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Published in:
Crime Prevention & Community Safety

DOI:
[10.1057/s41300-019-00071-9](https://doi.org/10.1057/s41300-019-00071-9)

Published: 01/09/2019

Document Version
Peer reviewed version

[Link to publication on the UWS Academic Portal](#)

Citation for published version (APA):

Smith, R. (2019). The 'Fortress Farm': articulating a new approach to redesigning 'Defensible Space' in a rural context. *Crime Prevention & Community Safety*, 21(3), 215-230. <https://doi.org/10.1057/s41300-019-00071-9>

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The ‘Fortress Farm’: Articulating a new approach to redesigning ‘Defensible Space’ in a rural context.

Abstract

This conceptual paper explores and develops a holistic, contemporary model of crime prevention namely the ‘Fortress Farm’ concept as proposed by the National Farmers Union in the United Kingdom. This novel idea is underpinned by the criminological theory of defensible space as posited by Oscar Newman, and by other theories of crime prevention. A holistic, practice-based model of crime prevention drawing on all aspects of the topic is developed and discussed in the context of preventing and deterring farm crime. This model can be adapted by individual farms or collectives to design out crime on farms. In the process, this paper advances our understanding of crime prevention both at a farm level and in a wider rural context.

“Countryside criminals are becoming more brazen and farmers are now having to continually increase security and adopt new ways of protecting their equipment. In some parts of the country, farmers are having to turn their farmyards into fortresses to protect themselves from repeated thieves who are targeting quads, tractors and power tools. They are using tracking devices on tractors, video and infra-red surveillance in their farmyards and even DNA markers to protect sheep from rustlers”.

Tim Price, NFU Spokesman (2017).

1. Introducing the ‘Fortress Farm’ and ‘Defensible Space’.

The problem with much of the crime prevention literature and media and popular opinion is that it focuses on urban-based criminality and generally ignores the rural environment (Briddell, 2009; Smith, 2010). In media depictions of farm crime, the ‘urban marauder thesis’ is often posed, whereby much rural and farm crime is portrayed as being committed solely by urban criminals (Smith, 2010). The existence of urban marauder thesis is expounded by farmers and industry interest and lobbying groups such as the National Farmers Union because it offers an identifiable common enemy – namely the traditional urban criminal and the spectre of organized crime groups. Whilst some rural crime arguably is committed by such criminals, an exaggerated urban focus leads to a situation where the involvement of industry insiders and so called ‘rogue farmers is ignored (Smith, 2004; Smith & McElwee, 2013; Somerville, Smith &

McElwee, 2015; Smith, McElwee & Somerville, 2017). In reality, rural and farm crime is committed by both types of criminal groups and therefore sustainable rural crime reduction strategies and initiatives must take cognisance of both types of criminals to be successful in reducing rural and farm crime. This is not the case in reality and clearly, a more holistic approach is required. The fortress farm concept offers the potential to deliver on this.

Traditionally, in the UK, farmers have been lax in engaging in crime prevention and crime reduction initiatives (Smith & Byrne, 2017). In former times, farm houses and outbuildings were frequently unlocked, tools were left in open view in unlocked sheds and the ignition keys for farm vehicles and tractors were often left in vehicles overnight even when parked in fields at the side of the road (see Smith & Byrne, 2017). This is possibly a result of the ‘Rural Idyll’ (Mingay, 1989) whereby because crime levels in the countryside have historically been lower than in urban areas a belief developed that rural spaces were crime free. Consequentially, farmers and rural dwellers did not lock their doors and did not fit locks to doors of workshops and tool sheds. Smith & Byrne (2017) comment on the relative scarcity of farm crime research and the perception of rural dwellers that crime is an urban problem which lulls rural communities into a false sense of security (Yarwood & Edwards 1995). In reality, rural areas, and in particular farms with low security make farms attractive targets for criminals because of the fact that there are an endless supply of tractors, diggers and other plant, quad bikes, power tools and fuel all easily accessible (NFU, 2017).

