

# ***The Origins of Terrorism: How an Obsolete Model of Civilization Produces Modern Terrorism***

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## ***Abstract:***

This work argues that the conventional interpretation of terrorism as a subjective political phenomenon arising from extreme emotions, viewpoints, and beliefs is erroneous and that it is actually an objective phenomenon emanating from vital material concerns. From this basis a fundamental-level scientific theory of modern terrorism is developed and is tested against measured data. It proposes that terrorism originates in the drive to satisfy basic material needs, is caused by an imbalance between the environment and human population which leads to escalating competition and eventually violence over essential resources, and is characterized by conditions of resource scarcity. The data reveal that terrorist activity, resource scarcity, and resource consumption levels are connected, resource scarcity and terrorist activity are both intensifying and at comparable rates, and countries having lower resource consumption tend to experience greater terrorist activity. These findings lead to an alternative and substantially different approach to terrorism.

## ***Introduction***

After the attacks of September 11, terrorism became widely recognized as a significant threat to modern civilization, potentially on par with other global scale issues like climate change, resource depletion, species extinction, and population growth. This concern is evident in the U.S.'s National Strategy for Combating Terrorism which describes terrorism as '*a clash between civilization and those who would destroy it*' (Bush, 2003: 29). Since the U.S. led War on Terror was launched in 2001 vast resources have been devoted to military operations, research, and other measures to help understand and address the issue. The financial cost to the U.S. for the war was estimated at over \$5.6 trillion by the end of fiscal year 2018 (Crawford, 2017: 1). The

efforts, however, have had little success at actually achieving the desired goals of eliminating, reducing, or at least containing terrorism despite nearly twenty years of extensive counterterrorism operations. Terrorist activity has declined recently, but on the global-scale it has steadily increased to historically high levels in terms of the number of incidents occurring annually, countries experiencing incidents, and resulting deaths, and the long-term trend is clearly upward (see GTD data Fig. 2; Global Terrorism Index, 2017: 4). This calls into question the conventional, or orthodox, assessment of the issue on many levels from the fundamental understanding to the countermeasures based upon it. While there has been much speculation on the matter no meaningful or convincing explanation has been provided within the context of a substantial theoretical description of the phenomenon. Some argue that the U.S.'s approach to and characterization of the problem have been reactive, vague, counterproductive, and lacking a historical perspective, and they assert that a more complete understanding is needed (Duyvesteyn, 2004; Shrivastava and Mitroff, 2005; Cronin, 2006).

When consistent, substantial attempts to solve a problem do not succeed, it is a clear sign that the wrong approach is being taken and that the general understanding of the issue itself may be entirely erroneous. I argue that this is exactly the case with the War on Terror and the conventional view of terrorism. The countermeasures of the war have been ineffective because the conventional understanding of modern terrorism, which produced them, is fundamentally inaccurate and has resulted in misguided, inappropriate efforts. Additionally, I suggest that the phenomenon is escalating and spreading across the world due to large-scale, material factors which have yet to be considered. This work aims to help overcome these shortcomings by establishing a

more accurate and comprehensive understanding of terrorism as a general phenomenon. To accomplish this I develop a detailed fundamental-level scientific theory of terrorism from basic principles, test it against measured objective data, and use it to suggest a more appropriate and effective approach to the problem. Before proceeding with this work, I will briefly outline the important features of the conventional understanding of terrorism to make its conceptual faults and practical consequences clear.

### ***Background and Theory***

#### ***The Conventional View of Terrorism: a Subjective Phenomenon***

Great efforts have been made to understand and explain terrorism, but they have failed to produce any meaningful theory that describes the phenomenon accurately and in detail. Explanations abound but most are merely generalized speculation and none constitute what could be considered a genuine scientific theory. Strictly speaking, a meaningful theory clearly describes the relationship between a cause and its effect, identifies the important mechanisms and variables involved, and has some factual basis, but such a theory is currently unavailable. Without an adequate theory to provide guidance, much research on the topic consists simply of excessive data analysis in a search for correlations and presumed causality. This type of directionless activity, explains Kuhn (1962:15-17), is indicative of a field that is immature and lacks a paradigm, i.e., a coherent, meaningful theory which describes the phenomenon of interest in detail and accurately and is widely accepted by those in the field.

While there is no theoretical paradigm available to discuss numerous definitions of terrorism have been created over the years and they are direct reflections of the

conventional view. Terrorism is generally described as the strategic use of extreme violence by non-state entities against a target, civilian or state, to achieve an objective that is political, social, or religious in nature (Crenshaw, 1981; Bush, 2003: 1; Tilley, 2004; Young and Findley, 2011; Enders and Sandler, 2012: 4-7). Terrorism is most commonly considered to be a political phenomenon, but it is often thought to involve religious and social aspects as well. Enders and Sandler (2012: 4) assert that the violence must actually have a political motive to even be considered terrorism. Some have suggested that terrorism may have some economic basis, but this possibility has largely been dismissed. Sandler (2014) provides an informative review of research examining conventional economic factors and terrorism, noting a spectrum of contradictory findings with no consensus despite a substantial body of work. Commonly cited objectives of terrorists include autonomy, changes in government policy, expulsion of foreign influences, and revenge or redress for human rights violations (Crenshaw, 1981; Maleckova, 2003; Tilley, 2004; Li, 2005; Chenoweth, 2010; Krueger and Young and Findley, 2011). Although terrorists are extremists they generally considered rational, sane individuals who are driven by political issues (Crenshaw, 1981; Enders and Sandler, 2012: 13; Shapiro, 2013: 18-21).

In my view, these are the salient, core features of the conventional characterization of modern terrorism and it has significant, far-reaching consequences, so we should be fully aware of its meaning and implications. Arguably, the cornerstone of this entire conception is that terrorism is a primarily political phenomenon. This seems reasonable, but we must realize that it is simply an *a priori* assertion that has no real theoretical or factual basis. As Arendt (1958: 7-14) explains in detail, politics deals with the general organization of society and concerns fairly advanced matters such as

the form of government, type of economic system, role of religion, etc. These are undeniably important considerations but they are, in reality, arbitrary, subjective matters. In a strict sense, the concerns of politics are at the apex of society and are distinct from basic, objective matters, such as satisfying the material needs of humans. Thus, in the conventional understanding it is assumed, or asserted, that terrorism is not related to basic, material matters, but is concerned mainly with issues that are subjective, non-essential, and negotiable. It is viewed as an issue of hearts, minds, and principles (i.e., things that can be changed) not of the physical body.

