Defense of the Home Front in the Gaza Periphery: Examining the National Investment

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For a number of years, the civilian population in the areas adjacent to the Gaza Strip has endured ongoing short range rocket (types of Qassam) and mortar attacks on a near daily basis.

Since 2001, some 2,800 rockets have landed in the zone of communities near the Gaza Strip; of these, 950 landed in 2006 and 780 in 2007. Of all the rockets that landed in Israeli territory, half fell within the communities themselves. Within the city of Sderot, some 800 rockets have landed so far. Approximately 430 people have been injured by rocket fire (not counting victims of shock), and ten people – nine of them in Sderot – have been killed. In 2006, some 85 people were injured and two people were killed, and in 2007, about 100 were injured and two were killed. All who were killed were outside of a sheltered space at the time of their death (yard, porch, street, or car).[1] To date, a small number of standard rockets (122 mm Grad) have been fired at Israel, aimed at targets that the Qassam cannot reach. Presumably when the stockpiles of these rockets held by Palestinian organizations in the Gaza Strip grow, their use will increase, and more communities in the 20 kilometer range from the Gaza Strip will also be at risk.

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The firing of mortar bombs towards the communities near the Gaza Strip has been underway since 2006.[2] The range of the mortars is a few kilometers, which means that relatively few communities are at risk. In 2006, some twenty mortar bombs were fired at communities near the Gaza Strip, while in 2007 that number was 650. In 2006, one person was injured and two were killed by the mortar fire, and in 2007 there were seven casualties, though none were fatal.

The daily threat that over several years has beset the area creates constant pressure on the population, generates uncertainty regarding the next rocket attack, forces people to be within constant reach of a sheltered space, triggers fear and anxiety for friends and family, keeps individuals from visiting the communities that fall within the threat

range, and so on. This pressure cooker of stresses compels residents to change their patterns of behavior and imposes severe limitations on the people in the cities and towns adjacent to the Gaza Strip.

If we map the components of the threat by the extent of systemic damage they cause, it seems that the central threat against the population is not manifested by the number of people injured or killed. The more substantial threat against the Gaza-area communities regards the daily extensive duress and constraints on the population, which impact profoundly on social resilience.

In order to cope with the rocket launchings and the mortar attacks, the security establishment engages in efforts to destroy the launchers and attack their operators, reinforces and fortifies educational institutions, has decided to set aside resources to reinforce dwellings, and engages in efforts to develop systems to intercept the rockets before they land. Over the past two years, the project to reinforce educational institutions has been underway in the outlying Gaza Strip area. However, Sderot and other communities near the Gaza Strip include hundreds of private homes built during the 1970s and 1980s that lack secure rooms. As of January 2008, the government decided to set aside 50 million NIS to reinforce residential protection in communities near the Gaza Strip. In addition, there is a parallel effort to develop systems to intercept rockets before they land. On December 23, 2007, the political-security cabinet decided to allocate some 800 million NIS to develop the Iron Cap system, whose purpose is short range rocket interception.

This essay presents the levels of the response to the threat against the communities near the Gaza Strip, examines the effectiveness of the steps that have already been taken, and reviews the advisability of the measures under development.

Coping with the Threat to the Gaza Periphery

Deployment for the threat against the home front occurs on two levels: first, prevention (via deterrence, destruction of launchers and their operational and logistical systems, and rocket interception); and second, minimizing the damage when prevention has failed (early warning, reinforcement and fortification of structures).[3] Since the central threat that must be dealt with involves the pressures and constraints on the population, it is important to evaluate the effectiveness of the measures taken in the context of the specific threat.

- *Deterrence*. The fact that terrorist organizations continue to fire rockets and mor-

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tar bombs at civilian populations points to a lack of deterrence. Creating deterrence in an asymmetrical conflict between a state and a terrorist organization is complex and difficult, in part because of various constraints that a state imposes on itself in a conflict of this sort, while the limitations that terrorist organizations impose on themselves are very few. Deterrence is an important dimension in reducing the threat, and for relatively short time periods during the conflict, the security forces have succeeded in creating deterrence that brings about a ceasefire.