In addition, the relationship between farmers and police can be strained (Smith & Byrne, 2017) and the closure of many rural police stations (Mawby 2004; Smith & Somerville, 2013) has led to a lack of confidence in the police in some areas. The study of Smith & Byrne (2017) highlighted the low level of uptake in relation to the implementation of crime reduction measures in England and Wales and that standard locks (easy to pick by criminals) were the most common measures adopted. There was an uptake of membership of Farm watch schemes

but the success of such schemes is normally only measured by the number of active members registered and not by successes against crime. However, there is no National Register of Farm Watch, Horse Watch or Rural Watch Schemes and no academic studies specially relating to Farm Watch schemes or activities. The perception that the rural landscape is a safe haven from crime is no longer tenable due to the contemporary, inexorable rise in rural crime. Indeed, the National Farmers Union in the UK are advocating the concept of the ‘Fortress Farm’ (NFU, 2017).¹ It must however be stressed that the ‘Fortress Farm’ concept is not solely a UK based concept and that there are other similar policy development in Australia and New Zealand.

The work of Smith (2017) and Smith & Byrne (2017) in relation to Nudge theory as it pertains to the farming industry is pivotal to this paper and the ‘fortress farm’ concept because it accurately describes the current situation in the UK with its incremental and patchy incorporation of practical crime prevention interventions into farming. Indeed, Smith & Byrne (2017) argues that the 1990’s saw a large increase in urban CCTV which may have displaced crime patterns from the urban to the rural in that it has led to a generation of travelling criminals keen to exploit farms with a historically poor uptake of security and lower policing levels (as suggested by Williams et al, 2000).

Nudge Theory (Thaler & Sunstein, 2008; Smith & Byrne, 2017) is a theoretical proposition which advocates influencing behaviour by altering the context, or environment, in which people make their decisions. It operates on the principle that by addressing the social norms of a person or group of people one can influence the way that person or group think about things, and ultimately the way that they make decisions. Smith & Byrne (2017) considered why farmers are slow to adopt appropriate security measures, and how such

¹ The concept is also advocated by the UK based veterinary company Farm Skills under their FarmFortress# hashtag/banner. See the website <http://www.farmskills.co.uk/farmfortress/> for details. The concept relates to inoculating livestock against infectious diseases including BVD by biosecurity measures thereby turning your farm into a veritable fortress. Although it is tangential to the crime prevention message of this paper it is nevertheless possible to link this into the overarching farm fortress methodology.

knowledge can be used to change the group behaviour to influence farmers to protect their property. In the UK it is the National Farmers Union² which provides the impetus in terms of making farm crime a national issue and also acts as a nudge to farmers. It is the NFU Mutual annual crime figures which are accepted as an accurate indication of the scale of the problem³; and it is also the NFU as a body which lobbies other government and rural agencies in relation to rural tackling farm crime. In addition, the NFU provide support to the UK police by sponsoring rural crime detectives and analysts which work on farm theft cases.

The strength of the concept of the ‘fortress farm’ is that it puts the onus on the farmer and the farming community as a capable guardian(s) to take charge of their own security and be less reliant on the police and other law enforcement and regulatory agencies. At present, there is very little theoretical basis for the ‘fortress farm’ concept (due to its nascent stage of development and the lack of studies and publications in relation to the concept) but it nevertheless, has practical utility as a viable crime prevention strategy. Notwithstanding this, this paper begins the process of conceptualising and theorising the concept which is underpinned by the criminological theory of ‘Defensible Space’ as posited by Oscar Newman (1972/1973; Mawby, 2017). The ‘fortress’ concept is not new to the crime prevention literature but it has previously been used primarily in relation to urban crime hot spots (Ratcliffe & McCullagh, 1999; Ratcliffe, 2004). This paper addresses this lack of coverage by moving away from defensible space as an urban concept to the more rural focused ‘Fortress Farm’ concept. Nevertheless, the concept by itself is not a panacea because the NFU themselves recently reported in a bulletin headline that “*Rural crime costs up 20% despite ‘fortress farms’*”.⁴ The

² In the UK the National Farmers Union has three separate governing bodies based on geographic coverage. There is the NFU for England and Wales; the NFU Scotland; and finally the NFU for Northern Ireland. The NFU Mutual Insurance arm covers all three geographic areas.

³ However, the NFU figures do not provide a conclusive view because it does not cover any thefts or crime insurance claims made by farmers through other insurance companies. The figures are therefore incomplete and the true cost of farm crime is undoubtedly higher.

⁴ See <https://www.nfuonline.com/news/latest-news/rural-crime-costs-up-20-despite-fortress-farms/>

online article articulated that *“The cost of rural theft has risen sharply in the first half of 2017, despite some businesses ‘turning their farmyards into fortresses’”*.