This sounds like a plausible characterization, but it actually has some critical faults. Among other things, I suggest that it misclassifies the phenomenon and misinterprets the objectives of terrorists, in particular, what they actually are and their true motives. Another inconsistency is in the interpretation of the terrorist's behavior. It has been well established that terrorists are rational actors and this implies that whatever motivates them to persistently take such extreme action must be something necessary and critical. However, engaging in well-organized, sustained violent conflict over arbitrary, subjective matters seems unlikely for rational actors since they are not driven by whimsical, fleeting emotions, viewpoints, and beliefs. Another critical shortcoming is that no meaningful explanation has been offered as to how, why, and under what conditions factors such as emotions, ideological views, or religious beliefs produce terrorism when it was previously absent or why people who have coexisted peacefully for long periods suddenly become locked in violent conflict. In reality, every living human has extreme emotions, views, and beliefs, yet very few individuals are involved in any type of violent conflict. I argue that these things are not causes of terrorism, as is conventionally claimed, but are actually the results or symptoms of it.

Emotions, views, and beliefs naturally become involved once a conflict has begun, but they do not bring it about.

Lastly, I note that the conventional characterization is not merely an academic matter, but is something that has significant implications and serious, real-world consequences. It implies that terrorists have various options and can be persuaded to behave differently if properly encouraged. This has been a basic strategic assumption of the War on Terror and many decisions have been based upon it. Consequently, destructive and costly military operations have been undertaken to discourage terrorist activity, but they have met with little success. Another implication is that science will have limited use since it is strictly valid for matters that are material and objective, not subjective and arbitrary. It is not possible to observe, measure, or quantify emotions, views, or beliefs, thus science can reveal little about them. Consequently, the study of terrorism is reduced to continued blind analysis of data and unverifiable speculation.

### ***Developing a Scientific Theory of Terrorism: an Objective Phenomenon***

#### ***The Material Origins of Terrorism***

Due to the current escalation and spread of terrorism this is a critical time to take a different approach and explore dimensions of the issue which have received little attention in the past. Crenshaw (1981) and Lugovskyy (2015) both point out that it is important to consider the circumstances in which terrorism occurs and determine if broad political, social, and economic conditions make terrorism more likely. Much of the research to date, however, has been concerned with identifying narrow politically-oriented causes which tend to be varied, numerous, and case-specific. Comparatively little effort has been directed at developing a broad, fundamental-level understanding of

terrorism as a basic phenomenon, but this may prove to be a more fruitful approach to the issue than searching for isolated, case-specific causes. By any measure, a meaningful theory of terrorism which captures its most important dimensions is clearly needed. In this work, an objective, scientific theory is developed from basic principles with the goal of establishing a comprehensive, general description of the phenomenon that explains why it exists, what it is really about, what characteristic conditions are associated with its emergence, and how it can be effectively addressed. In other words, the aim is to determine the cause of the problem and find a solution.

I begin by placing terrorism in the proper context as a phenomenon that persistently appears in the world despite determined efforts to eradicate it. The National Strategy for Combating Terrorism suggests that political violence may be endemic to the human condition, thus it is simply an inherent part of life in the world (Bush, 2003: 29). However, the human condition itself does not actually include politics or violence, they are merely some of our responses. While I disagree with Bush's claim, it makes an insightful connection between terrorism and the basic situation in which all human beings exist in the world, a natural starting point for this analysis. The human condition is a topic that has been thoroughly examined from many perspectives over the ages, but it could be described simply as the basic situations, concerns, events, and needs that characterize the human experience. Arendt (1958: 7-11) offers a salient and modern description of the situation, and in her view we are simply living beings coexisting on Earth with others of our kind in a world largely of our own creation (i.e., in civilization). An important consequence is that basic issues of biology, in particular satisfying material needs to ensure survival and wellbeing, are typically our first and most pressing concerns. More sophisticated, abstract matters, like political or social

issues, she argues, are actually secondary considerations that arise only after the more pressing material concerns have been addressed and satisfied (1958: 37). Huxley (1978: 237-239) gives a similar account and concludes that our basic material needs must be satisfied before anything on a higher level can be pursued. He also suggests (1978: 48) that the political situation in many countries today is actually driven mainly by these primal biological concerns. These are rather unsurprising conclusions, but they highlight that our most pressing concerns are basic, non-negotiable, materialistic matters stemming from our biology. I suggest that these are the origins of terrorism.

Humans must satisfy their basic material needs and since there is no choice in the matter they will persistently take whatever action is required to do so. While much of civilization is arguably directed toward this concern, Arendt (1958: 28-37) and Durant (1954: 6-9) explain that economy is primarily responsible for the task. This is evident from the origin of the word '*economy*' in ancient Greek which refers to the mundane, but essential, tasks related to '*household management*' or acquiring the basic necessities for survival. According to the Greek philosopher Aristotle, the family, village, and state all originate from our basic material needs and exist primarily for the sake of enabling a good life. That is, to satisfy our material needs so we can move on to higher pursuits, like philosophy and politics (Lekachman, 1959: 8).

Economy is not an isolated, stand-alone system, though. It functions in concert with the political, social, cultural, and other spheres of society to accomplish its goal. Because the different spheres of society are overlapping and integrated we should recognize that the means of other realms, such as the political or social, can be used to achieve economic ends and *vice versa*. Knowing this, we should not simply presume that the obvious characteristics of a means reveal the true nature of the underlying



motives. In the case of terrorism, I argue that the means which are typically characterized as political, religious, or social are ultimately directed at satisfying objective material needs, not settling subjective matters of emotion, belief, and viewpoint.

