcome of a crisis by supporting specific groups within an unstable or potentially unstable state.
Last in our list of proximate conditions, we observe that, whenever violence start spreading, people start fleeing their homes. Once displaced, either internally or across the borders, concentrations of people in distress will become an instrument in the hand of the ill-intentioned. Camps are usually a great pool of recruitment, easily achieved by leveraging on the dire conditions of the refugees. Refugee camps can also be used as concealment sites to rest and regroup before the next terroristic attack. Finally, and no least importantly, these sites can be the object of deliberate attacks as part of well-planned terror campaigns.

- *Trigger conditions*
Triggers are actions or events (or their anticipation), that, in an accessory role and in conjunction with pre-existing conditions, may set-off or escalate violence, and/or accelerate the degeneration of governance and/or the worsening of humanitarian conditions. Examples are:
  o elections;
  o arrest-assassination of key figures;
  o environmental disasters;
  o military *coups*;
  o increased prices or scarcity of basic commodities;
  o economic crisis, rapid increase in unemployment or collapse of a local currency.

- *Crisis-induced conditions*
  - **Material conditions**. Conflicts inherently increase the supply and circulation of weapons, which inevitably spread from those actors involved in the initial crisis to others, allowing them to pursue their own agendas; other weapons may fall into the hands of criminal actors. A "war economy", with funds from backers and potentially foreign aid, may benefit from some actors to the point that they are materially better-off during a crisis than without one.

  - **Emotional conditions**. A culture of violence can emerge, or the success of certain actors in achieving their aims may create new enemies, or inspire previously dormant actors to take up arms. In some cultures there is a tradition of revenge; conflict, even if resolved at a higher level, may leave some individuals or groups dissatisfied and liable to re-ignite violence.
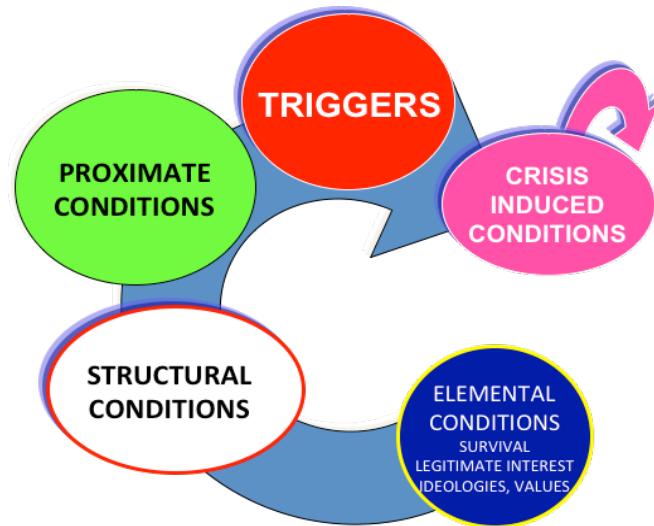

Figure 7: Conditions of threat within a crisis system

Step 4 – Identify and select the "problem-defining" stock variables.
At this point of our analysis we should have developed a wide enough encyclopedic knowledge of the area of interests. Through the careful revision of actor's behavior and the underlying interests and motivations, and, most of all, thanks to the knowledge of conditions that threaten the balance in the perception of advantage and disadvantage, we should be able to identify and select some variables that define (and therefore, measure) the problem situation. Having already introduced three macro areas common to most (if not all) crisis situations, it is within these sectors (**governance, violence and humanitarian condition,** as seen in paragraph 2) that we should look for a selection of problem-defining variables. A sample list (far from being exhaustive) of potential variables is provided in the following.

- **Governance**:

  - Government credibility;
  - Level of economic development;
  - Political fragmentation;
  - Popular consensus toward government;
  - Level of operational capability of armed forces;
  - Open grievances, etc.

- **Violence**:

  - Motivation to rebellion;
  - Level of activity/effectiveness of insurgency cells;
  - Economic support to insurgents;
  - Level of diffusion of small arms;
  - Number of armed gangs;

o Number of inter-tribal conflicts, etc.
- **Humanitarian condition**:
  o Number of people in precarious conditions;
  o Quantity of humanitarian aid;
  o Extension of aid network (reach capability);
  o Quantity of available food supply;
  o Quantity and ease of access to water sources, etc.

Far from being complete, this list should be a starting point to explore the specificity of any particular crisis situation.

Step 5 – Build-up a causal loop diagram
At this stage in an analysis, we should have put together everything we need to build a causal loop diagram.
From the identified variables, and bearing in mind the basic dynamics already identified in step 2, as well as linking actor's behaviors to the influenced/influencing conditions, it should be possible to recreate a systemic view of the area of interest. Describing this step would probably require more words than the limits of our paper would recommend. So, to complete the picture, we will perform this last step (together with all the other precursory steps here described) in the context of a real-life example: the crisis in Mali.

5. A PRACTICAL CASE: "THE CRISIS IN MALI"

We will now show the application of our proposed analysis methodology, as well as the identification of the proposed Crisis Archetype, as described in the previous sections, to a quite actual international situation, the Crisis in Mali, described as it was in last January 2013. Let's thus start by applying our proposed methodology step by step.

Step 0: Analyse the context.
Mali is a big country, which is partly sub-Saharan (like Senegal, Burkina Faso, Ghana, Nigeria) and partly Saharan (as Mauritania, Algeria, etc.), has a surface roughly equivalent to 4 times the one of Italy (1.240.192 squared Km). It has a population of more than 15 millions inhabitants divided into a plethora of ethnic groups and religions. A full set of context information is reported in Table 1, below.

Population	>15 milions
Religions	90% Muslims, 9% Animists, 1% Christians
Ethnic groups	Mande 50%, Peul 17%, Voltaic 12%, Songhai 6%, Tuareg and Moor 10%, other 5%
GDP (PPP)	$ 18 billion
GDP (per capita)	$ 1.100
Export ($2,3 billion 2011 est.)	Cotton, gold, livestock
Import ($2.5 billion 2011 est.)	Oil, machinery, building materials, food, textiles
Population growth rate	2.6% (doubling time of about 30 years)
Fertility rate	6,35 children per woman
Average age	16,3 years

Unemployment rate	over 30% (with worsening projections)
% of population below poverty threshold	47% (2006 UN est.)
Children malnourished (< 5 years)	28%
Infant mortality (< 5 years)	17,8%

Table 1: Demographic data and economic situation in Mali

It is interesting to observe some of the data reported in Table 1, specifically the population growth rate of 2.6%, despite the fact that the average fertility rate is quite high (more than 6 children per woman), but this is contrasted by the infant mortality rate which is also quite high (17.8% below the age of 5). This brings forward a first clear aspect of a population, which is, for a half, living under a poverty threshold, not very well fed and displaying high unemployment rates.

As far as the economy goes, the south of the country, specifically along the river Niger, sees the main agricultural areas. Although potentially capable of being self sufficient in food production, the unpredictability of good seasons (mostly related to non-disruptive flooding of the river Niger) make Mali a net importer of food and other agricultural products. Also in the south are some important gold and uranium deposits (average gold production oscillates between 42 to 50 metric tonnes per year, while Uranium potential in the Falea region is thought to be 5000 tonnes). The north of the country, due to its barren regions, is mostly non arable and local communities (mostly Tuareg) practice sheep and goat farming. Worth mentioning is the fact that there are some confirmed but yet non exploited oil and gas resources in the north of the country.

Step 1 – Define the main actors and their interests, motivations, capabilities and objectives.

In the context described in Step 0, we can now focus on the various acting and interacting subjects. In particular, we can see from Figure 8 how Mali lies between the influence of Saharan countries (Algeria and Mauritania) and some West African States, most of which belong to the Economic Community Of West African States (ECOWAS). In Figure 8 are also depicted the other actors (state and non-state) involved in the crisis.
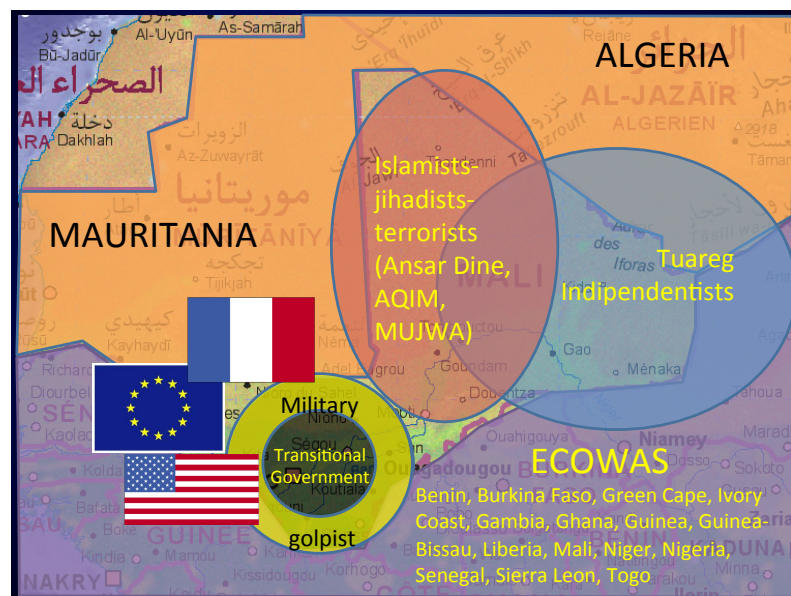

Figure 8: Overview of the main actors in the Mali crisis

Among the main actors we can thus identify the ones reported in the following Table 2, together with their Objectives, Interests, Motivations and Capabilities:

ACTOR	OBJECTIVES	INTERESTS	MOTIVATIONS	CAPABILITIES
Transitional Government	Contain the impact of the Islamic advancement Solve the Tuareg Separatists issue	access the precious resources (Natural gas, Oil) in the north of the country	Maintain integrity and control of the sovereign territory,	Armed Forces of very limited effectiveness, scarce international credibility, political mechanisms ineffective (presence of patronage and corruption), high influence of the military representatives
Military Golpists	Get rid of the corrupted and ineffective actual political class	Not very clear and quite fragmented, the *coup d'état* stemmed from a mutiny	National pride driving indignation for the situation	Many were trained in the US, but as a matter of fact, they have a very limited effectiveness.
Tuareg Separatists - Mouvement National de Liberation de l'Azawad (MNLA)	Achieve Independence from South Mali due to deep differences between ethnicities and, recently, push-back the Islamic expansion	control of the resources in the North of the country	recognition of an autonomous Tuareg nation,	Initially supported by many of former combatants from the Libyan Militia (who were also providing weapons). Initially allied with Islamic groups, they are actually not very influent and oppose the very same Islamic groups that, after a while, superseded them
Islamists Groups/Movements (Ansar Dine, AQIM, MUJWA)	To gain and maintain control of the north Mali territory To create an Islamic state, ruled in accordance with the *sharia* MUJWA: limit the effectiveness of the Tuareg separatists (MNLA)	Get hold and maintain *safe havens* for the trans-national terrorism Control of drug and human trafficking	Non-homogeneous among the various groups. Religious identity Jihad Fundamentalism	AQIM is very well equipped and extremely wealthy Many Ansar Dine militants are Tuareg belonging to the former Libyan militia
Neighboring Countries (ECOWAS + Algeria / Mauritania)	Uncover and negate terrorists' *safe havens* Defeat ethnic insurgency Deny freedom of movement of terrorist cells	Contain the separatist threat Contain the terroristic threat Maintain stability in the area	Non homogeneous Preserve own integrity and identity	Capabilities vary from state to state In general there are concerns within the IC about the overall capabilities possessed by the neighboring states Main shortfalls deals with the Counter-insurgency operations in arid and desert environment
USA	Eliminations of terroristic *safe havens*	Contain the terroristic threat Maintain stability in the area	Global war on terror	US have been supporting Mali and other states with Military assistance missions (suspended after the coup, in accordance with congress law)
FRANCE (and EU) (before Military Intervention)	Same as USA, plus: Security of key infrastructure run by European firms	Same as USA, plus: Preserve their area of influence Access to the region resources	Feeling responsible for the ex-colony	Active diplomacy Economic influence

Table 2: Actors' characteristics

Step 2 – Analyze the history of a crisis.

Let's now have a look at the timeline of circumstances over which the Crisis in Mali has developed so far, in terms of the history of the conflicts that happened over time, geo-strategic aspects, physical environment, population, culture, religion, media, etc.

The last ten years are those probably worth of some deeper insights in order to understand the latest developments. In 2002, the United States started the so called *Pan-Sahel Initiative* (PSI) in Mali, Niger, Chad and Mauritania, to strengthen their borders in order to control illegal arms and drugs
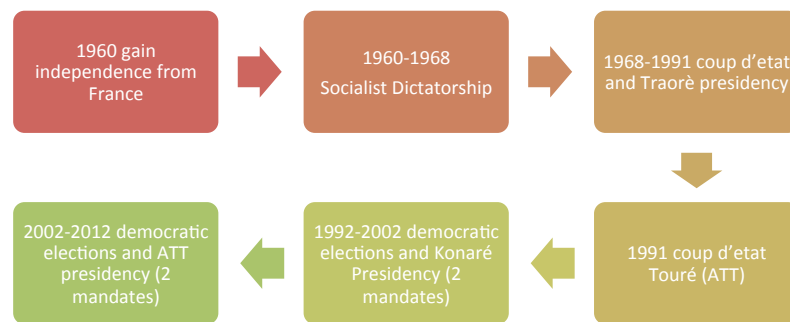
Figure 9: Post-colonial historical background

smuggling, as well as the circulation of transnational terrorists (from 2004, PSI became the *Trans-Sahara Counterterrorism Partnership*). The initiative was primarily based on military support (in terms of training and equipment).

Always in 2002, following democratic elections, Amadou Toumani Touré (ATT) was elected President and stayed in charge for two mandates, during which he basically introduced/caused a policy of consensus, based on the absence of an ideological or party platform and a continuous search for cooperation and consensus. Far from reaping long term benefits, this general aptitude has fostered into a great sense of laxness and created the fertile ground for corruption, patronage and collusion. On top of this, Tourè policies have been characterized by a scarce attention for the "northern" matter.

Towards the end of the 2ⁿᵈ mandate, uncertainties rose concerning likely successors, as well as suspects on a secret ATT project aiming at declaring an emergency state due to the northern issues and thus extending the actual mandate (which would have been a deliberate act against the constitution of Mali).

As said, in the meanwhile, the Tuareg question in the north was growing. Tuareg are a semi-nomad ethnic minority that has historically been orbiting in the territory of the Saharan countries (North Mali, Niger, Burkina Faso, Algeria, Libya, Morocco) and that has also historically been claiming sovereignty over the territories traditionally occupied (Azawad), even by recurring armed rebellions against Mali and Niger Governments (endowed, at times, also with "*pan-Tuaregism*") and following the lack of effective inclusive policies from the Mali Government during the 90-ies and in the years from 2006 to 2009. Recently, there have also been several recriminations on abandonments and discrimination from the central government.

In March 2012, a new *coup d'état* under the guidance of Cpt. Amadou Sanogo took place. Silently cultivated under the ATT democratic journey, the golpe was apparently driven in response to the suspects of a possible drift of ATT towards tyranny, as well as to the really bad management of the Tuareg rebellion. However, it turned out to be as slightly more than a mutiny (there was a scarce organization) and its immediate side-effects amplified the social crisis and ultimately provided the rebels with a further advantage. Even if it was officially dismissed on April 6ᵗʰ 2012, the military council still "influences" the political life of the country. The latter, in the meanwhile, had undergone a heavy Islamization so far. In fact, the initial support to the Tuareg revolt from indigenous Islamic forces (Ansar Dine) then developed into an opening towards

international jihadist forces to enter north Mali under the invitation and support of local Islamists. This turned out for AQIM as a rich opportunity to gain control over a huge area filled with airports, military bases, ammunition warehouses and training camps. Additionally, AQIM was able to get into possession of valuable military equipment that was previously given to the Mali Armed Forces as part of the military aid program and that was abandoned by the withdrawing governmental forces.

Step 3 – Explore conditions of perceived threat.
Let's now explore what are the perceived threats in the context and circumstances described so far and in line with the hierarchy introduced in paragraph 4. We have already been discussing about the rationale for this step in par. 4 so we will just list now what are the items in each class (see also fig. 7) In particular, the main items in each class, are:

- **Elemental conditions** (i.e.: survival, deep legitimate interests, ideologies, values, etc…):
    - *Tuareg ethnical identity*
    - *Islamic Fundamentalism*
- **Structural conditions** (i.e.: illegitimate governments, ineffective governance, inequalities, forbidden access to the political life, social exclusion, access to natural resources, geographical issues / borders, etc.)
    - *Post-colonial borders*
    - *Corruption, Patronage, Mafia-like relationships*
    - *Perception of abandonment and discriminations*
    - *Access to (presumed) mineral deposits*
- **Immediate (proximate) conditions** (i.e.: INTERNAL: Security-sector out of control, proliferation in personal arms possession, human rights abuses, flows of displaced persons and refugees; EXTERNAL: bad neighbours, geopolitical competition, refugees and runaways, terrorists)
    - *Impact of the Arabic Spring and the Crisis in Libya (militias returning, arms diffusing after October 2011)*
    - *More than 200k IDP's and 250k refugees in neighbouring countries (Jan.'13), with UNHCR forecasting other 700k in the near future.*
    - *AQIM contamination*
    - *Numerous violations of human rights (especially on women and children)*
- **Trigger conditions** (events generally triggering and/or accelerating a violence escalation, i.e.: elections, arrests or assassinations of key people, environmental disasters, primary goods prices increase, coup d'état, economical crisis, etc.)
    - *Rearing of food price*
    - *Coup d'état*
    - *Alert for locusts invasion*
- **Crisis-induced conditions**
    - **Material**: *light arms proliferation*
    - **Emotional**: *hates, revenges (i.e.: recent outcrop of numerous inter-tribal conflicts in North Mali)*

Step 4 – Identify and select the "problem-defining" stock variables.
As reported in the previous paragraph 4, the three main areas of interests for identification of the state variables affecting the system main behavior are: **Governance, Violence** and **Humanitarian Condition**.

These are the variables that we have identified in each area (see also Figure 10):

- **Governance** (orange background, in fig. 10):
    - State Credibility and Political Stability
    - Economic Welfare
    - Operational Capability of Armed Forces

- **Violence** (green background, in fig. 10):
    - Separatists cause;
    - Jihad and Terror Causes
    - Islamized Territory

- **Humanitarian condition** (light blue background, in fig. 10):
    - IDP's and Refugees (IDP = Internally Displaced Persons)
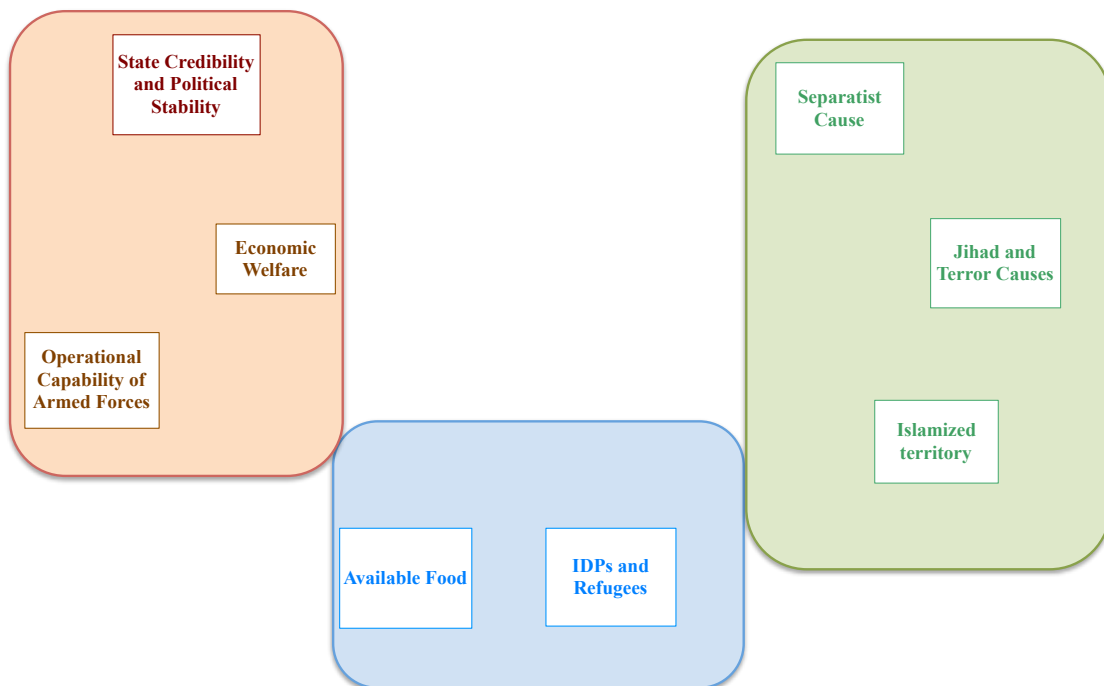   - Available Food

Figure 10: Main state variables of the Mali crisis

Following the analysis carried out in the steps described above, we are now ready to introduce Step 5 which is related to the development of the cause-effect relationships among the various items evidenced so far, in other words our causal-loop diagram (CLD). For design of layout and space-saving purposes, the variables depicted in Figure 10 will be slightly reduced in dimension, so to allow space for other variables and the various links.