This conceptual discussion paper addresses the development of an appropriate crime prevention strategy to be operationalised in rural contexts.⁵ In doing so it advances our understanding of how to develop holistic approaches to designing bespoke crime prevention strategies to prevent crime on farms. It also advances the context base in relation to rural criminology. But first it behoves us to consider the basic theoretical aspects of the crime prevention literature.

2. Developing a theoretical framework for the study.

It is necessary to first consider the theory of ‘defensible space’ (Newman, 1973; Mawby, 2017) and its related concept of ‘environmental design’ before considering the influence of crime prevention theories in relation to the former.

2.1. Introducing the theories of defensible space and environmental design

The concept and theory of ‘defensible space’ in relation to the literature of situational crime prevention was posited by Oscar Newman (Newman, 1973).⁶ The related concept of ‘Environmental Design’ is also of relevance. According to Mawby (2017), Newman’s work *“...bridged the gap between criminological theories and preventive approaches in the pre-1970s era and the more grounded and policy driven approaches that are common today”*. Newman’s work was conducted in relation to urban crime areas and has been criticised by urban planners and social scientists as lacking in methodological and theoretical robustness. These are said to undermine the imaginative nature of the theory. The essence of defensible

⁵ It is not an empirical study but is based on acknowledged practices in the UK.

⁶ It is of note that Newman was an architect and environmental planner.

space relates to an exploration of key terms such as ownership, visibility, occupancy, accessibility, image and juxtaposition that are now common currency in situational crime prevention. Newman argued that urban redevelopment with high-rise development, created public spaces that lacked both ownership and oversight and these were poorly defended and prone to becoming crime-ridden. Newman argued that in contrast to this, defensible space was safe space and that the traditional crime prevention perspective of concentrating on offences and offenders via patrolling, deterrence, punitive measures and therapy was not enough on its own. Newman's work formed the basis of what would later become the concept of Crime Prevention through Environmental Design (CPTED), also known as the Secured by Design (SBD) approach. In the UK these approaches are collectively known as 'Designing Out Crime' (Armitage 2013). Armitage (2013, 23) describes CPTED as "*The design, manipulation and management of the built environment to reduce crime and the fear of crime and to enhance sustainability through the process and application of measures at the micro (individual building/structure) and macro (neighbourhood) level*". The work of Newman later became associated with situational crime prevention as advocated by Clarke (1992). See Mawby (2017) for fuller details and a discussion on this topic.

One criticism of defensible space as a universal theory from a criminological perspective was that it was based exclusively on urban crime hot spots (Mawby, 2017). This paper therefore expands the concept to an exclusively rural area. Another criticism of the theory was that it was initially based on a study of two urban areas and rested on disputable quantitative aggregated data. The idea behind defensible space is to concentrate on high crime areas and via a package of crime prevention measures including 'target hardening' (Poyner, 1983) coupled with increased levels of guardianship (Clarke & Felson 1993) to reduce the opportunity of crime whilst designing out crime (Geason & Wilson, 1989).

Newman (1973, 50), identified 'four major categories of defensible space':

- *Territoriality*: the capacity of the physical environment to create perceived zones of territorial influence by using physical barriers such as walls and gates to create a sense of private property to which outsiders were excluded. Newman sought to create an impermeable residential environment with limited entry/exit points which were contained, monitored and controlled (Reynald & Elffers 2009, 29).
- *Surveillance*: the capacity of physical design to provide surveillance opportunities for residents and their agents. Making public areas visible from nearby dwellings (Newman 1973, 78) and cctv to reduce the fear of crime.
- *Building image*: the capacity of physical design to influence the perceptions of a project's uniqueness, isolation and status/stigma. Making the area appear well cared for and thus protected. Signs of disrepair, graffiti and vandalism indicate that such areas are not protected. Newman advocated using materials that are not easily damaged.
- *Juxtaposition*: the influence of geographical juxtaposition with so-called safe zones on the security of adjacent areas helps increase natural surveillance and policing.

Defensible space requires certain conditions – visibility, the presence of witnesses and the existence of community spirit and for private territory to be clearly demarcated, physically or symbolically. Newman's research was dependent upon recorded crime data and the vagaries of police statistics (non-reporting), processes (non-recording) and the interpretations or misinterpretation's thereof. According to Newman, manipulating the physical environment can create perceived zones of territorial influence that can deter offenders. A major flaw of this theory is that offenders are outsiders and not insiders, nor professional criminals. According to Newman isolation is attractive to offenders.