Economy is clearly important to this work since it is the means by which inputs from the natural environment are used to produce the goods, services, and other outputs that will eventually be consumed by a population to satisfy its material needs. In this work, I reduce the issue to an even more fundamental level by considering those inputs, (i.e., natural resources) in detail and do not undertake any conventional economic analysis. Later in this work, the availability of resources in the environment and their consumption by humans are examined.

Filling material needs is clearly a vital part of the human world but is there any theoretical basis or actual evidence to suggest that it has any connection with violent conflict, in particular, terrorism? Arendt (1958: 31) explains that the ancient Greeks viewed violence as a legitimate means to acquire the necessities of life, but it was not appropriate for the political realm where rhetoric was preferable. Violence was considered to be a crass, pre-political means for addressing more basic, but essential, concerns. Likewise, Durant (1954: 22) remarks that “*societies are ruled by two powers: in peace by the word, in crisis by the sword.*” If the necessities of life are not available then a crisis situation arises and some naturally resort to violence. In the political realm, however, there are options, so a true crisis situation never actually arises and persuasion is preferable. Although terrorism exhibits a broad range of characteristics, I suggest that it actually emerges from concerns that are non-negotiable, material, and objective, not arbitrary and subjective.

### ***The Conditions of Terrorism: Resource Scarcity***

The relationship between material needs and violence is understandable and perhaps there is a connection with terrorism. In his work related to the division of labor, Durkheim describes how an imbalance between population and environment can produce outbreaks of violent conflict, and the same process may be relevant here. Drawing from the work of Charles Darwin, he suggests that conflict between humans, as with all living organisms, over vital resources is a natural consequence of the primal biological quest to survive. If populations grow and become more concentrated, resource scarcity can arise and lead to conflict between competitors as it becomes more difficult to satisfy basic material needs. Durkheim describes the process as follows (Giddens, 1972: 153-154):

*If work becomes progressively divided as societies become more voluminous and dense, it is not because external circumstances are more varied, but because the struggle for existence is more acute.... So long as they have more resources than they need, they can still live side by side, but if their number increases to such proportions that their needs can no longer all be adequately satisfied, war breaks out, and it is the more violent the more marked this scarcity; that is to say, as the number of participants increase.*

This theory describes the outbreak of violence due to an imbalance developing between a system (i.e., human society) and its surroundings (i.e., the natural environment). The critical issue is whether the population's material needs are being met and anything that prevents this may lead to violence. The primary constraint identified is the scarcity of essential natural resources which is influenced greatly by the number of participants, or the population. Population drives the entire process on a fundamental level and sets the demand for resources. As the population grows, overall demand increases and the available resources must be divided among more

individuals. Thus, each person's share of those resources progressively diminishes and scarcity eventually arises. Another important factor that influences resource scarcity is the amount of resources available in the environment, which is affected by both natural and human factors. Overconsumption of resources by a population can cause depletion which reduces the amount available in the environment, thus leading to scarcity. While resource scarcity is a critical issue in this process, it is not something that can be easily defined, observed, or quantified. In general terms, it is a condition in which there are insufficient resources available to readily satisfy the need for them.

Another critical factor not explicitly stated in the theory is the issue of access, i.e., whether resources are actually available to a population for consumption, in raw form or as finished goods and services. This is commonly viewed as an issue of economy, but it also involves political, social, technological, and other considerations. Even if raw natural resources exist in the environment in sufficient quantities they must be transformed into the goods and services that are needed by a population and made available. Otherwise, needs will not be met simply due to a lack of access. These matters intervene between resources in the environment and their eventual consumption and are varied, constantly changing, and case specific. Thus, they are beyond the scope of this work and will not be directly considered here. However, access to resources is obviously evidenced by consumption which will be examined later in this work.

Most of the time the bare needs of people are adequately met, but scarcity-related violence does occasionally erupt in the modern world. For example, in 2008 a sudden shortage of basic necessities quickly led to global food riots with widespread violence erupting among the general population (United Nations Report, 2011: 61;

Brinkman, 2011: 5-8). This was a brief, chaotic event, but the same forces could conceivably influence sustained, organized violence. Klare (2001: 15-23) points out that the current global demand for resources is growing at an unsustainable rate and is driven by dramatic increases in both the human population and economic activity. This situation, he suggests, will inevitably result in greater competition and conflict between nations, but it most likely will not be confined to the state level. The drive to acquire vital resources may also result in greater non-state competition and conflict, like terrorism (Klare, 2001: 222). He argues that conflicts of the past have often been over political and ideological issues, but in the future they will be increasingly about vital economic matters, in particular, the basic resources needed to survive (2001: 213). Since the human population is becoming more concentrated in dense urban areas and is projected to continue growing throughout the 21<sup>st</sup> century this is undoubtedly an important matter to consider.

This analysis has produced a detailed theory which offers an objective, coherent explanation of terrorism, and it provides a markedly different understanding of the issue compared to the prevailing, conventional view. According to this theory, terrorism originates in the primal struggle to survive, a materialistic concern emerging directly from the basic human condition, and is most accurately classified as an issue of environment and population. It arises due to an imbalance between human society and the natural environment and involves violence associated with escalating competition over essential resources. The particular condition that brings about this violence is resource scarcity. Those who become involved in terrorism, either as active terrorists or supporters, may be unaware of the situation with resources, but simply realize that their material needs become more difficult to fill with time. They may perceive a threat to

their own survival and wellbeing and feel that their involvement with terrorism could help improve their material situation. Rational thinkers also realize that their own fortunes rise and fall with those of their close associates, so the effort may be an attempt to benefit both themselves and their particular community. This theory helps explain their persistence and zeal in the face of powerful, determined opposition and why they are willing to resort to violence so readily. Like others engaged in violent conflict, terrorists may use violence simply as a means to procure necessities that are difficult to acquire through conventional means and to eliminate any competition for them. Their primary concerns, therefore, are with basic objective matters that emanate from material needs, not subjective, arbitrary matters that are driven by emotions, beliefs, and views as is commonly thought.

### ***Related Work in the Literature***

It seems plausible that the relationship between the human population and the natural environment could have a significant influence on terrorism, but it is essentially unexplored at this time. Material needs have been given a good deal of consideration from the perspective of conventional economics, but economic influences have largely been dismissed as meaningful causal factors, and the environment has been almost entirely ignored. One goal of this work is to explore this relationship more carefully and determine if resource-related conditions associated with the environment and population have any apparent connection with terrorist activity. In comparison to political factors, there has been little detailed examination of these matters, but some researchers have touched on them.