Step 5 – Build-up a causal loop diagram

Let's start by analyzing the relationships between probably the two main issues that Mali has historically been facing, at least in the last 20 years, and namely the relationships between Poor Governance and the unsolved Tuareg Separatist Cause.
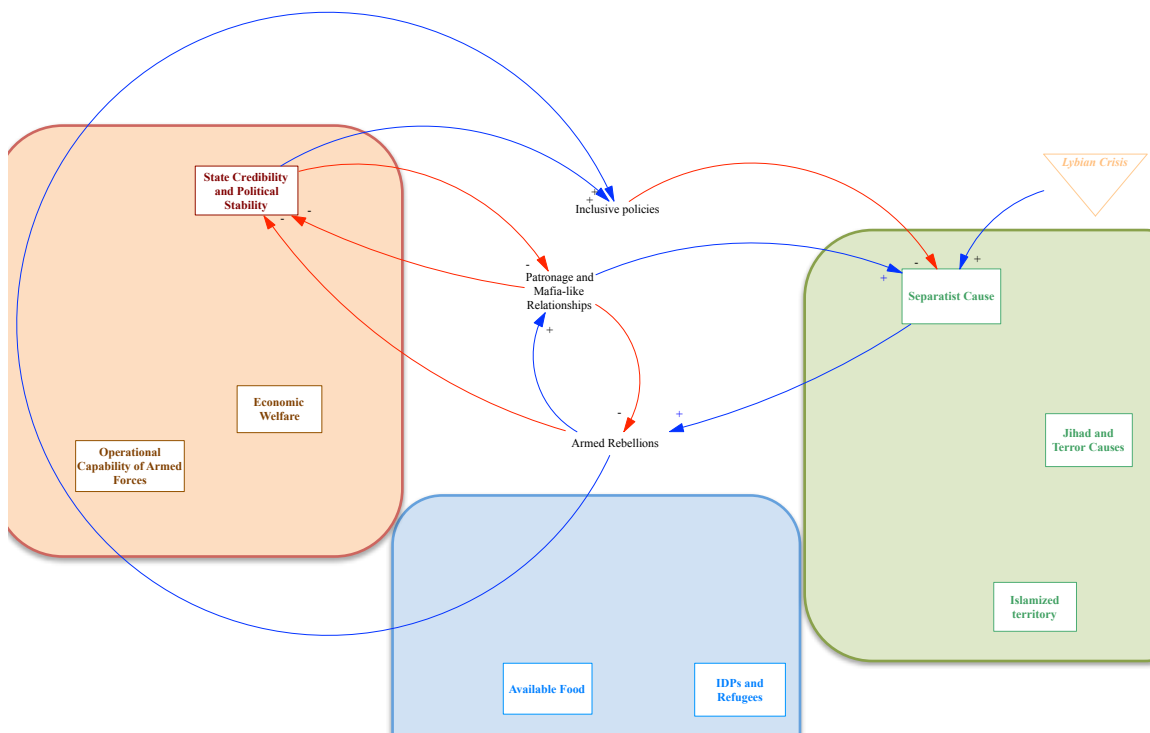
Figure 11: Poor Governance vs. Separatists Cause /1

As depicted in fig. 11, we can see that if the "*State Credibility and Political Stability*" deteriorate, this brings to the fact that the government does not perceive the need to resort to inclusive policies to face existing problems (first and foremost that of separatism). In lack of policies capable of fostering more inclusion and dealing effectively with some of the issues raised by the Tuareg minority, consequently, the "*Separatist Cause*" tends to increase and we have also represented how it has also been further reinforced by the Libyan Crisis at a certain point in time (mostly through the "injection" within the Mail system of a great number of Tuareg fighters formerly belonging to Gadhafi's militias, as well as a large amount of weapons). As the Separatist Cause increases, also Armed rebellions increase, which in turn should on one hand further deteriorate the credibility and stability of the government, while on the other should increase the perception of the need to promote inclusive policies (the wider positive link on the left of the CLD in fig. 11). As the state starts being mined in its roots (credibility and stability), the government is encouraged to lean on local warlords to maintain stability, through Patronage and/or Mafia-like relationships (corruption, in other words), which on one hand tend to decrease the use of force but on the other feeds the Separatist Cause itself. For clarity's sake, we have showed the relationship between armed rebellions and inclusive policies as in fig. 11 but for the rest of our analysis, we will use the layout/organization shown in fig. 12 (where the same relationships "cuts through" the CLD more directly…).
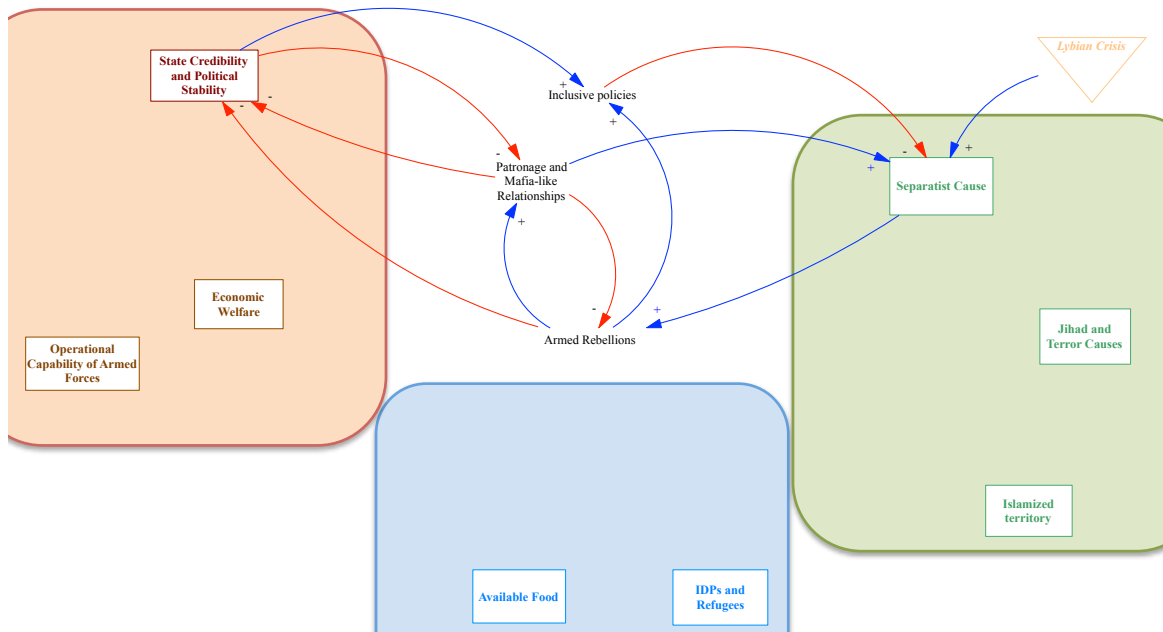
Figure 12: Poor Governance vs. Separatists Cause /2

If we still keep our focus on the "*State Credibility*", on the other hand we can see (fig. 13) how it positively influences the "*Economic Welfare*" (clearly ingenerating a positive reinforcing loop), and gets in turn improved by the effectiveness of the "*Operational Capability of Armed Forces*". The latter, clearly counters the effects of Armed Rebellions, which, on the contrary tend to bring down the Economic Welfare. It is interesting to notice that generally, as the Armed Forces tend to lose their effectiveness and operational capability (due to some inherent structural deficiencies and in response to the crumbling of the State Credibility), this generally brings the higher Military ranks to trying to compensate the declining effectiveness by starting to influence directly the political life, further mining the government stability and credibility in the eyes of the national and international communities. It was along this escalatory loop that, in March 2012, some middle ranked officers, led by Capt. Sanogo, an American trained Army officer, successfully toppled the government in charge and established a military junta. It is for the same dynamics that, even well after stepping down from power in April 2012, Capt. Sanogo and his loyal few continue to wield significant influence over the ruling government[3].