Newman in advancing his initial thesis took cognisance of the following aspects of crime prevention theory:-

- **Social crime prevention** (Cohen & Felson, 1979) which concentrates on deterring offenders and potential offenders via profiling.
- **Situational crime prevention** (Clarke, 1992) which is an empirically underpinned strategy which focuses on victims/potential victims, property or sites where crimes occur. It is influenced by routine activities theory (Felson, 1992).
- **Physical crime prevention** (Clark, 1992) which includes ‘target hardening’ via protecting particular targets to deter offenders. This can include technological innovations.

Drawing from previous theories, Mawby (2017) suggests that there are 3 reasons criminals seek when targeting an area:-

- **Surveillability:** the extent to which the premises are overseen by passers-by and neighbours.
- **Occupancy:** as suggested by the presence of a car, noise, lights etc.
- **Accessibility:** including the presence or absence of window locks, an alarm, open windows etc.

Mawby (2017) also suggests six dimensions derived from Newman’s defensible space concept:-

- *Ownership:* the extent to which the home and surrounding area are felt to belong to residents.
- *Visibility:* whether and to what extent potential crime sites are visible to residents.
- *Occupancy:* whether residents are available to see crimes should they occur.
- *Accessibility:* whether the area and residential units within it are easily accessible.
- *Image:* the extent to which image makes targets more or less attractive.
- *Juxtaposition:* whether the location of estates influences crime on the estate or close by.

In relation to ownership / guardianship, one tried and tested approach is to improve community cohesion by developing a sense of neighbourhood ownership, or collective efficacy (Sampson, Raudenbush & Earls 1997) such as Neighbourhood Watch schemes. Visibility is double edged thorny issue because thieves are attracted to what they can see and natural barriers can be used to hide targets from view. Nevertheless, one of the tenets of crime prevention is to ensure that targets are visible and ‘well lit’ and that there are no areas where thieves can work hidden from public view. Be that as it is, isolated property, and buildings that are away from main roads, secluded, remote, or near woods, parks etc. experience more break-ins (Hakim & Gaffney 1994; Mawby, 2017). This situation occurs because it relates to the lack of informal surveillance opportunities caused by the lack of neighbours. Also, rural areas are extremely difficult to surveil for the authorities because there is a lack of footfall and cover which affects the ability to hear intruders. In urban areas surveillance vans and cars can be hidden from view amongst parked cars in busy streets without attracting attention. This is not the case in rural areas where people sitting in parked cars or apparently empty van stand out. Locals quickly learn of their presence and the surveillance is rendered useless. Moreover, in relation to occupancy, whether a location is occupied or not may increase its level of vulnerability to crime. However, accessibility is a key aspect of territoriality and in particular, using design to create an impression that a space is owned by local residents, through real and symbolic barriers. The core principle of this philosophy is that of exclusion, the creation of barriers to prevent offenders/outsideers, from gaining access to housing developments, public areas, or individual homes (Mawby, 2017). One of the urban examples is that of the gated community which has physical barriers to restrict access by outsiders. Another alternative is that of ‘alleygating’ communal areas (Armitage, 2013). This is effective when used in conjunction with the private policing of access points. In terms of juxtaposition, the proximity of space in

relation to others is important because if there are neighbours within eyesight of a target it offers a level of protection. In conjunction with this there is the issue of image and impression management because a ‘well cared for’ area highlights a sense of protective pride and deters potential thieves.

2.2. Considering crime prevention theories.

It is necessary to consider the basic theories of crime prevention and how these potentially relate to the concepts of the ‘Fortress Farm’ and ‘Defensible Space’. At a practical level crime prevention and reduction strategies are interventions which are designed to either detect, deter, prevent or reduce criminal activity and reduce the likelihood of becoming a victim of crime.