On the topic of environment, Shrivastava and Mitroff (2005) note that little

consideration has been given to the more primal concerns that motivate typical human beings, such as their basic living conditions and general wellbeing, which could potentially encourage them to support or actively engage in terrorist activity. They suggest that the poor living conditions created by the scarcity, unequal distribution, and lack of control of resources drive some people to terrorism. Most work on the topic, in their view, has focused mainly on the conventional economic, social, and political aspects, but has failed to consider the ecological roots of the problem. Consequently, the primary countermeasures undertaken in the War on Terror have been narrow military responses which often destroy the environment and the natural resources that it contains. This may actually exacerbate the problem in the long-term, instead of solving it, by increasing resource scarcity and further degrading living conditions. At this point, Shrivastava and Mitroff have not presented any original research to support their assertions.

Dreher and Kreibaum (2016) also consider the influence of environment and examine the effect of natural resources on terrorism and insurgency. They note that the availability of natural resources is well-known to have an impact on the stability and peace of a region, but point out that this issue has received little attention as a potential cause of terrorism. They suspected that the presence of natural resources could be an important factor that influences the extent of terrorism, but found in their study that resource availability actually has little apparent effect on terrorist activity. However, they examine the impact of petroleum being available not the scarcity of essential natural resources, which is an important point. An interpretation I take of their findings is that terrorism is not driven so much by the greed factor (i.e., the emotional desire to become rich or powerful), but arises from actual material needs. Otherwise, the literature is

rather limited on the possible relation between environment and terrorism.

Sandler (2014) reviews research regarding the influence of conventional economic factors and notes that there is a spectrum of contradictory findings with no real consensus. A critical shortcoming of these conventional economic studies is that their analyses give no consideration to the natural environment, the source of an essential input (i.e., natural resources) of the economic process. Also, they are based mainly on abstracted conventional metrics, such as GDP and poverty, which may not be very meaningful for the areas (i.e., developing countries) in which most terrorism actually occurs. Such metrics are merely aggregate, post-hoc indicators that describe the formal economy in monetized terms, but they do not actually explain what happens or why and do not reveal if the material needs of a population are actually being met. They can be fairly informative for countries with modern, developed economies, but such metrics are far less meaningful for developing countries which typically have more basic activities that occur outside of the formal economy. Therefore, a more comprehensive, appropriate, and accurate analysis should consider the actual availability and consumption of basic resources which are used to satisfy material needs, not just abstracted conventional economic metrics like GDP.

### **Data: Natural Resources and Terrorism**

#### ***Production, Consumption, and Scarcity***

A primary interest of this work is the possible connection between terrorism, the material needs of humans, and the scarcity of essential natural resources in the environment, a topic which is largely unexplored at the moment. Some important issues to determine, therefore, are whether resources actually are scarce and whether the

material needs of a population are being met. In a simple sense, these are matters of resource availability in the environment and the needs a society. Are resources abundant and readily available to fill a population's needs or are they scarce and difficult to acquire? Unfortunately, there is no universal definition of scarcity and it is not specified by any absolute standards. Also, it is difficult to accurately determine a population's needs and whether they are being met since both are somewhat subjective. Therefore, in this work, scarcity of resources and satisfaction of needs are determined in a relative sense and are identified through an analysis of detailed data related to basic renewable ecological resources. Note that the resources considered in this study are renewable, i.e., they are naturally replenished, not non-renewable or fossil resources. Since fossil resources are not replenished it is a matter of fact that any consumption makes them scarce.

Regarding scarcity, the analysis considers whether resources are scarce compared to some reference point, not scarce in an absolute sense. The comparison shows how total resource levels in the environment are changing over time on the global scale and decreasing levels are interpreted to mean that resources are becoming scarce. Regarding material needs, the analysis considers how resource consumption levels vary relatively among populations at different geographic locations at a given time. Since needs and their fulfillment are actually unknown quantities, measured consumption levels are examined and are taken as an indicator of the satisfaction of material needs. At higher consumption levels needs are more likely to be met and resources are likely to be relatively abundant in the environment. Conversely, at low consumption levels needs are less likely to be met and resources are likely to be comparatively scarce. Of course, it is possible that resources are abundant in the



environment, but their consumption by the population is comparatively low for some reason, perhaps due to political, technological, social, or other constraints. It is also possible that resources are scarce in the environment, but the population somehow manages to consume them at high levels by some means, for example, by liquidating reserves or importing them. In the general case, however, consumption levels are ultimately constrained by resources availability in the environment, so both of these factors should be considered to fully understand the situation.

The production, or replenishment, and consumption of resources are the principal factors that influence their overall availability in the environment, i.e., in the total amount. These factors are accounted for in this study by the bio-capacity and Ecological Footprint, well-known measures related to renewable ecological resources. Measured values for these quantities are provided by the Global Footprint Network National Footprint Accounts 2016 Edition, a database which includes various environmental, economic, and demographic data on national and global levels. The Ecological Footprint measures the amount of ecological assets that a population of a region needs to produce the renewable natural resources (plant-based food, livestock and fish products, forest products, plant fiber, etc.) that it consumes and to absorb its waste, and the bio-capacity measures the productivity of a region's ecological assets. Each quantity is calculated on a national basis and is expressed in units of global hectares (gha) which indicates the amount of ecological resources that are available on a standardized hectare of land having average productivity levels (see Global Footprint Network website). In basic terms, the bio-capacity and Ecological Footprint are measures of the natural environment's rate of production of resources and a population's rate of consumption of them, respectively. The Ecological Footprint shows

the impact of a society on the environment and its capacity to meet its own material needs.

$$\text{resource scarcity index} = \text{Ecological Footprint} - \text{bio-capacity} \quad (1)$$

The difference between the Ecological Footprint and bio-capacity is defined here as the resource scarcity index (shown by equation 1), an important quantity in this analysis. It reveals whether the total amount of resources in the environment is accumulating or being depleted and is an indicator of resource scarcity. If the Footprint is greater than the bio-capacity, the index is positive and resources are being depleted and are becoming scarce. Conversely, if the Ecological Footprint is less than the bio-capacity, the index is negative and resources in the environment are accumulating or becoming more abundant. Note that this analysis does not determine the total amount of resource reserves that are stored in the environment, but indicates a change in the amount of resources, i.e., whether it is increasing or decreasing with time.