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[3] This was starkly illustrated on December 11, 2012, when interim Prime Minister Cheick Modibo Diarra resigned after Sanogo ordered his arrest. Sanogo accused Diarra of obstructing the workings of the interim government in the service of his own political ambitions. Some observers speculated that Diarra's support for a regional military intervention, which was reportedly opposed by Sanogo and some other members of the military, played a part as well. Many analysts agree that Diarra was playing an obstructive role, but note that Sanogo's actions bode ill for efforts to distance the military from politics.
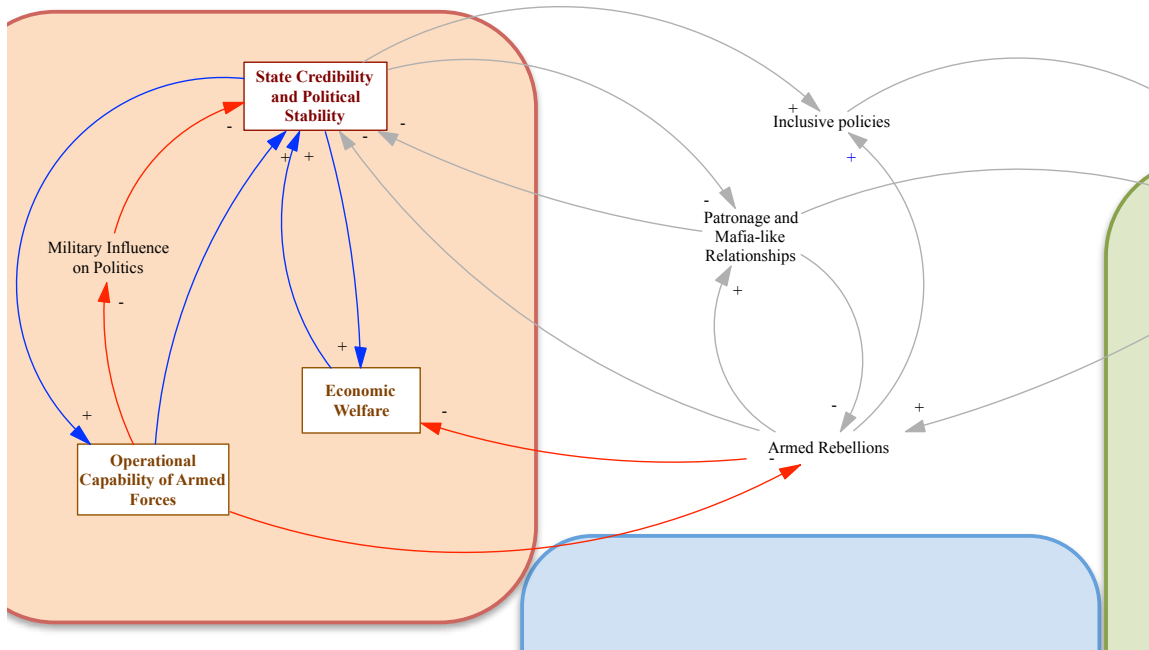
Figure 13: Relationships between Governmental aspects

Let's now have a look at the Violence sector (green background). As we have seen in our previous analysis, under a timeline perspective, on one hand the Libyan Crisis has provided combatants and weapons to the Separatist Cause, as well as it has started introducing some Jihadists in Northern Mali. The Tuareg, seeing an opportunity in joining their forces with the Jihadists due to their excellent organization and combat abilities, have basically opened the doors of North Mali to these groups (who, given their excellent strategic guidance and perspectives, have started to become pervasive in North Mali, even by organizing marriages with the local people) which, after a while, have basically started to pursue their own Terror Causes, shifting the main focus from the separatist cause, or even by openly contrasting such movement as a disturbance to the Jihad objectives.

We have represented this in the CLD in Figure 14 with a positive feedback from the "*Separatists Cause*" to the "*Jihad and Terror Cause*" and with a negative link from the latter to the former one, meaning that as the Jihad cause increases, the Separatist Cause increases less (thus as if the Jihad Cause is acting over a sort of additional outflow from the Separatist Cause – it is however clear that the negative link is basically representing an historical situation, and if we should pass to a quantitative description of the model, this part ought to be slightly revised in order to become consistent with the actual dynamics). Additionally, as the Jihad cause increases, this brings to more armed rebellions (feeding back to the Poor Governance Sector) as well as to a wider Islamized territory and international terroristic acts (here seen as an output).

With reference to the Crisis Archetype introduced back in Figure 1, we have seen so far how the first two areas interact together. We will now introduce the third area of Humanitarian Condition, thus linking together the three areas and generating the wider positive feedback loops (see fig. 1)

Let's now see what happens in the Humanitarian Conditions Sector. As described in Step 4, we have identified as the two main variables for the Humanitarian Sector the "*Available Food*", the number of "*IDP's and Refugees*" and "*Quality of Life*". Starting from the Islamized Territory, we can see from data that this generally brings to several humanitarian violations, which, in turn, cause several people to flee their homes and territories to reach some safer location within or outside of their own country.
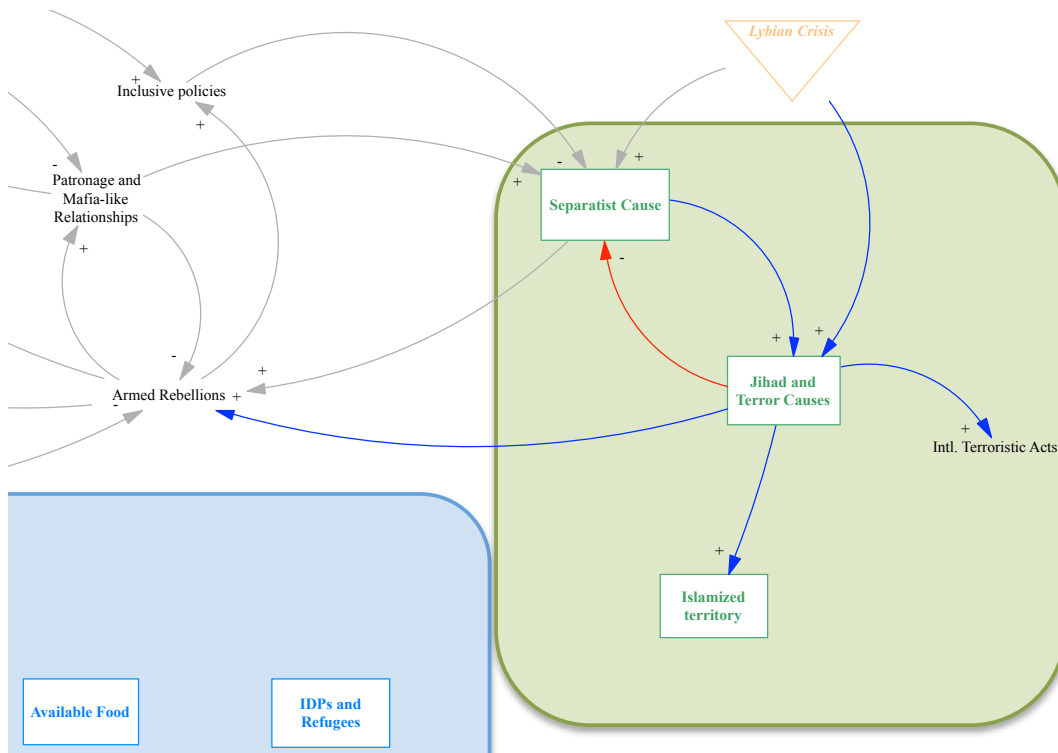
Figure 14: the effects of Jihadists entering the country

We can thus understand how, from the North, a lot of people have fled to the south in search of a safer place thus contributing, given the already critical economic conditions to further degrade the overall Quality of Life. Also, *Armed Rebellions* generally decrease the accessibility to food and this contributes to further lower the quality of life in the country. A poorer quality of life, on the other hand, easily tends to generate frustration and despair into people who then can be even more easily prey of the aims of the Jihadists ("*AQIM Hiring*"), who can thus increase their lines quickly (this closes the loop between the Violence Sector and the Humanitarian Sector). Also, a poor quality of life does not contribute to a State's credibility, thus further deteriorating its stability (this closes the loop with the Poor Governance sector). The final CLD is depicted in fig. 16.
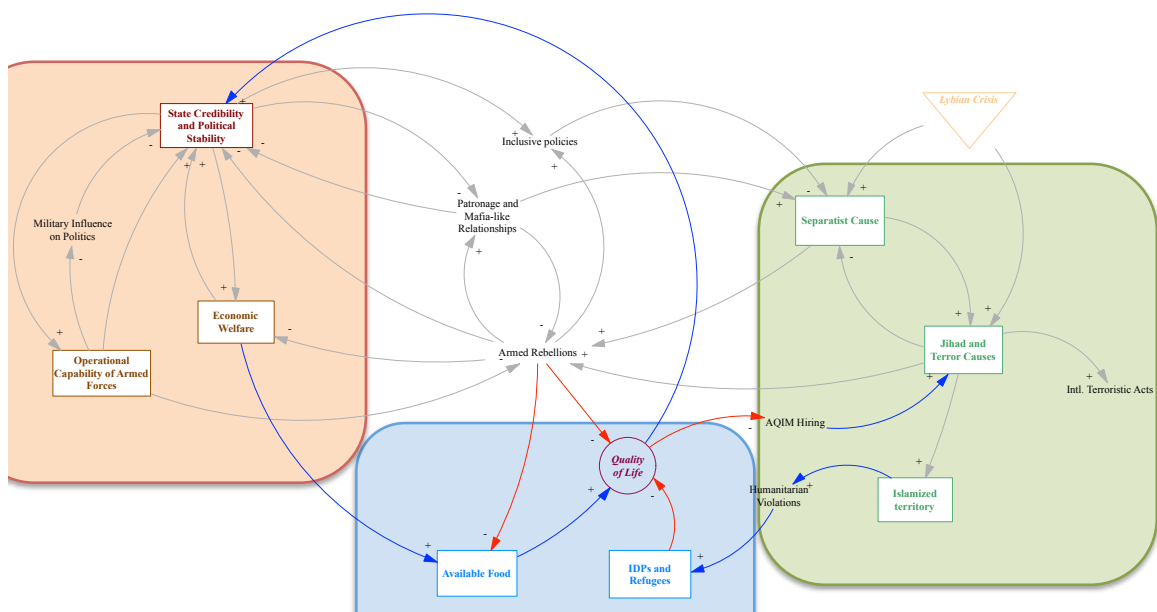
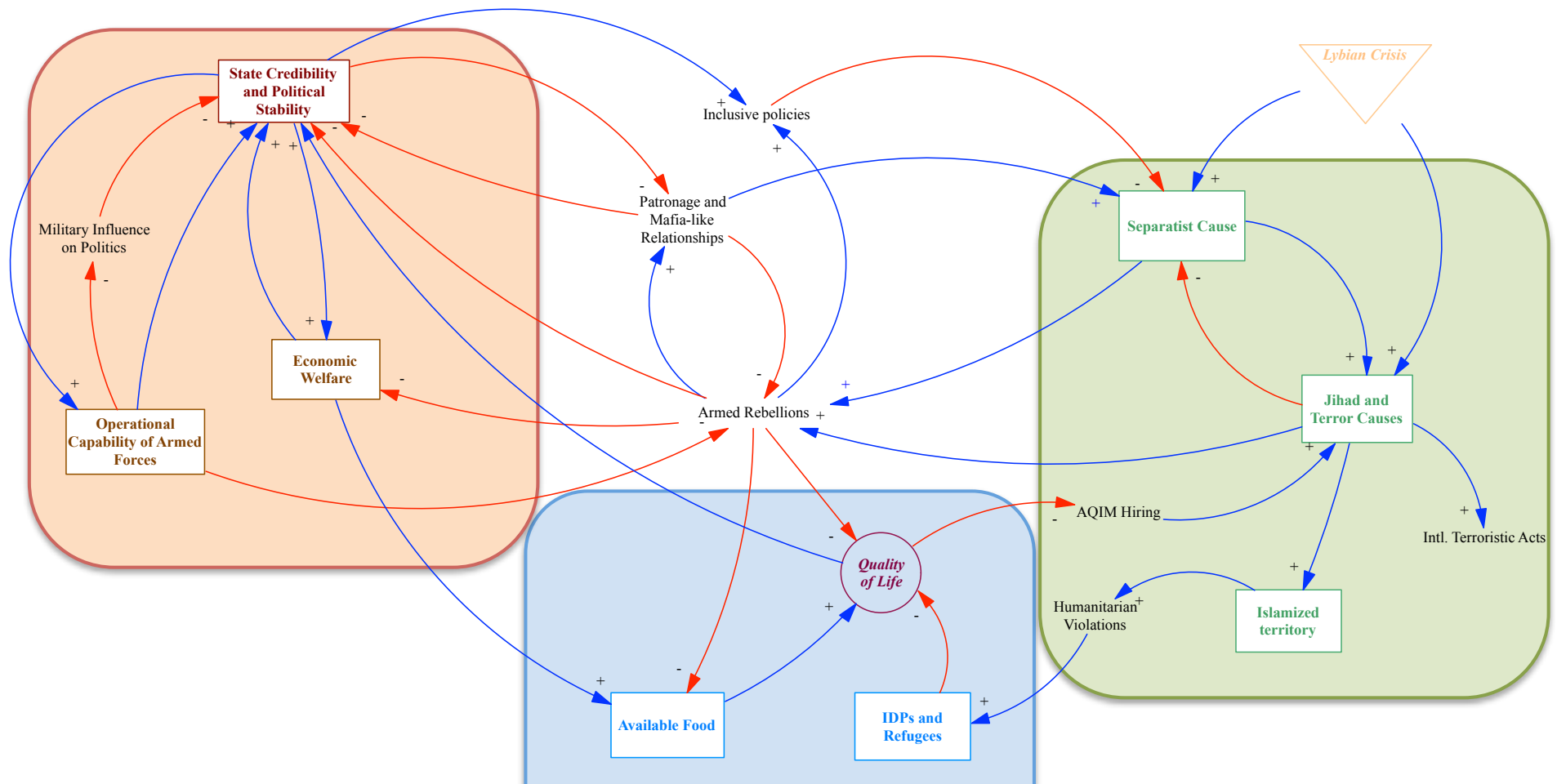**Figure 15: Closing the loops to the Humanitarian Conditions Sector**

