Sustainability or invulnerable development?

Proposals for the current shift in paradigms[1]

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There can be little doubt about the impact that sustainable development is having upon research and policy in a variety of fields. Disaster studies are also being influenced by this widely held vision of development, which could dramatically shape the direction of practical efforts to reduce future calamitous events. But, before sustainable development becomes further entrenched in disaster academia, it might be wise to step back for a moment and examine this concept from a critical standpoint. Besides being a vague and fuzzy notion, the major problem with sustainable development is that it may not directly address the issue of vulnerability for disaster reduction. This having been said, I will express my concerns about the sustainability concept and then discuss an alternative or modified notion of 'invulnerable development'. I will also attempt to defend my position against possible criticisms, and then list the lessons that this paper may have for both scholars and practitioners.

Before doing so, I must emphasize that I am not arguing against sustainable development as an environmental policy. Instead, I am only raising a flag of caution due to the manner in which this notion is being applied to disaster studies. In addition, I acknowledge that sustainability and invulnerable development share similarities. There are differences between the two concepts, however, even though these might be regarded as minimal. Nonetheless, the variance may have significant implications for disaster research and mitigation, and should therefore warrant consideration.

Problems with sustainable development

As I see it, there are two central problems with the notion of sustainability as it relates to disaster.

First, sustainable development is unclear as a concept. It has been noted that definitions of sustainability are either non-existent or are numerous and imprecise (Kirkby et. al. 1995, Homberg and Sandbrook 1992), and this is certainly the case in disaster research (Berke 1995, Geiss and Kutzmark 1995, Mileti et. al. 1995, Boullé 1995, Berke et. al. 1993, McAllister 1993).[2]

As a result, scholars in the field frequently refer back to the most popular conceptualization of sustainable development, although the World Commission on Environment and Development (WCED) definition (1987) has more to do with environmental protection and little to do—if anything—with natural hazards and catastrophic events.[3]

Thus, the term sustainable development is, to my knowledge, unspecified in disaster studies. Now, it is true that such vagueness may allow flexibility in application. But, if the focus is on the environment alone, other factors are ignored, and, if the scope includes additional factors, these should be specified. Without doing so, the implementation of disaster policies may be jeopardized.

Second, sustainability may not directly attack the root of the disaster problem. There is growing evidence that disasters are not 'natural'. Instead, disasters occur only when a triggering event interacts with various forms of vulnerability. For instance, an earthquake in an uninhabited area is not a disaster, but a physical process by which tectonic plates relieve built-up stress. In contrast, an earthquake becomes disastrous when it interfaces with people who settle in hazard-prone areas or live in poorly constructed houses. Sustainable development purports to reduce disasters by stopping environmental degradation and/or by eliminating 'unsustainable' practices. If sustainability confronts the vulnerabilities created by development, it may do so partially, indirectly or perhaps by chance.

An alternate approach and its benefits

Because of the weaknesses mentioned above, I propose that disaster studies consider what can be labeled as 'invulnerable development'.

On the one hand, invulnerable development may be clearer than its sustainable counterpart. As I define it, *invulnerable development is development pursued in such a manner as to address vulnerabilities, and thereby decrease the probability that social, political and economic progress will be set back by disaster* (McEntire 1998, 216). Invulnerable development accordingly conjures up those decisions and activities that are intentionally designed and implemented[4] to reduce risk and susceptibility, and also raise resistance and resilience to disaster.

On the other hand, invulnerable development may attack the root of the disaster problem in a direct fashion. The specific goal of invulnerable development is to prevent or mitigate disasters by endeavoring to eliminate or minimize the creation of vulnerabilities during the development process, and by correcting the vulnerabilities that are carried over from past activity.

With these points in mind, invulnerable development may have 10 benefits over its sustainable counterpart:

1. Invulnerable development may be more explicit in the goals it purports to achieve. As mentioned, the purpose of invulnerable development is to: a) reduce vulnerabilities, and b) minimize the probability that progress will be hindered by triggering events. While it is true that sustainability does acknowledge that the central intent is or should be a continuation of development, it may or may not (depending upon who you read) have the specific intention of mitigating disaster.
2. Invulnerable development is also

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1. This article is adapted from a paper presented at the Natural Hazards Conference, 14 July 1999, in Boulder, Colorado.