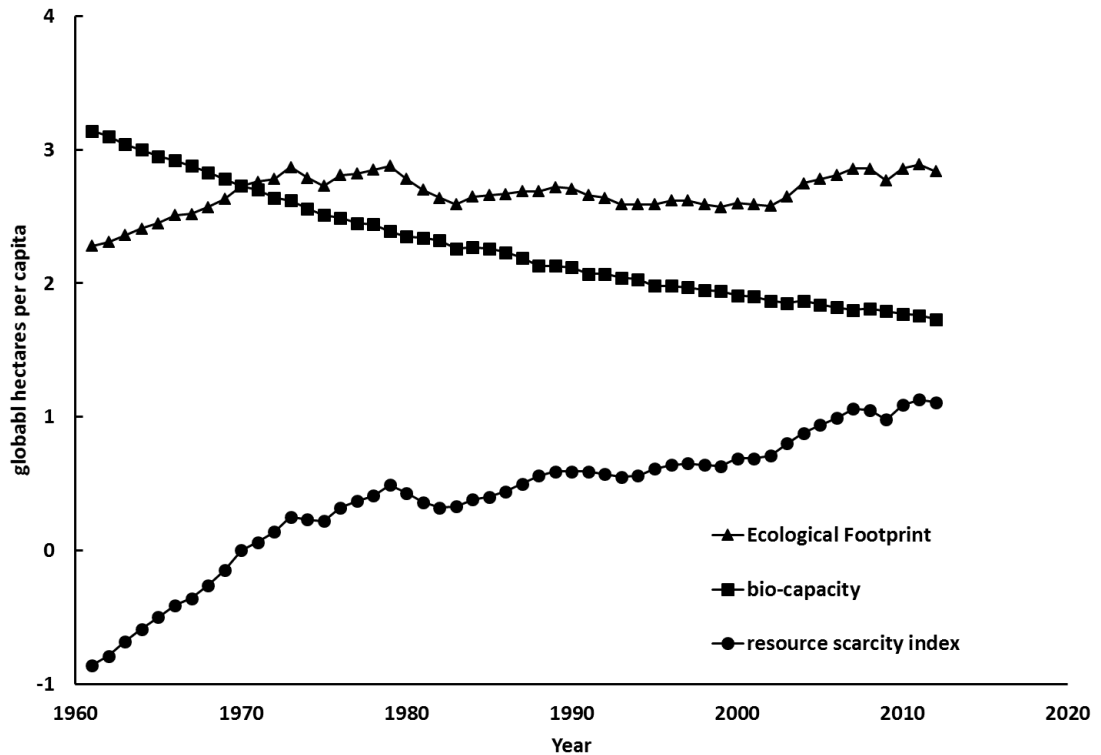


Figure 1. Bio-capacity of Earth, total human Ecological Footprint, and global resource scarcity index (all on a per capita basis). Around the year 1970 humanity's combined use of the ecological resources considered exceeded the planet's ability to renew them in a sustainable manner, thus these resources in the environment started to become scarce at this time. A positive resource scarcity index indicates that scarcity is increasing. (Data from the Global Footprint Network National Footprint Accounts 2016 Edition).

Data for the global scale bio-capacity, Ecological Footprint, and resource scarcity index, all on a per capita basis, between the years 1961 and 2012 are shown in Figure 1. The average consumption level (indicated by the footprint) has increased slightly during this period, but the change is modest at about 22%. The per capita bio-capacity, however, has diminished significantly and has been reduced by roughly half. This reduction in bio-capacity is primarily due to population growth, which divides the amount of resources available to each person, not to a decrease in the overall replenishment rate. The data show that prior to about 1970 the average Ecological Footprint was less

than the bio-capacity of the planet, thus the resource scarcity index was negative and total amount of renewable resources available was increasing or holding constant. After 1970, however, the global resource scarcity index became positive and the world overall has been in a period of increasing scarcity with a shrinking total amount of resources. Not only are the resources in question becoming scarce, but the rate at which this is occurring is increasing with time. This is due to both rising average consumption levels and population growth. The national-level data for almost every country in the world shows the same behavior.

Interestingly, the data reveal that average consumption levels were rising during this period even though resources started to become relatively scarce in the environment after 1970. This suggests that the average person was more likely to have his or her material needs met even though resource scarcity was developing. Of course, the distribution in consumption levels in most societies varies greatly and the average value is often not representative. Although some may enjoy growing consumption levels, others certainly will not and may even experience a decrease. In the next section, the relationship between the bio-capacity, Ecological Footprint and terrorist activity is examined.

### ***Resource Scarcity, Consumption Levels, and Terrorism***

In this analysis, a positive resource scarcity index indicates developing resource scarcity in the environment and a comparatively smaller Ecological Footprint indicates lower consumption levels by a population which suggests that its material needs are less likely to be met. If these two factors are fundamental drivers of terrorism, as the theory developed here suggests, then we should observe increasing terrorist activity as

resources become scarce and consumption of them decreases. To test this hypothesis data for terrorist activity, the bio-capacity, the Ecological Footprint, and the resource scarcity index are examined in this section. Terrorism data is taken from the Global Terrorism database (GTD) provided by the National Consortium for the Study of Terrorism and Responses to Terrorism which includes information related to terrorist incidents on national and global levels. The number of reported terrorist incidents is taken as the measure of terrorist activity and a larger number of incidents is interpreted to indicate higher levels of activity. In this work no differentiation is made between the various categories of terrorism (domestic, international, etc.) and only the total number of incidents is considered.