Figure 16: Final Causal Loop Diagram[4]

Within the diagram:

- State Credibility and Political Stability
- Military Influence on Politics
- Economic Welfare
- Operational Capability of Armed Forces
- Inclusive policies
- Patronage and Mafia-like Relationships
- Armed Rebellions
- Quality of Life
- AQIM Hiring
- Available Food
- IDPs and Refugees
- Humanitarian Violations
- Separatist Cause
- Jihad and Terror Causes
- Islamized territory
- Intl. Terroristic Acts
- Lybian Crisis

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[4] Notice that the positive link between *Quality of Life* and *State Credibility* has been slightly redesigned in terms of layout as in fact now it does not do the wide turn as in Fig. 15.

6. INSIGHTS & CONSIDERATIONS

After building the Causal Loop Diagram, let's now delve into its details and see if we can identify any Systems Archetypes as well as the Crisis Archetype introduced in Figure 1. Also, at the end of this paragraph, we will analyze one of the possible policies (which, as a matter of fact, was one that was really undertaken after January '13) and get some additional insights on its likely/possible effects/impacts on the existing causal structure.

Let's start from the Poor Governance vs. Separatists Cause, as already described in figures 11 and 12. By looking at Figure 17, we can easily see that resorting to Inclusive Policies would have a benefic effect as it would reduce the Separatists Cause, thus decreasing Armed rebellions and ultimately help the State to recover its credibility. This loop is a reinforcing one.
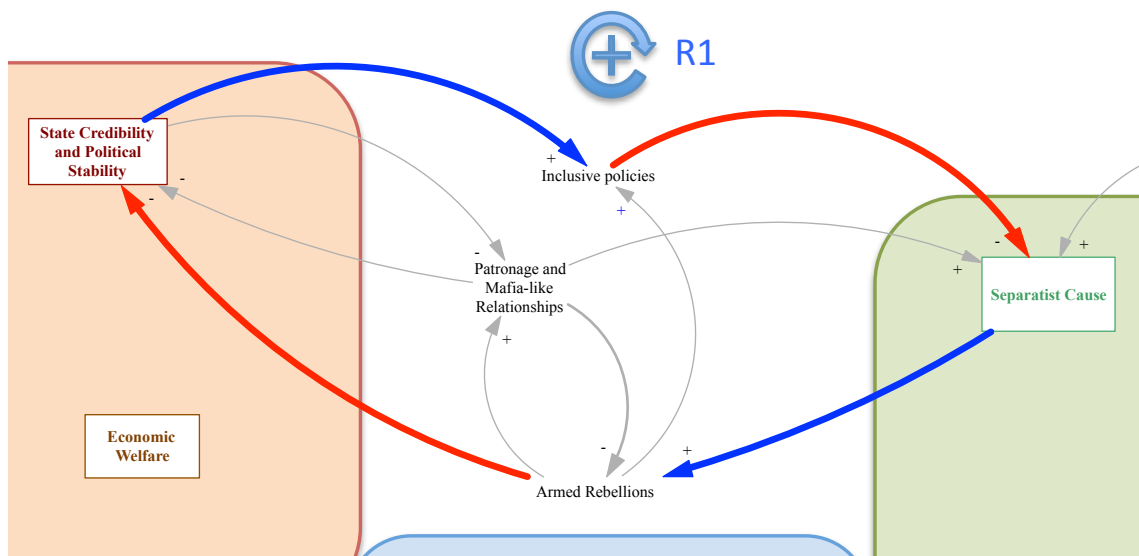
Figure 17: the benefic effects of inclusive policies

On the other hand, as already mentioned, the State Credibility and Political Stability is highly influenced by the corruption in the political class. This is able to create the effects depicted in fig. 18.
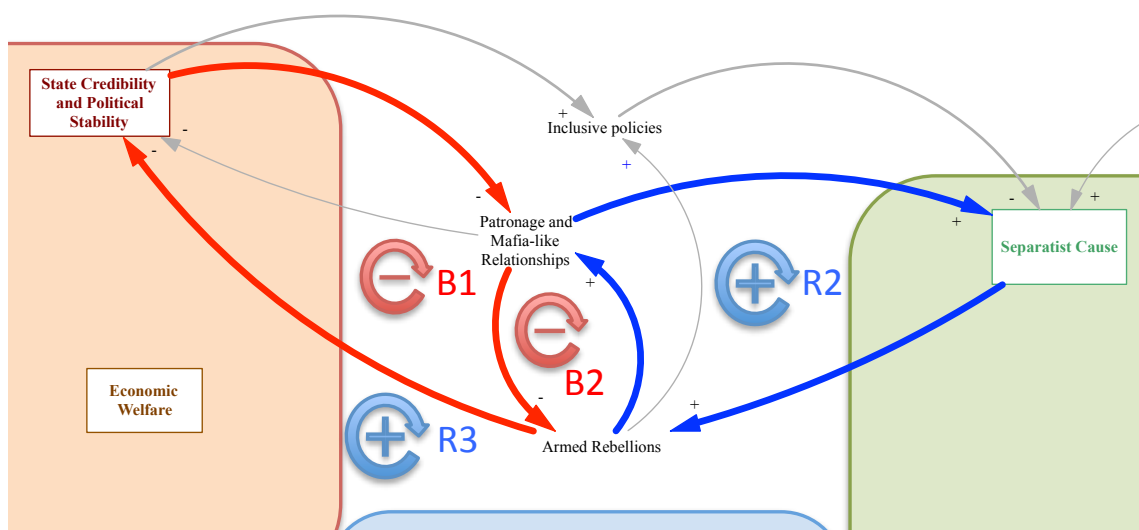

Figure 18: the effects of corruption

It is interesting to note that the balancing loop B1 represents a façade dynamic that helps the government recover some credibility by keeping, at least initially, armed rebellions at bay through collusive relationships (this dynamic goes also through B2). Of course, the problem here lies exactly in the fact that the political class keeps on resorting to collusive policies, which in the long run generate the reinforcing loops R2 and R3, which possess a higher loop dominance, thus bringing to even more armed rebellions. In fact, while resorting to Patronage and mafia-like relationships has the effect of keeping armed revolts at bay, this has also the effect to increase the anger in the oppressed population and also in the Separatists, thus bringing new Armed Rebellions and ultimately further reducing the Governmental support.