From a perusal of the literature it is evident that there are several widely accepted approaches to crime prevention and these include 1) Primary Prevention techniques; 2) Secondary Prevention techniques; 3) Tertiary Crime Prevention techniques; 4) Situational crime Prevention techniques; 5) Virtual or cyber-crime prevention techniques; 6) Scientific/Technical Crime prevention techniques. See figure 1 below:-

<p>Primary Crime Prevention</p> <p>These are primarily theory based from criminology and sociological studies derived from explanations and relate to the individual and family level. These are mainly offender based. Such interventions are aimed at reducing offending rates or participation rates in crime. As most traditional crimes are associated with the criminal raised in an urban environment (Urban marauder thesis) in criminal families or brought up in criminal areas there is an immediate bias towards the urban criminal (the outsider) and thus little consideration is given to the existence of the rural (and thus insider) criminal. Early intervention techniques and strategies such as ‘Prevention First’ are both relevant examples.</p>	<p>Situational Crime Prevention</p> <p>These are programs or initiatives which deal with the geographical, environmental and physical elements associated with a particular crime hotspot or crime type.</p>
<p>Secondary Crime Prevention</p> <p>These interventions are also offender based and relate to targeting those who are at a high risk of committing crime. They deal with social and physical problems.</p>	<p>Virtual Crime Prevention</p> <p>These techniques relate to protecting the online environment from criminals i.e. from email or online frauds targeting an individual or a business from malware or viruses.</p>
<p>Tertiary Crime Prevention</p>	<p>Scientific / Technical Crime Prevention</p>

These are physical activities engaged in either after a crime has been committed or prior to then to prevent crime.	These are proprietary or products which can be used to protect or mark property to make them easily identifiable. For example - SmartWater.
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Figure 1 – six approaches in implementing crime prevention.

These six theoretical approaches can be simplified and reduced to three main ones concerning 1) Physical interventions; 2) Community and individual based interventions; and 3) Scientific-technical interventions. This forms the basis of the crime prevention framework used in this study. Moreover, from a practical perspective, for the purpose of this paper, we are less concerned with Primary crime prevention theories and interventions because these are based on highly theorised academic studies of crimes and criminals looking for patterns and as such are more likely to be the province of academics, researchers, analysts and law enforcement agencies. Such theories influence the decision-making processes of policing and law enforcement agencies and the policing strategies and crime prevention interventions they use to achieve their results. As such they will be out-with the control of the victims of crime such as farmers. At its most basic level crime prevention is very much a practice based activity.

At the heart of most crime prevention strategies (irrespective of the approach adopted) is the theoretical concept of the crime triangle (Clarke & Eck, 2003). The basic crime reduction triangle considers the matter from a criminal's perspective. See figure 2 below:

Figure 2 – The Crime Reduction Triangle.

One must take into consideration 1) the criminals desire to commit crime; 2) their ability and opportunity to commit said crime; and 3) their victim or target. The place or environment of the crime is also important and places are often managed and protected via responsible guardians. One must consider whether the offender's desire is motivated by profit (as in the case of professional and organised criminals) or whether there is some other motive compelling them to commit crime (opportunists). From a crime reduction perspective, the police must try and control the offenders by seeking to handle them (e.g. via inquiry or arrest) through the use of various laws and tactics. Simultaneously, they must manage place and places where crime is routinely committed (via increased patrols, intelligence gathering, surveillance, target hardening and proactive policing) to prevent or deter crimes (see also the work of Felson, 1986; and Poyner, 1983). The police can also act as guardians on behalf of the victims and targets. Where the traditional crime prevention triangle falls down is that it considers the perpetrators to outsider type criminals and the model clearly breaks down if the criminal is a neighbour and in particular a farmer.

3. Developing a methodological framework

As discussed above, the uptake of crime prevention measures by farmers in the UK has been patchy and farmers often require a nudge in the right direction to initiate crime prevention measures as suggested by Smith & Byrne (2017). To better visualise the above crime reduction framework and to understand how it can best be operationalised, we adapt the diagnostic model of Weisbord (1978) to present the benefits of crime prevention to farmers but integrate the

factors into the individual boxes for comparative purposes.⁷ The analytic factors in play are as follows:-

1. **Purposes:** What is the purpose of the strategy (Deter, Interdict, Prevent, or Reduce)?
In a rural context the farmers at best can seek to deter and prevent. Many farmers who have not been the subject of criminal predation still do not see the need to change their security.
2. **Structure:** How do we achieve this (individually or collectively)? Farmers are traditionally inclined to work in isolation from and in competition to other farmers and pride themselves in being considered self-sufficient. This makes acting in collectives difficult and as a result they tend to mind their own business.⁸ This could be problematic as the 'Fortress farm' concept work best when initiated collectively and geographically.
3. **Relationships:** How do we manage conflict and coordinate such activities? Is this best done manually or via technologies? As stressed above, farmers work in isolation within families and although they may have cordial relations with neighbouring farms this does not always translate into cooperation. Farmers need to identify who the local and national stakeholders are who can help them. This aspect of the framework needs to be developed.
4. **Rewards:** Is there an incentive for doing such work? Farmers who have not been subject to the attention of rural crime gangs often do not consider the consequences and as thrift is part of the acknowledged 'farmers mentality' (Smith & McElwee, 2017) they do not see the need to spend scarce money on security. More work needs done to persuade them of the cost benefits of effective crime prevention measures. Many basic