### *Resource Scarcity and Terrorism*

The global scale data plotted in Figure 2 shows the conditions for both natural resources and terrorism progressing in time over roughly the last half century. It shows the global resource scarcity index on an annual basis from 1970 to 2012 (y-axis right scale) and the annual number of terrorist incidents (y-axis left scale) on a worldwide basis from 1970 to 2017, both normalized by the world population at the year of measurement. The terrorist incidents begin at comparatively low levels in the early 1970s, increase from the late 1970s through the early 1990s, decline from about 1993 to 2003, and then steeply increase. The behavior seen in the data is not smooth, but the long-term trend is clearly increasing. Likewise, the resource scarcity index begins at about zero in 1970, then generally increases with several brief periods of small decline, which indicates growing scarcity. Both quantities on average are increasing with time and at comparable rates as the trend lines show.

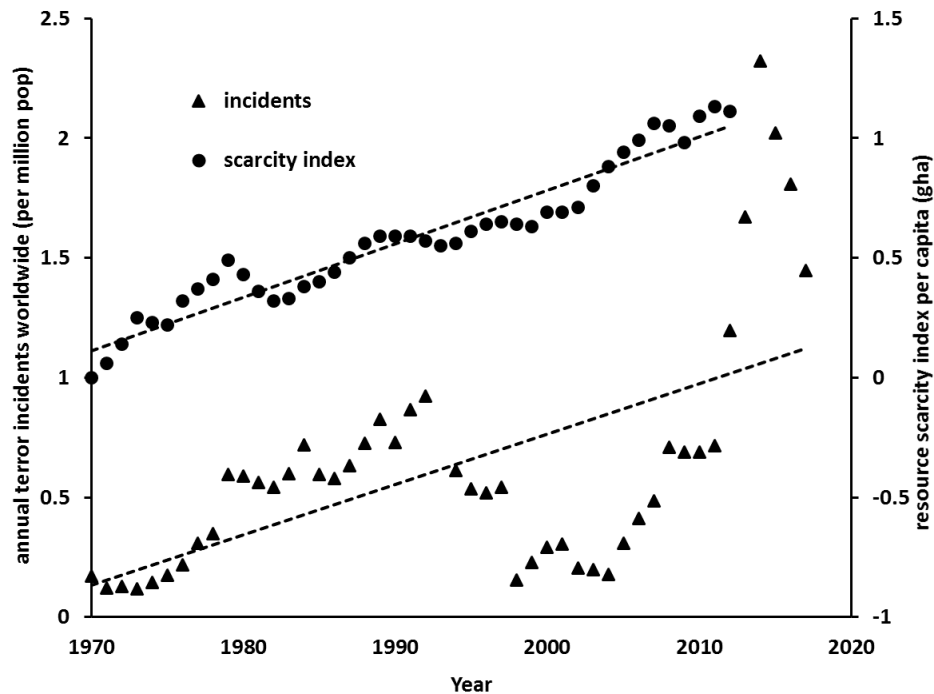
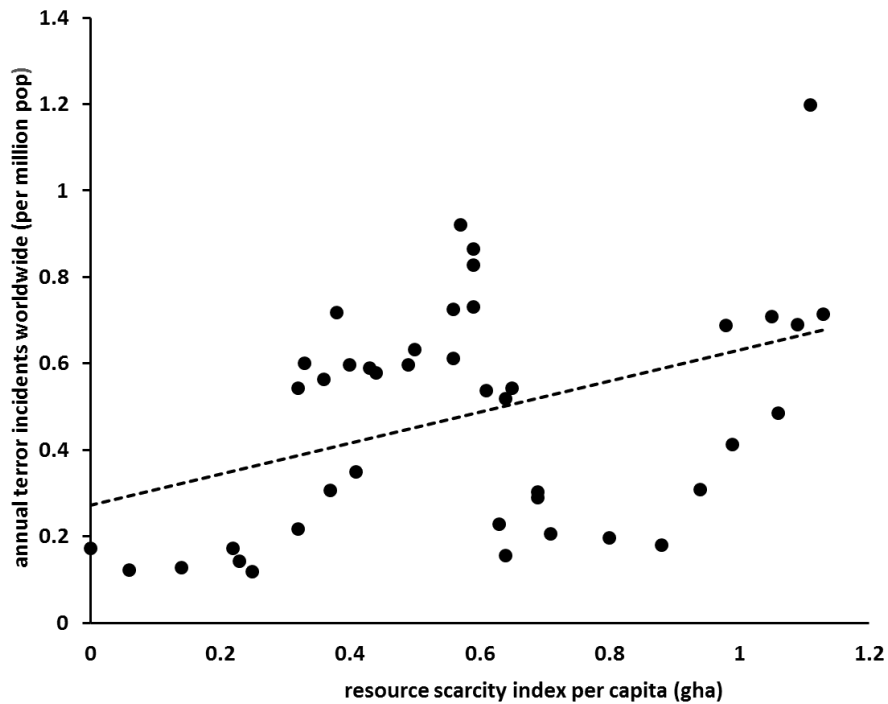


Figure 2. Per capita global resource scarcity index from 1970 to 2012 and the average annual total number of terrorist incidents worldwide per million in population from 1970 to 2017. Both the resource scarcity index and annual number of terrorist incidents show an upward trend during this time period, which indicates intensifying resource scarcity and terrorist activity. (Data from the Global Footprint Network National Footprint Accounts 2016 Edition and the Global Terrorism Database).

Figure 3 is a scatter plot of the global resource scarcity index and total number of terrorist incidents occurring worldwide annually from 1970 to 2012. The relationship is not smooth, but there is clearly an increase in the number of terrorist incidents as the index grows. That is, terrorist activity intensifies as resource scarcity develops at higher rates. Statistical analysis yields a correlation coefficient of 0.41, which suggests a moderate level of correlation for a linear relationship between the resource scarcity index and terrorist incidents.



*Figure 3. Per capita global resource scarcity index plotted against the total number of terrorist incidents worldwide per million in population from 1970 to 2012. An increase in resource scarcity corresponds to an increase in the number of terrorist incidents.*

### *Resource Consumption and Terrorism*

The data plotted in Figure 1 show that on the global scale resources in the environment are becoming increasingly scarce with time and this trend will likely continue both nationally and globally. Currently, however, there is a sizeable amount of geographic variation in the Ecological Footprint and this distribution in resource consumption can provide some valuable insight into the nature of terrorism. If the inability to satisfy basic material needs is an important driving factor of terrorism, then we should see higher levels of terrorist incidents in countries having comparatively lower Ecological Footprints, an indication of lower consumption levels and greater

unmet needs.