- *Destroying the launchers and their operational and logistical systems*. The IDF and other security forces invest much effort in locating and destroying the launchers, their operators, the operational command chain, production, and the logistical supply chain. Intensive activity has succeeded in decreasing the scope of the fire, but it is impossible to stop the fire altogether, because of difficulties in locating and destroying operations carried out clandestinely; because of the difficulty in locating the launchers; and because the launch sites are located in residential areas and therefore decrease the freedom of action in attacking them. Choosing appropriate targets at this level will reinforce deterrence.
- *Intercepting rockets*. Means of shooting down short range rockets do not currently exist in Israel's weapons arsenal. The Israeli government has decided to allocate resources for developing the Iron Cap system, whose purpose is to intercept short range rockets and thereby deal with the Qassam threat. The advisability of this weapon system is discussed below.
- *Early warning*. Early warning of attacks is the central component for damage reduction. Without early warning, there is no point in installing building reinforcements because the people will never know when to take cover. In the communities near the Gaza Strip, the siren sounding "Color Red," the early warning system activated during a rocket launch, allows the population to seek cover in a secure space before the rocket lands.
- *Building reinforcement*. Protection is an integral part of the edifices constructed in Israel. Until the 1990s this took the form of bomb shelters (in apartment buildings or in other communal areas), and from the 1990s the form of the MAMAD (secure residential space) or the MAMAK (secure floor-wide space). Since many hundreds of single family homes in Sderot and nearby communities were built in the 1970s and 1980s, they lack appropriate shelter.

The Value of Investing in Building Reinforcement

Physical means of reinforcement against rocket attacks are shelters of various kinds, which provide protection against shockwaves and shrapnel. The greatest reduction in risk occurs by the very act of leaving the street and entering a secure space of some kind (a stairwell or cover behind some kind of protective wall). Staying in a room in a dwelling further reduces the risk; the MAMAD adds to the reduction in risk, as does a bomb shelter. The contribution of additional defensive measures to a reduction in the number of casualties grows smaller and smaller, to the point at which there is no significant difference between remaining in a regular room and remaining in a MAMAD (comparable in defensive terms to a simple bomb shelter). Table 1 illustrates the risk to people based on the type of protection.

In the communities adjacent to the Gaza Strip there is an early warning system, and with the adoption of appropriate norms of

behavior during an attack, most of the residents and the people passing through the area take cover, which greatly reduces their exposure to physical harm. In January 2008, in order to increase further the percentage of people taking shelter during an alert, the Israel Broadcasting Service began to broadcast the "Silent Station," which will sound the alarm for residents. The intention is to improve the early warning system for people who are driving, who because of closed windows may not hear the Color Red siren.

The level of protection that exists at present as well as correct behavior during an attack drastically reduces the number of casualties during an attack, as compared with the potential of a rocket attack on people in an exposed area. Even today, the number of injuries by rocket attacks on dwellings is small. Thus, further reinforcing homes will represent only a marginal contribution to reducing the number of casualties.

And yet, the threat against the communities near the Gaza Strip is not expressed in numbers of casualties but rather in the day-to-day severe duress on the population. As such, it is necessary to address the way people view the severity of the threat and the level of personal protection at their disposal. A response to this particular need can occur by upgrading the protection level of homes that do not have any reinforcement at all, by designating rooms as secure residential spaces or in apartment buildings designating common spaces on each floor as floor-wide secure spaces, and adding basic security features to these spaces.

There are 10,500 homes without any kind of reinforcement within a 7 km range from the border in the zone near the Gaza Strip. Defensive alternatives range from full protection against a direct Qassam hit at a cost of 1.3 billion NIS to partial reinforcement at a cost of 250 million NIS.[5]

Value of Investment in Interception Systems

On December 23, 2007, the political-security cabinet decided to invest some 800 million NIS in developing the Iron Cap system. Sources at Rafael Advanced Defense Systems Ltd. estimate that the development process will take about two years, and that its cost will run to about 1 billion NIS. Past experience in developing complex weapon systems indicates that development time is generally much longer than planned and that costs are higher than the original estimate.

The operational concept is as follows: the system will locate the rocket launched towards Israel using acquisition radar, will follow it using a radar tracking system, and launch a missile towards it. If the system makes the assessment that the rocket is going to land in an unpopulated area, no attempt to intercept it will be made at all. The estimate is that the rate of successful interceptions of Qassams designated for interception

Table 1. Relative risk from bombs to people in residential spaces[4]

Location of people relative to risk	Relative risk (in %)
No protection in a flat, open area	100
In the street, standing	50
In the street, lying down	25
Behind a low wall (or in the entrance of a home)	17
In a regular dwelling protected from shrapnel	10
In a trench	6-10
On the lower floor of a tall, framed building	6
In a shelter (a reinforced room with protection against shrapnel)	5
In a simple bomb shelter	2.5
In a well-reinforced bomb shelter	1.25

Upgrading the physical protection of the residents' homes reduces the pressure factor and improves social resilience.

will be about 95 percent. Thus if in the course of one year 1,000 missiles are launched, and 50-70 percent of these are expected to land in populated areas, it means that despite attempts at interception, twenty-five to thirty-five rockets will still strike communities each year. If we assume that in the course of a confrontation the terrorist organizations succeed in saturating the system by launching quantities of rockets simultaneously such that the system will not be able to handle them effectively, the number of rockets striking the populated areas can be expected to be even higher. Therefore, concurrent with the interception system, it will be necessary to continue operating the early warning system and instructing the population to take cover. The fear of a rocket attack within one's community will continue to fuel the constraints on the people living near the Gaza Strip.