2. Mileti (1999) provides the most comprehensive conceptualization up to date, but even his work fails to adequately defines the term 'sustainable development'.

3. The World Commission on Environment and Development asserts that sustainable development is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (1987, 43).

specific about the means used to accomplish its ends. Specifically, it reduces disasters and protects development by minimizing risk (e.g. the threat posed by natural hazards) and susceptibility (e.g. the proneness of certain individuals or groups to disaster). But, because catastrophes will always occur, invulnerable development also increases disaster resistance (e.g. the capacity to withstand destructive forces) and resilience (e.g. the ability to bounce back after a community is affected by triggering events). Sustainable development generally seeks to maintain development into the future through the conservation of natural resources or the implementation of vague 'sustainable' practices.

3. Invulnerable development summons up an important pragmatic inquiry that is pertinent to the disaster problem. It asks: 'how can vulnerability be minimized in order to reduce occurrence of disaster and safeguard the progress of development?' On the other hand, sustainability asks: 'what should be done to promote the continuation of development?' This difference, if not appreciated, could have serious consequences for disasters because 'sustainable development does not necessarily lead to safe development' (Berke 1995, 14).

4. Because of the above assertions, the concept of invulnerable development captures the plethora of disaster-inducing or disaster-intensifying variables. I have categorized these contributing factors under physical, social, cultural, political, economic, technological and development headings.

Physical variables include an accurate assessment of potential hazards, the appropriate location of people and settlements, proper construction techniques, the avoidance of further environmental degradation, and the use of structural mitigation devices.

Social variables consist of educating the public about disasters, improving the provision of health care, slowing the pace of urbanization and finding ways to reverse the marginalization of specific groups and individuals (e.g. minorities, the elderly, the disabled, women and children).

Cultural variables encompass shaping people's attitudes towards hazards and encouraging their reliance upon traditional coping mechanisms.

Political variables entail altering politicians' will to do something to confront calamity, enforcing non-structural approaches, delegating authority to facilitate decision making at the local level, decentralizing responses to disaster, and strengthening relevant government institutions.

Economic variables embrace increasing wealth, reducing poverty, dedicating a sufficient amount of resources to disaster mitigation, preparedness, response and recovery, and insuring against potential economic losses.

As I define it, invulnerable development is development pursued in such a manner as to address vulnerabilities, and thereby decrease the probability that social, political and economic progress will be set back by disaster.

Technological variables touch upon the importance of early warning systems in addition to the careful handling of modern equipment, hazardous chemicals and nuclear material.

Developmental variables involve the detailed planning of large projects aimed at improving the infrastructure as well as foresight into their consequences, in addition to the provision of disaster relief in such a way as to foster self-reliance and avoid creating relationships of dependency.

Thus, invulnerable development is comprehensive in scope, and is concerned with several variables that contribute to or resolve vulnerability. In contrast, and depending upon who you read, sustainability generally deals with environmental degradation as a disaster-inducing or intensifying variable, and may be unclear about other contributing factors.

5. By focusing on vulnerabilities, invulnerable development is related to most types of disasters, regardless of whether they are classified as natural, human-induced or hybrid in origin. Its counterpart, sustainability, is mainly concerned with disasters that result from environmental degradation. Are other disasters that result from diverse human activities (e.g. such as those that emanate from the misuse of technology) irrelevant? Again, uncertainty exists because of the differing conceptions of sustainable development.

6. Since invulnerable development is concerned with all types of variables, it also focuses on each of the four aspects of disaster management. This is because vulnerabilities may be produced or reduced through disaster mitigation, preparation, response and recovery[5]. Sustainable development is mainly concerned with mitigation (e.g. environmentally friendly practices) and, to a lesser extent, response (e.g. the provision of relief in such a way as to promote development).

7. Because it focuses on vulnerability, the invulnerable development concept may also help to integrate findings from various disciplines. For instance, physical scientists attempt to reduce vulnerabilities by spreading knowledge about the factors that make natural agents particularly destructive. Geographers attempt to reduce vulnerabilities by recommending the use or non-use of certain locations. Meteorologists attempt to reduce vulnerabilities by giving advance notice of possible weather disturbances. Engineers attempt to reduce vulnerabilities by building structures that are able to withstand and resist great strain. Anthropologists attempt to reduce vulnerabilities by exposing risky attitudes and cultural behavior. Economists attempt to reduce vulnerabilities by noting the relationship between poverty and the occurrence of disaster. And political scientists attempt to reduce vulnerabilities by showing what government policies are ineffective or even dangerous.