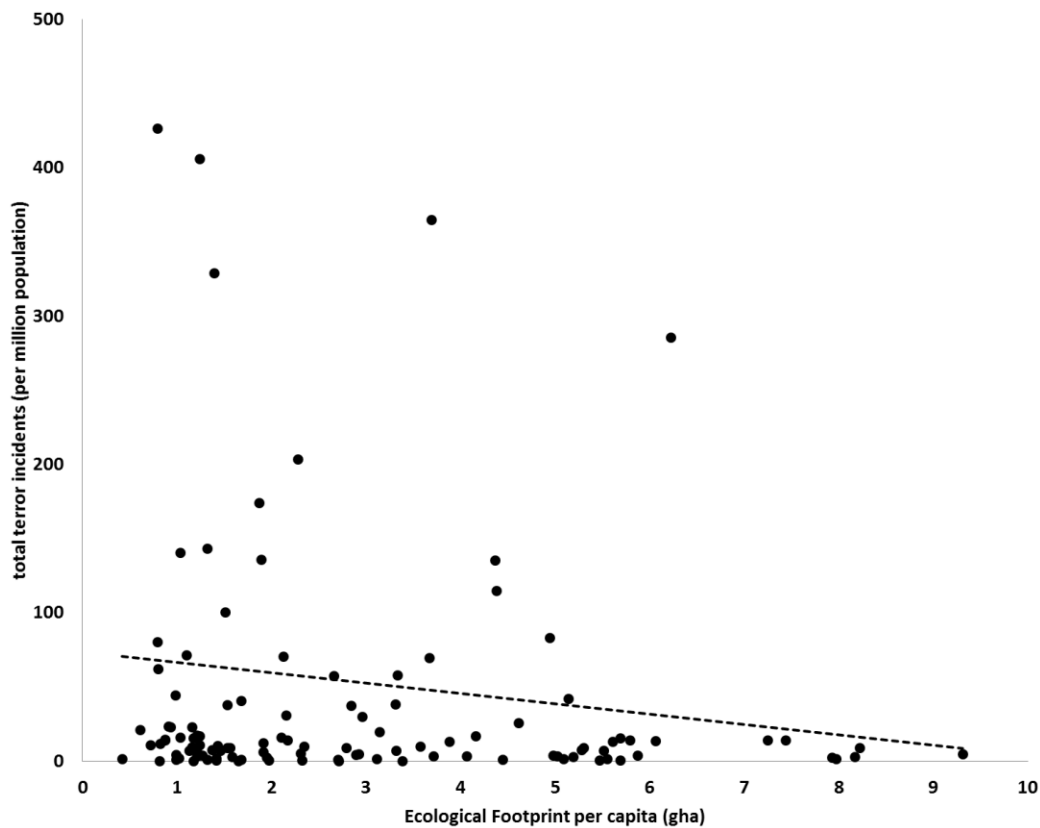


Figure 4. National level per capita Ecological Footprint in 2012 compared to total number of terrorist incidents occurring in a given country from 1970 to 2017. As the Ecological Footprint increases material needs are more likely to be met and terrorist activity on average decreases. Note that some data are off the y-scale on the chart.

Figure 4 is a scatter plot for individual countries showing the per capita Ecological Footprint measured in 2012 versus the total number of terrorist incidents per million in population occurring in that country between 1970 and 2017. While the Ecological Footprint has changed in the various locations during this period, the average change is modest, as Figure 1 shows, and in almost all cases it is an increase. Therefore, the value for the footprint from 2012 is taken to be representative for the entire time period. Only countries with a population greater than five million are



considered since terrorism is a somewhat rare event and smaller countries may not have sufficient scale, environmentally or demographically, to exhibit representative behavior. The data show that countries having relatively smaller Ecological Footprints (i.e., lower consumption levels) experience higher levels of terrorist activity on average compared to those with larger footprints. While most countries have only low levels of terrorist incidents regardless of their footprint, those countries that do experience high levels of terrorism have lower consumption levels, as the trend line shows. Note that several data points (occurring at low footprint values) are off the y-scale of Figure 4. The range in the figure shows most of the data points and is selected so that the general behavior is apparent.

### ***Analysis and Discussion***

The data reveal that higher levels of terrorist activity are generally associated with conditions of greater resource scarcity and lower resource consumption levels. Low consumption suggests that the material needs of a population are less likely to be met and it may be the result of resource scarcity in the environment. A global scale analysis shows that resource scarcity and terrorist activity are both increasing with time and at comparable rates. A national-level geographic analysis shows that countries having lower consumption levels of resources tend to have greater terrorist activity compared to those higher consumption levels. As Sandler (2014) suggests, those living in wealthy countries probably have fewer complaints because their consumption levels are comparatively high and their material needs are more likely to be met, thus the conditions are generally less conducive to terrorism. Also, these countries have more resources available to allocate to counterterrorism measures which helps to further

reduce terrorist activity.

While considerable spread exists in the data there is a clear correspondence between resource scarcity, consumption, and terrorist activity and this offers substantial support for the theory of terrorism proposed in this work. The theory suggests that as essential natural resources become scarce in the environment over time, due to a growing population and increasing individual consumption levels, competition for these resources intensifies and can escalate into violent conflict if the basic material needs of some cannot be satisfied. This conflict may emerge as terrorism in some situations. While most people are probably unaware of the changing situation with resources in the environment, they certainly recognize an intensifying struggle in daily life. These conditions may encourage some to engage in terrorism, either as direct perpetrators or as general supporters, because it is viewed as a means to eliminate the competition and improve their material situation. Rational actors certainly realize that their personal wellbeing is closely linked to that of their own particular community, so their involvement may be an effort to help both themselves and their community.