In order to intercept the threat directed at the population centers (and 50-70 percent of rockets launched are that threat), it would be necessary to use at least 500-700 missiles. The cost of a missile at the end of the development state is likely to reach $50,000-100,000 (200,000-400,000 NIS), so that the annual cost of the interception component alone would stand at about 100-280 million NIS. These costs do not include system development costs, purchasing the interception battery components (one Iron Cap system would supply protection for the city of Sderot, but to protect other communities more systems would be needed), training the operators, purchasing stockpiles of missiles to ensure a supply chain, and so on. The total costs would come to many billions of shekels. Costs of this magnitude would likely require a selective application of the interception system. The significance of this is that the number of missiles that would hit populated areas is liable to be higher than the initial estimate cited above. In such a case, operating the early warning system would in any case be necessary, and the consequent alleviation of the constraints on the population would not be achieved.

The defense establishment claims that these systems are of use not only in the conflict with the Palestinians but also in Hizbollah's Katyusha attacks. However, it is impractical – in terms of cost – to purchase rocket interception batteries in quantities required also to protect the northern front. The best way to reduce the duress on the population affected by Hizbollah is to reduce the duration of the conflict.

Thus, a rocket interception system will incur exorbitant costs, will not replace the other efforts to reduce the threat, and will not achieve the operational purpose required, namely, removal or significant reduction of the pressure on the population.

The Right Investment

The threat against the communities near the Gaza Strip must be assessed with a yardstick that measures the duress on the population rather than the casualties. Therefore, the policy of investing in various mechanisms to cope with the threat must be formulated on the basis of an analysis of the expected usefulness of strategies such as upgrading reinforcement of homes and rocket interception systems toward reducing the pressure on the population.

Stopping rocket fire at the settlements near the Gaza Strip is the essential answer to the threat. At first glance, it would seem that a rocket interception system is a solution in the right direction. However, the above analysis reveals that in economic terms it is unrealistic to purchase the number of batteries re-

quired, so that the system would not achieve the required operational goal of removing or reducing the pressure factor. Obliterating rocket fire entirely must be achieved by other components that constitute the levels of dealing with the threat: intensification of deterrence and destruction of the launchers and their supporting operational and logistical systems so as to suppress the Qassams.

Installation of a Color Red early warning system, the quality of current construction, and correct behavior during an attack alert have so far brought about a reduction in the number of casualties. This would ostensibly indicate that there is no need to upgrade reinforcements of homes, but the component of physical protection has the potential to change the impact of the pressure factor by changing the people's perception of the severity of the threat and of the level of their own personal protection. Given, therefore, the inadvisability of investing in a rocket interception system and the advisability of investing in an upgrade of home reinforcement in the communities near the Gaza Strip, the recommendation here is that the government halt its investment in the rocket interception system and redirect the resources at an upgrading of home protection.

Conclusion

This essay has analyzed the advisability of investing in physical protection and in a rocket interception system to address the threat leveled at the Gaza periphery. The central conclusions of the analysis are:

- The threat confronting the communities near the Gaza Strip is characterized principally by the duress and constraints imposed on the population. Threat severity is a function of the duration of the confrontation, which exacts a heavy psychological toll and impinges on social resilience.
- A system to intercept short range rockets will not result in the operational achievement required, which is a significant reduction in the impact that the pressurized environment has on the residents, and therefore investing in it is inadvisable.
- Obliterating rocket fire entirely must be achieved by intensifying deterrence and destroying the launchers and their supporting operational and logistical systems in such a way that would constitute the suppression of the Qassams.
- Upgrading the physical protection of the residents' homes reduces the pressure factor and improves social resilience.
- The suggestion herein is that the government halt its investment in the rocket interception system, and redirect the resources to an upgrading of home protection.
- When upgrading the protection, rooms should be designated as secure residential spaces, or in apartment buildings, common spaces on every floor should be designated as secure floor-wide spaces, and basic security features should be added to them.

Notes

1 The Information Center for Intelligence and Terrorism, *The Rocket Threat from the Gaza Strip 2000-2007*, November 2007.

2 Until the disengagement in 2005, mortars were fired in the direction of the Katif bloc settlements.

3 David Klein, *Home Front Defense: An Examination of the National Cost*, Memorandum No. 58, Jaffee Center for Strategic Studies, 2001.

4 A. Ratzon, *Shelter and Cover: Security Construction* (Tel Aviv: Ma'arachot, 1963).

5 Data provided by the Director of the Planning and Engineering Administration of the Ministry of Construction and Housing at a Knesset Interior Committee meeting on December 26, 2007.