In this sense, invulnerable development may help unify a fragmented field. Sustainability, on the other hand, was initially espoused by environmentalists and economists, and may be somewhat bound to its initial orientation.

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4. I recognize Thomas E. Drabek for his contributions to my conceptualization of invulnerable development.

5. These steps often have unintended consequences that exacerbate the effects of disaster.

6. I agree with Frank Laird of the Graduate School of International Studies, University of Denver, about this important observation.

8. As a result of the previous assertions, invulnerable development may amount to a true disaster paradigm. The concept is explicit in its goals and means, asks questions that are pertinent to the disaster problem, captures a plethora of variables, is pertinent to all types of disasters, is related to each of the four aspects of disaster management and may help integrate findings from various disciplines. Therefore, invulnerable development identifies the general and specific areas that need to be studied, the alternative approaches and methods through which they can be examined, and the different scholars that must contribute. Sustainable development is defined imprecisely, and is therefore unclear in almost every one of these areas.

9. If invulnerable development is a more clear and appropriate disaster concept, it may simplify recommendations for those practitioners who are concerned about disaster management. This is to say, the lessons for policy makers may be more easily understood because they are more germane to the disaster problem. What is more, the comprehensiveness of invulnerable development is another reason why disaster reduction policies may become more successful. Sustainability may obscure implications for practitioners as it is imprecise as a concept and is only implicitly related to disasters. It may also hinder the reduction of disasters as it may lead to an incomplete policy guide.

10. As a result of the previous point, invulnerable development may truly help promote the worldwide effort which Blaikie et. al. propose (1994, 234-235) in order to reduce vulnerability to disasters as development proceeds. Sustainable development is mainly a lobby directed towards the conservation of natural resources for future generations. Relying on it could therefore overshadow and limit what could be achieved for disaster reduction.

Possible Criticisms and Rebuttal

Four attacks are likely to be made against the argument presented in this paper.

A first possible reaction to my concept of invulnerable development is the assertion that 'no human venture has proved resistant to failure throughout history'[6]. For instance, if the 'unsinkable' Titanic sank, if the 'effective' technology in the Union Carbide pesticide factory in Bhopal became defective, and if the impressive 'breakthroughs' in Japanese construction engineering broke down in the Kobe earthquake, why should anything—including development in the larger sense of the word—be labeled as 'invulnerable'. Past experience consequently dictates, some would argue, that the acceptance and application of my notion is utopian; it promises an undeliverable world where there are no disasters.

In response to this understandable misinterpretation of my argument, I wish to clarify my concept and then bring a similar charge against the notion of sustainable development. I assert that the term 'invulnerable development' must not be construed as a state or condition where disasters are completely eliminated from among those painful experiences known to mankind. Doing so would imply both omniscience about, and omnipotence over, physical forces, human-induced tragedies, vulnerabilities, and their interaction. I therefore affirm that invulnerable development should be regarded as a policy which may, if applied, lead us closer to the 'ideal' of a reduction in natural, man-made and hybrid calamities. In short, invulnerable development is not meant to imply a situation where disasters no longer occur, but instead suggest the means by which disasters may become fewer and less severe if they are approached in a different manner.

What is needed is a form of development that reduces disaster vulnerabilities in order to avert the reversal of social, political and economic progress.

In case this clarification is unconvincing, I wish to expose the fact that sustainable development suffers from the same drawback. An unintended implication of applying this notion to disaster is that development can be 'sustained' through environmentally friendly practices alone. While this is certainly an important component of a comprehensive disaster policy, I would reiterate that development will be jeopardized unless other factors—in addition to the environment—are also taken into consideration.

A second possible criticism of invulnerable development is that it is tautological. If, for example, vulnerability—and not a natural agent—is the sole cause of disaster, then eliminating those vulnerabilities created in the development process will necessarily reduce disaster. No other conclusion is possible. Therefore, making this argument is not only easy and predictable, but indefensible.