These findings suggest that the resource scarcity currently developing across the world could be responsible for the recent spread and intensification in terrorist activity and it provides favorable conditions for even higher levels in the future. Admittedly, there are many other factors that determine whether terrorism actually emerges and scarcity of resources itself does not guarantee its appearance, but may greatly increase the likelihood. These findings also suggest that when terrorism does erupt conventional counterterrorism measures will likely remain ineffective because they are merely reactive responses which only address the symptoms of the problem. In reality, these countermeasures may even exacerbate the situation, as Shrivastava and Mitroff

suggest, because they often involve actions that degrade the environment, destroy infrastructure, and restrict the flow of resources. Thus, these measures can further intensify resource scarcity which makes it more difficult for people to meet their basic needs and reinforces the conditions that favor terrorism.

An alternative and perhaps more effective approach to the problem is to direct efforts at alleviating conditions of resource scarcity and desperate material need, especially in at-risk regions, thus making the circumstances less conducive to terrorism. Enhancements in production might be accomplished through various appropriate conventional means, such as environmental recovery, general efficiency and sustainability improvements, infrastructure development, etc. However, these would only be temporary, stopgap measures, not permanent solutions since the overall amount of resources in the environment would continue to be depleted and eventually exhausted. This is generally not a sustainable option since the majority of the world's countries are currently experiencing scarcity of essential resources and are trending toward even higher levels in the future as the average consumption levels and population both continue to grow.

### ***Conclusion***

After nearly twenty years of extensive, costly, and destructive military operations the War on Terror has failed to eliminate or even contain terrorism, and current data reveal that this violent phenomenon is spreading and escalating toward even higher levels. At this point, no meaningful or convincing explanation has been offered for the situation, but this work attempts to provide some much needed insight into the matter. I argue that the efforts of the War on Terror have been ineffective largely because the

conventional understanding of modern terrorism, which has provided the strategic basis for the operation, is fundamentally erroneous and has resulted in misguided countermeasures.

A principal concern of this work is the current absence of any meaningful, coherent theory that adequately describes modern terrorism in terms of variables and mechanisms that can be observed and measured. While there is a general conventional understanding of terrorism, which suggests that it is a subjective political phenomenon arising from extreme emotions, views, and beliefs, this turns out to be merely an assertion that can never really be tested. This work develops a fundamental-level, scientific theory of the phenomenon which suggests that its origins lie in the primal, objective struggle to satisfy basic material needs. Terrorism is multi-faceted, but it is most accurately described as a problem of environment and population. It emerges because of an imbalance between the two and results in escalating competition and eventually violence over increasingly scarce essential resources. The characteristic condition which brings about terrorism is resource scarcity.

Those who become involved in terrorism may do so because they anticipate a vital, material benefit to themselves or their community. This helps explain their persistence and fanaticism in the face of powerful, determined opposition and why they are so willing to readily engage in extreme violence even to the point of suicide. This conception sharply contrasts the conventional explanation which asserts that terrorism is a subjective political phenomenon arising from extreme emotions, viewpoints, and beliefs. Certainly, the phenomenon takes on some of these outward features once it has emerged and developed, but they are merely symptoms not the cause.

The data reveal that higher levels of terrorist activity are generally associated

with conditions of greater resource scarcity and lower resource consumption levels. Analysis shows that resource scarcity and the number of terrorist incidents are both increasing with time and at comparable rates and that countries having lower consumption levels of resources tend to have greater terrorist activity compared to those with higher consumption levels.

These findings suggest that the resource scarcity currently unfolding across the world may be responsible for the recent escalation in terrorist activity and could encourage even higher levels in the future unless some meaningful action is taken. Conventional counterterrorism measures, such as military action, however, will likely remain ineffective and may even exacerbate the situation since they often destroy resources and infrastructure, thus exacerbate already difficult conditions. An alternative and potentially more effective approach, at least for the short-term, is to direct efforts at alleviating conditions of resource scarcity and desperate material need. This could be achieved through appropriate conventional means, such as environmental recovery, efficiency and sustainability measures, infrastructure development, etc., but it would only be a temporary, stopgap measure not a long-term solution. The unfortunate reality is that resources in the environment would continue to be drawn down and eventually exhausted. In the long-term, to effectively address terrorism far more meaningful and fundamental changes must be made to our societies so that they are in balance with the natural environment in which they exist.

In the beginning of this paper, it was noted that the U.S.'s National Strategy for Combating Terrorism (2003: 29) asserts terrorists aim to destroy civilization, but that may not actually be the case. In reality, perhaps civilization is failing to adequately perform its most basic function, to satisfy the essential material needs of human beings,

and some of the affected individuals are merely taking unconventional, extreme measures to fill them. The predicament is expressed rather well by a salient passage from Will Durant's *Story of Civilization*. Durant says (1954: 7): "*In the last analysis civilization is based upon the food supply. The cathedral and the capitol, the museum and the concert chamber, the library and the university are the facade; in the rear are the shambles.*" In the current context, the food supply is more broadly interpreted as the natural resources from the environment that are used to fill the various material needs of a society. If those needs are not met then the foundation of civilization is clearly in serious jeopardy and various existential problems may arise as a result. The shambles, of course, are where the gritty and sometimes violent struggle to survive takes place, and here we can observe terrorism's true nature: violent conflict brought about by escalating competition over diminishing resources. The conflict naturally spills over into the abstract, sophisticated realms of the facade (the political, religious, etc.) which provide it with many of its outward characteristics, such as extreme religious and ideological views, ethnic tensions, oppressive regimes, etc. Of course, they are merely the apparent symptoms of the problem and destroying them will provide no solution.

A broader implication of this work is that terrorism is a systemic issue intimately connected with a number of other serious challenges currently facing humanity that impact resource availability and the ability to satisfy our material needs, like climate change, population growth, poverty, and species extinction. In reality, terrorism is not an arbitrary or isolated problem that can be dealt with in a piecemeal fashion, as has been attempted in the past, but is a fundamental-level, systemic issue of our civilization that must be addressed through thoughtful, comprehensive, long-term measures. It is not a momentary foe that can simply be destroyed by force after it has emerged, but is a

persistent, ethereal threat that must be preempted by ensuring that conditions are unfavorable for its appearance in the first place.

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