The integration of the effects and loops in figures 17 and 18 generates an additional effect (we could say a "side effect"…) due to the Government resorting to corruption, which would eventually further deteriorate the Government Credibility and Stability and thus the possibility to implement inclusive policies (Figure 19).
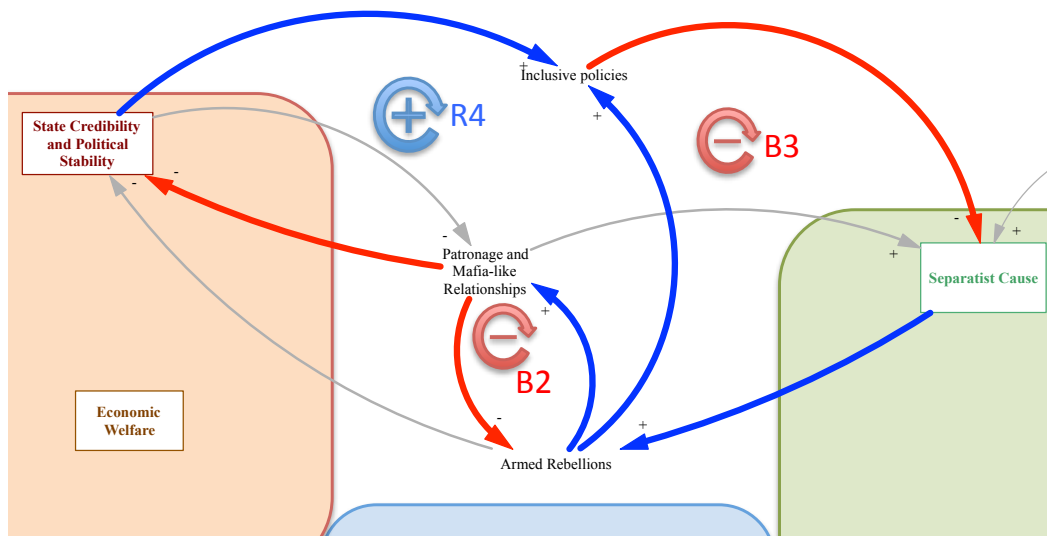

Figure 19: The side effects of a collusive political class

If we conveniently rearrange the various links, as shown in Figure 20, we come to have the very well known system archetype "*Shifting the Burden*".
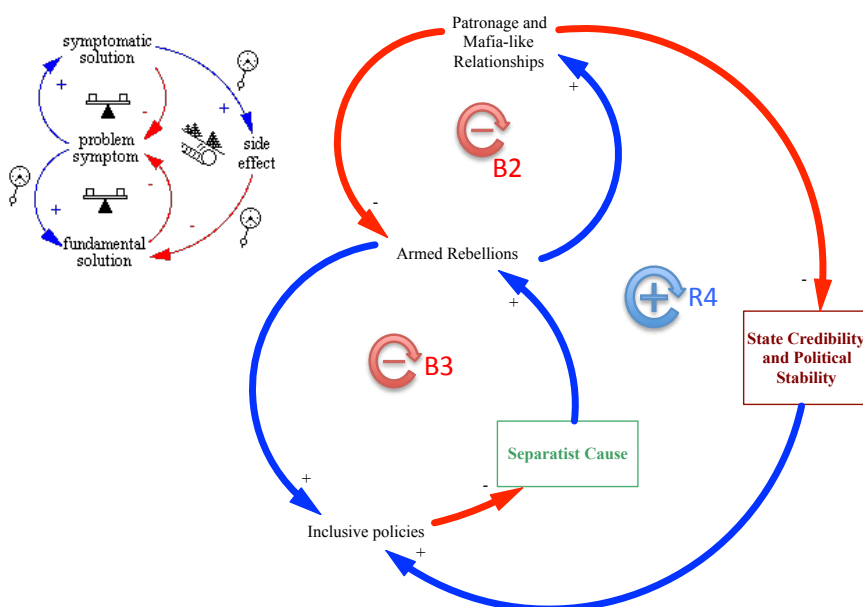

Figure 20: "Shifting the Burden" unveiled

This tells us a lot of what has been going on for years in Mali and what would be the real solution to the Crisis: the fundamental solution to the long-known problem of armed rebellions, that would be to solve the Tuareg issue, has always been more or less consciously neglected to the advantage of the implementation of easier policies involving corruption. The latter has had its inevitable side effects of further mortifying the political class, which, in an all-collusive style, would surely counter any push towards the implementation of Inclusive Policies, thus further radicalizing the problem.

By keeping our focus on the problem of the Armed Rebellions, we can see (as also described in Figure 13) that it has of course the effect of depressing the economy, which in turn would further bring the State Credibility & Stability down. This in turn would render the Armed Forces quite ineffective in their operational duties thus allowing for space for further Armed rebellions. This positive feedback loop (R6) is depicted in Figure 21.
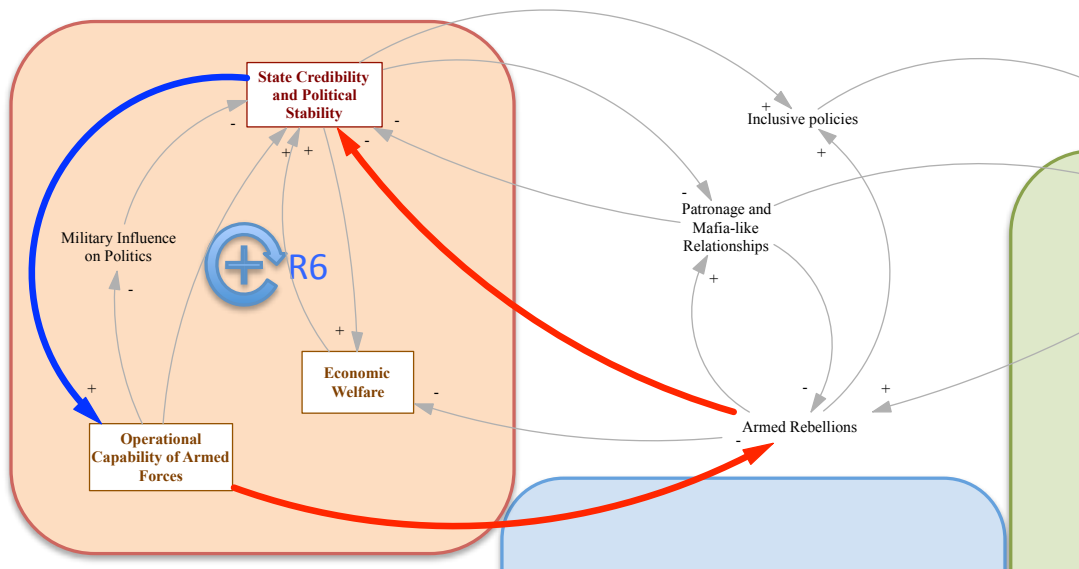

Figure 21: A low State Credibility renders ineffective any Military Intervention

As we have had the chance to describe in paragraph 5, in certain countries, depressing the Operational Capability of the Armed Forces has the effect of making the higher Military Ranks get interested in the political life, influencing it heavily and thus further contributing to bring down the Political Stability of the country. This is another interesting reinforcing loop (R5, in Figure 22).
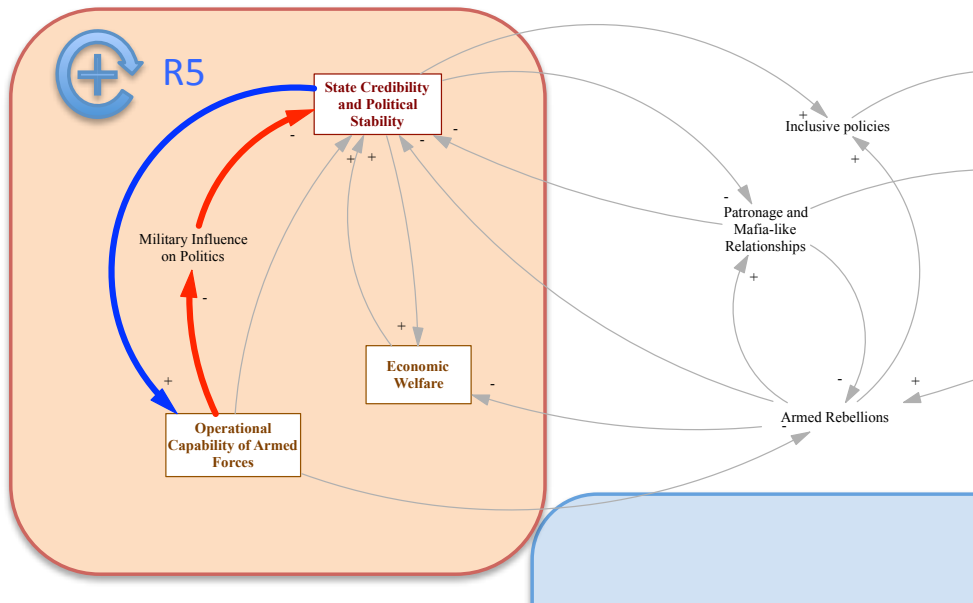
Figure 22: The effect of Military Influence

If we shift now our attention to the Violence Sector, we can identify the first inter-sectorial feedback loop, and namely between the Poor Governance and the same Violence sectors, as described in Figure 23.
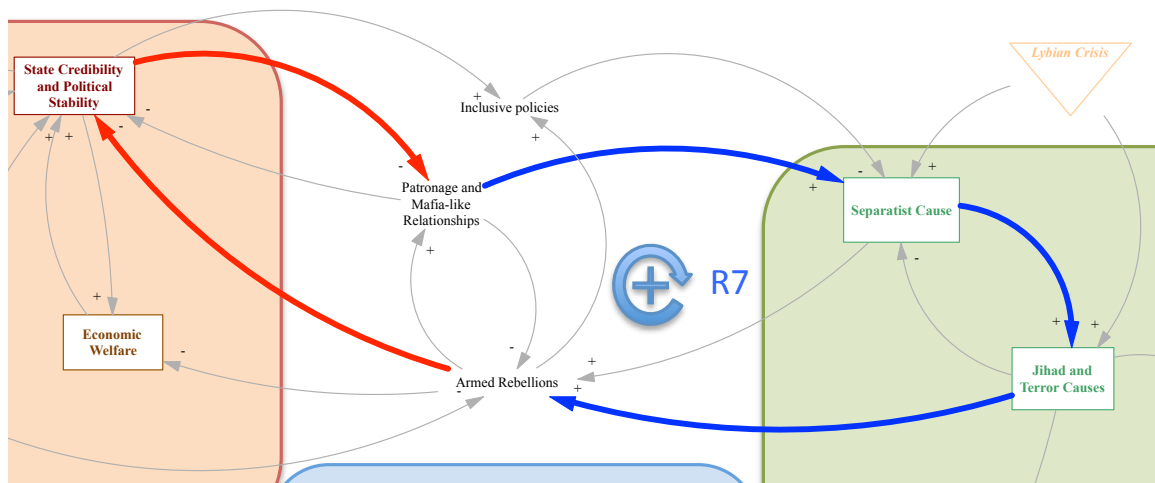

Figure 23: Intersectorial feedback loop between Poor Governance and Violence

This positive feedback loop basically explains how corruption drives more violence that deteriorates further the political stability, thus introducing even more corruption in the Government.