While this theoretical drawback is certainly evident, there is growing sentiment in the field that the above relationship between vulnerability and disasters is in fact empirically accurate (see Blaikie et. al. 1994, Cannon 1993). Hence, the tautology may deserve exoneration. If this weakness is not to be overlooked, then let me remind the reader that sustainable development also exhibits circular reasoning. For, if unsustainable practices lead to disaster, then eliminating them will inevitably result in fewer or less severe disasters. Both notions again share a similar weakness.

A third likely criticism is that the invulnerable development concept does not have the large following of sustainable development. Put differently, sustainable development may be more apt to influence disaster policies and everyday activities because it is now commonly recognized by politicians and the public at large.

It is true that this is a major challenge for the concept of invulnerable development to overcome. But it should be recalled that the notion of sustainable development may hinder disaster reduction more than it helps. This is because sustainable development downplays the issue of vulnerability. Therefore, although invulnerable development is less recognized, it may be more advantageous for scholars and practitioners in that it does not suffer from this serious weakness of the sustainable development concept.

A final possible criticism of the argument presented in this paper is that my rejection of the concept of sustainable development downplays the importance of protecting the natural environment. In other words, some may view invulnerable development as a notion which either attacks environmental conservation or ignores this important issue altogether.

If this paper is indeed generating this

perception, I wish to clearly acknowledge that environmental degradation is not only hindering the development of Third World and other countries, but is promoting disaster as well. Therefore, I agree unequivocally that environmental degradation must be addressed in any serious policy that attempts to reduce disasters and promote development. To repeat, then, my argument is obviously not that environmental issues are irrelevant, or that this form of development is not headed in the right direction as it relates to disaster. Rather, it is my conviction that *the sustainable development concept does not go far enough in addressing all of the factors that contribute to vulnerability and disaster*. It deals overwhelmingly with the environment and may only be partially related to the other areas in which humans have a contributing role in disaster. Consequently, this argument against invulnerable development is not accurate either.

Recommendations

Assuming the arguments presented in this paper are justified, five recommendations necessarily follow.

First, academics in disaster studies should use caution in borrowing foreign concepts to integrate a fragmented field and synthesize findings.

Second, disaster scholars should base the field on the knowledge that vulnerability, with its many sources, forms, and compound processes, is the root cause of disaster.

Third, academics should consider the merit of the invulnerable development concept and attempt to refine it. Fourth, practitioners are invited to apply this notion as a policy guide in order to more successfully respond to the hazardous events which affect not only the countries of the Third World, but those of the planet as a whole.

Finally, I must underscore the fact that the reduction of disasters via an alternative type of development will not be easy. For instance, technology and scientific knowledge are needed to detect risks, provide structural mitigation devices, and use hazardous materials carefully. Increasing wealth and promoting a more equitable distribution is imperative if settlement in hazardous locations is to be avoided, if the pace of urbanization is to be slowed, if the construction of building is to be improved, if health care is to reach all of those in need, and if early warning systems are to be acquired.

Changing cultural attitudes and practices is crucial if further environmental degradation is to be avoided, if social marginalisation is to be stopped, and if relief is to be more beneficial. Political support will be required if the populace is to be educated about disasters, and if the infrastructure is to be more resistant to hazardous events. Education will be essential to promote the return to traditional coping mechanisms, enforce non-structural approaches, and encourage more resources to be dedicated to disaster mitigation, preparedness, relief and recovery. Thus, a consistent and collective effort on the part of everyone will be required if disasters are to be reduced and development is to proceed.

Conclusion

To summarize, I wish to reiterate that it has not been my intent to discredit sustainable development as an environmental policy. This concept has done, and will continue to do much to reduce the depletion of natural resources and prevent the future degradation of our physical surroundings.

In this sense, sustainability does play an invaluable role for the future of development. But, as it is currently being applied to disaster studies, sustainable development is inadequate. This paper has attempted to illustrate that sustainability is unclear as an academic concept, does not directly address the root of catastrophic events and processes, and may therefore be incomplete as a disaster-reduction policy.

In my opinion, the ongoing shift away from the natural hazards paradigm will not be completed unless the relationship between vulnerability and development is more explicitly recognized.

What is needed is a form of development that reduces disaster vulnerabilities in order to avert the reversal of social, political and economic progress.

While the research and disaster management community may not choose to adopt the invulnerable development concept, it is hoped that my arguments will have at least altered the direction of the sustainable development school. To the extent that this has not occurred, the author encourages more discussion on how development can be made safer so that disasters can be reduced.

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