If we move our focus on the third sector, the one of Human Conditions, again we can identify the other two inter-sectorial loops, and namely:

- the one between the Human Conditions and the Violence sector (Figure 24), which basically described how the poor human conditions create an environment and climate of despair where AQIM can easily recruit new forces, that basically creates even more violence and humanitarian violations
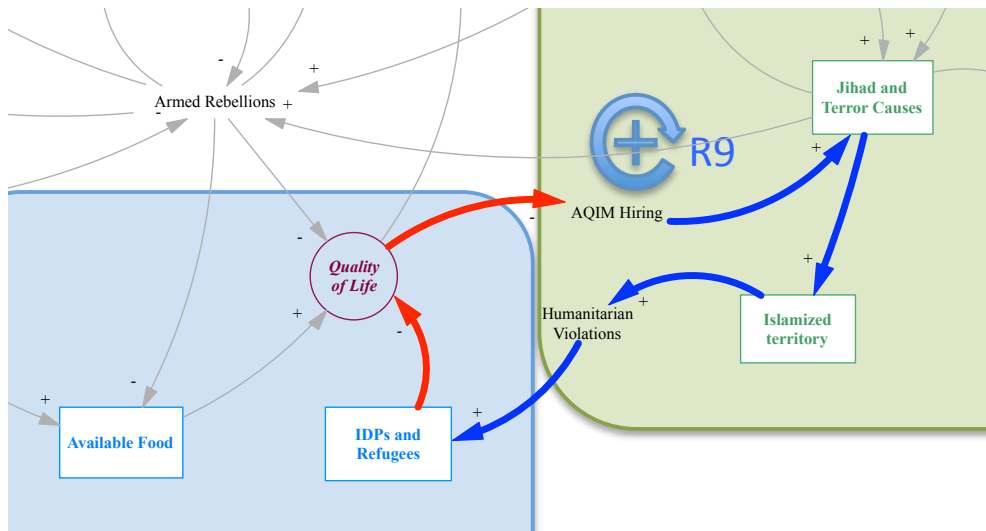
27

Figure 24: Intersectorial feedback loop between Violence and human Conditions

- the one between the Humanitarian Conditions and the Poor Governance (Figure 25), where we can basically appreciate the loop that describes how the government credibility is affected also by the economic and social situation.
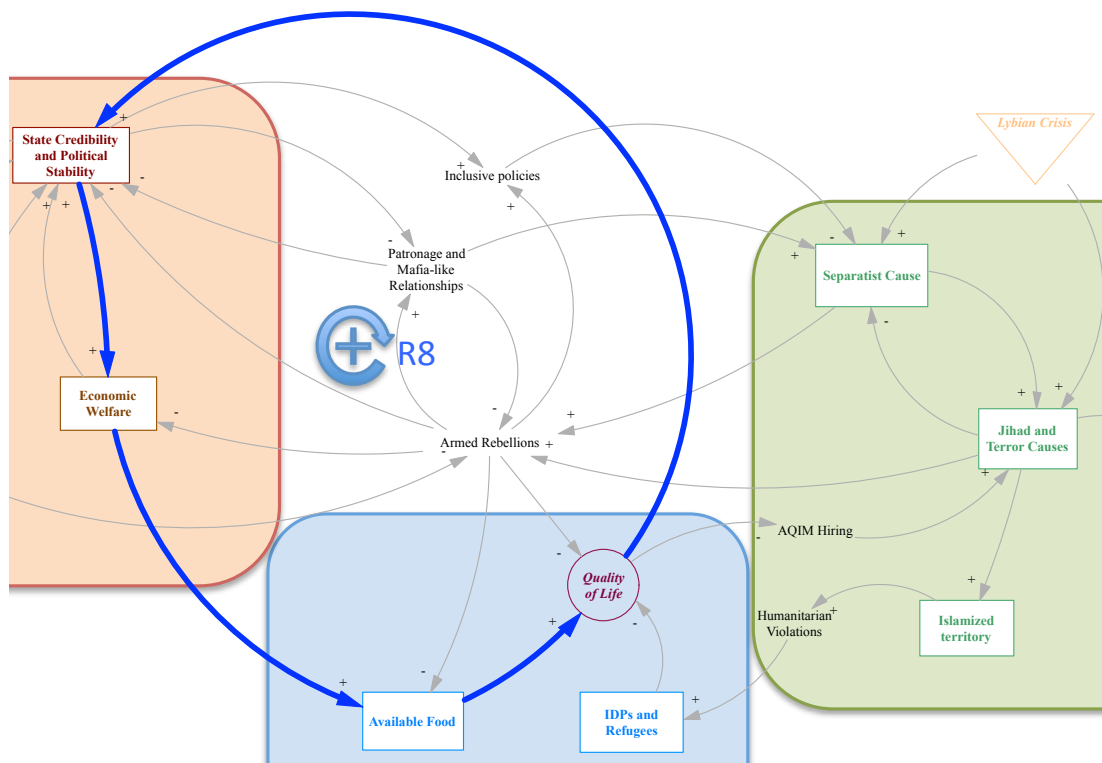

Figure 25: Intersectorial feedback loop between Human Conditions and Poor Governance

By looking at Figure 1, we see that there are also two "global" feedback loops, one that acts "clockwise" (the outer one, with reference again to Figure 1) and another that develops "counterclockwise" (inner one). We can see that these two reinforcing feedback loops are effectively present, as shown in Figure 26 and Figure 27.
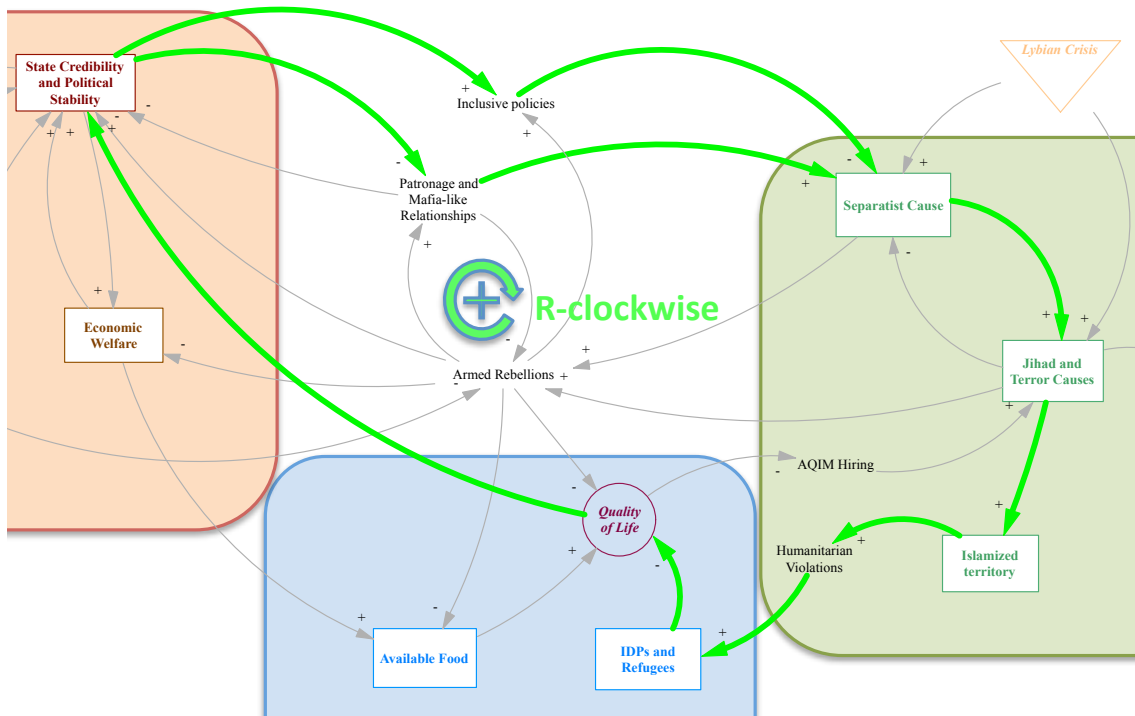
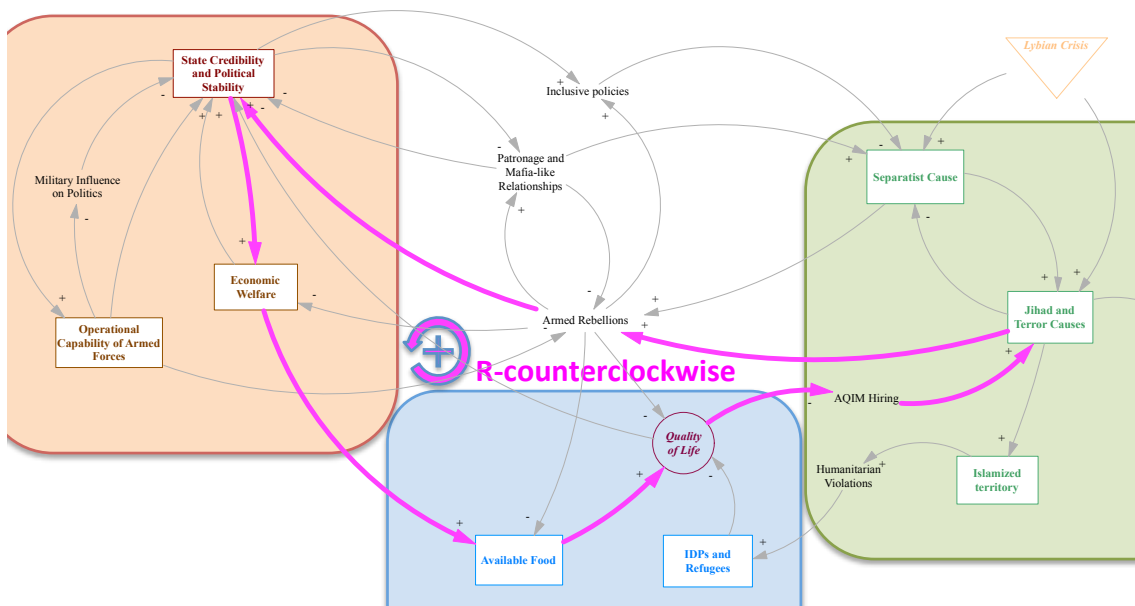**Figure 26: Outer Reinforcing loop (clockwise - green)**

Figure 27: Inner Reinforcing loop (counterclockwise - magenta)

We conclude this section by analyzing the likely effects of one of the potential policies decided by the International Community in order to try to solve the matter: the External Military Intervention (see Figure 28). It is a policy that, as a matter of fact, has been put into being, starting from January '13, and is still ongoing as we write. Notwithstanding the relative quick success in freeing the towns captured by the Terrorist, the military effort, so far, have not been able to influence in a resolute manner the various issues at stake. and some side effect are starting to appear.

In fact, if the external military intervention is generally triggered by the fact that the Islamized Territory percentage (which is one of the variables measured by the international community) goes beyond a certain value, and if such intervention is generally aimed, on one hand, at reducing the Islamized territory and on the other at

providing some help to the local Armed Forces in being more effective against Armed rebellions (even by direct intervention of the International Armies), this generally creates three side effects that are:

a. an "inurement" effect for which the local armed forces rely on the international armies, thus getting further depressed;
b. a surge in Jihadists terroristic acts due to the ignition of a sense of contrast to the "foreign occupation";
c. an induction to the perception of a sort of Neocolonialism attitude that ultimately further deteriorates the Government Credibility in the eyes of the various involved parties.

So far, we have thus analyzed the situation in Mali and we have seen what kind of effects the implementation of a "Foreign Military Intervention" policy could have. As additional considerations derived by our analysis, we can thus conclude that:

- As seen in Afghanistan and other situations alike, the political instability and the fault line between the minority of the north and the ruling ethnic groups of the south of Mali will provide the very well organized (and even better funded) terrorist organization AQIM with plenty of precious safe havens. This will lead, in turns, to a long involvement by the IC in Mali. Having said that, however, if keeping the terroristic threat under control is, for the time being, of the utmost priority, any prolonged involvement in the area that does not address the core issue of the separatist cause is bound to influence the very variables that favor the terrorists, namely the grievances and the recrimination of the downtrodden Tuareg minority.

- The diverging interests between the Tuareg secular separatist cause and that of the Islamic fundamentalists have to be exploited to dig the ground out of the Jihadist and terroristic organizations. To this aim, however, a season of dialogue and inclusiveness between the Malian government and the Tuareg separatist has to be encouraged. But, as mentioned many times before, only a strong and credible ruling class can realistically venture in this never-before attempted journey. Building up a proper Malian Army capability will be key to securing adequate support to a credible government. This step, though, should be performed in addition with some other tasks, specifically in the field of Nation Building, so to eradicate (as much as possible) the use of degraded form of control, such as bribery, corruption and collusive policies with local power brokers.

- Notwithstanding the concerns of the IC about the level of military capabilities possessed by some of the African States who currently are (or have offered to) contributing to the solution of the problem, it is imperative to put in place a military mission under the aegis of the regional powers (AU, ECOWAS). The risk of rekindling the never extinguished perception of neo-colonialism increases exponentially for every day that matters remains in the hands of western nations (namely France and other European partners).

- Lastly, not to be overlooked, are the prospects of Mali as a nation that has to struggle to rise from extreme poverty. Any chance to resume a path of growth and development rests on a precarious balance involving climate, external help, internal and regional stability. Such extremely unfavorable conditions are made even worse by the prospect of a stagnating economy, a growing population and a large mass of young people whose future perspectives are grim. The extremely young, massively unemployed and dangerously poor majority of Malian people are today's and tomorrow's problems. The Islamist surge is one of its symptoms. And terrorism, as well known from many lessons learnt, feeds itself on large masses of desperate people, with lots of recriminations and very little to lose.
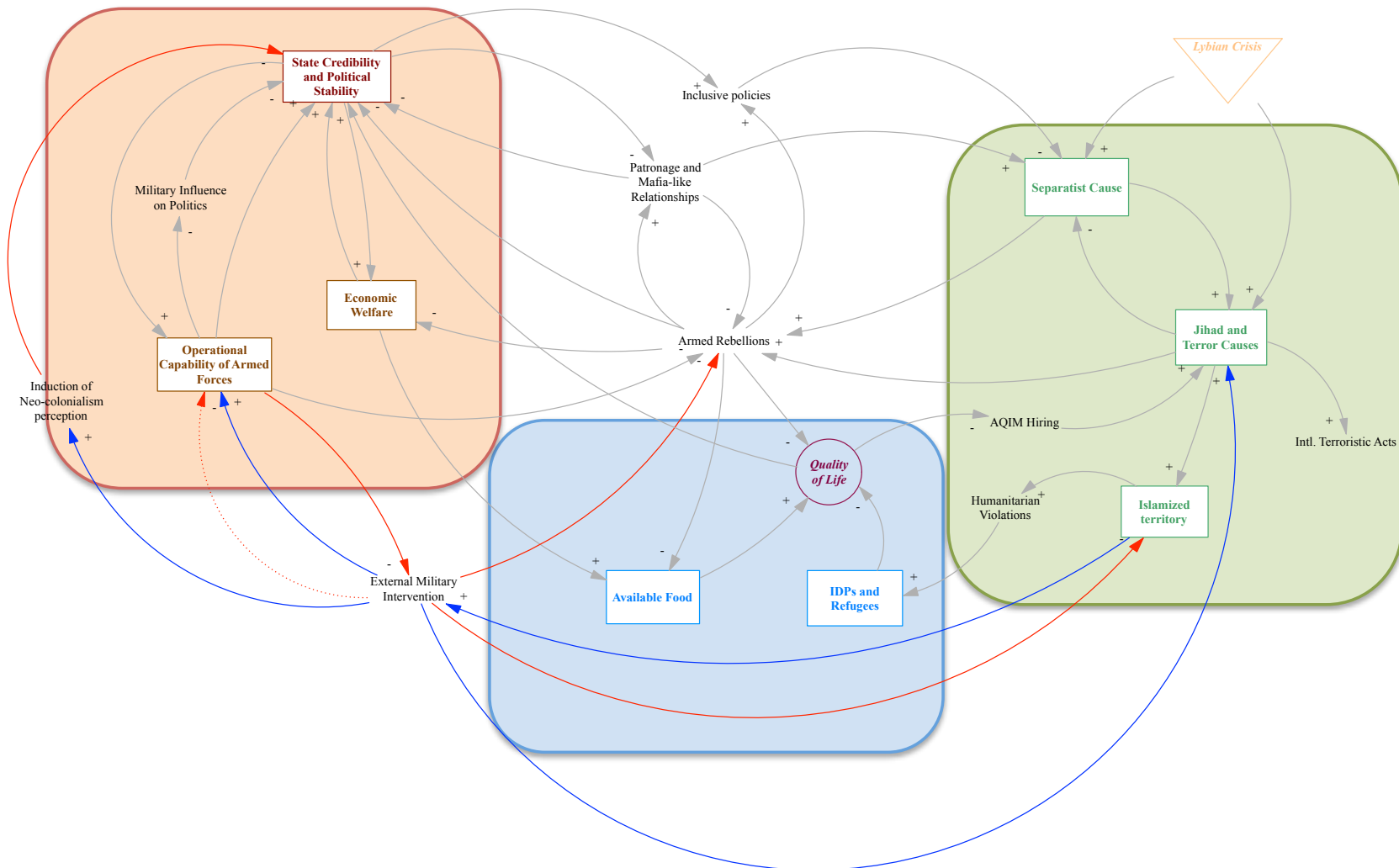
Figure 28: Policy Analysis: the effects of an external military intervention

7. CONCLUSIONS & FUTURE WORK

So far, we have been able to assess a possible use of the System Dynamics / Systems Thinking approach to the analysis of a Crisis Situation, by introducing a phased approach to the analysis and by identifying a proposed possible System Archetype describing a crisis. Of course, as it is a proposal, its ultimate "existence" will surely have to be demonstrated by further applying this methodology to a wider number of cases, past and present. However, we have showed that, at least for the case of Mali, such a Crisis Archetype seems to hold and through the proposed methodology, we have been able to explain many of the issues that Mali is today facing, also following how things have been developing over time.

We have been able to achieve this by keeping our analysis at a "Goldilocks" level. The "Goldilocks Principle" describes a situation that is *just right* in a manner akin to that portrayed in the "tale" being told. The concept prevails not only in literature, but also in other sector of the human knowledge, like astronomy or economics. For instance, a Goldilocks planet is neither too close to nor too far from a star to rule out life, while a Goldilocks economy describes one which is sustaining moderate growth and low inflation, which is seen as allowing for a market friendly monetary policy.

As reported in our introduction, in fact, a common ground must exist between a quick though explanatory approach and a full-scale one, where the need to develop a full scale and time-consuming systemic understanding of the area comes to terms with the pressure to get the action going before is too late. A "Goldilocks" approach (which is "just right") is neither too linear and simplistic, which would surely lead to timely, but likely ineffective, courses of actions, nor it is too brain-intensive which would, eventually, produce an accurate and detailed comprehension of a crisis but with a high risk of eroding massively the little precious time available for intervention.

Again, it is worth noticing that this analysis has mainly been used as a briefing for describing at high level the actual (as it was in January '13) situation in Mali, and of course could have been improved by delving into further details. All the same, it serves the purpose to describe an approach to the analysis of Crisis Situation and we can say that, even at this level of detail, it quite well grasps the main elements of the story.

Envisioned developments for this work are to:

- explore the likely impacts of other possible policies
- implement a quantitative Stock & Flow Diagram that is able to validate, through simulation, the qualitative model by matching the historical data and by allowing decision makers to experiment with the model in order to investigate additional policies
- apply our goldilocks methodology to other Crisis Situations (past and present) in order to validate the Crisis Archetype that we proposed

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