⁷ In Weisbord's original model the six boxes were as follows – 1) **Purposes:** What 'businesses' are we in? 2) **Structure:** How do we divide up the work?; 3) **Relationships:** How do we manage (coordinate) conflict among people? With our technologies? 4) **Rewards:** Is there an incentive for doing all that needs doing? 5) **Leadership:** Is someone keeping the boxes in balance? 6) **Helpful mechanisms:** Have we adequate coordinating technologies?.

⁸ Nevertheless, farmers are sociable and do help each other out reciprocally at peak times.

crime prevention techniques can be implemented by the farmers themselves from materials they already have on the farm thus saving money.

5. **Leadership/Guardianship:** Who is responsible for leading on such change and maintaining balance? Obviously the NFU has chosen to adopt an advocate's role in this area but ultimately the individual farmers have by virtue of their ownership rights to exercise a leadership role.
6. **Helpful mechanisms:** Are there adequate strategies, techniques and technologies? The basic advice is already available on line. So there is no shortage of information sources.

We adapt them to fit a crime reduction perspective and not an organisational one.

Figure 3 – The six-box model.

This framework is helpful and will be used to guide and inform the analysis.

4. Operationalising the fortress farm concept.

Smith & Byrne (2017) suggest there is a lack of academic rigour underpinning advice provided to the farming community in relation to the protection of their property and that it is often perceived as being patronising. Nevertheless, farm security is a skill which can be easily self-taught and actioned. In this section we discuss how the committed farmer can operationalise the 'fortress farm' concept by designing a bespoke crime prevention strategy for their farm and for their local farming communities. Vital aspects of this are those of ownership and territoriality. Farmers are near unique in crime prevention terms in that they either 1) own and/or manage their farms and thus have control of their domain and what happens there. This means that in crime reduction terms they are managers and capable guardians of their own territory. In farm based crime the farmer is invariably the person responsible for managing their territory and also the guardian because the farm is the target and the farmer the victim. They will be very familiar with every acre of their farm landscape and surrounding areas. Owning the land gives them certain rights and the ability to out surveillance on their land. If they own the land it makes it in effect private property. If they rent the land they may not have full powers of ownership but will still have guardianship of the land. The likelihood of the police being aware, or present is minimal given the distance to the nearest manned police station and the lack of rural police patrols. The farmer will not know the identity of the offender, nor when and where he will potentially commit crime. The farmer must either resign him/her-self to the inevitability of being a victim of crime or seek to adopt a 'fortress farm mentality'. However, this cannot protect them from insider type farm crime where the criminal is a trusted rural dweller, or even a member of the farming fraternity and as a result do not fit the expected social construction of the rural, criminal (Smith, 2010).

At its core the 'fortress farm' concept is a self-initiated strategy which places the individual farmer and their families at the centre of the strategy. It is therefore a voluntary strategy to which the farmer commits and makes it a routine activity (as per routine activities

theory – Felson, 1986). This is important because farmers are traditionally versatile and innovative and often learn many diverse skills such as welding and building etc, making them proverbial ‘jack-of-all-trades’. Farm security is just another skill set to be learnt and mastered. This entails taking cognisance of various practical aspects of crime prevention concentrating on the physical, community and technological aspects. The discussion is based upon contemporary initiatives and interventions available to farmers as reported in the UK media.

The five step plan is set out as below: -

1. Conduct a physical audit of the farm.
2. Considering physical crime prevention measures.
3. Considering community crime prevention initiatives on farms.
4. Considering technological crime prevention measures on farms:
5. Designing out crime on the farm.

Step 1 – Conduct a physical audit of the farm: At the heart of the concept lies the crime prevention audit. Most audits can be carried out for free by the Police Crime Reduction Officers. Many constabularies offer free crime prevention advice. Alternatively, one can hire a security/crime consultant. However, it is easy to do oneself by physically walking one’s boundaries and taking note of all entrances and exits and physical features of the landscape. The person conducting the audit has to consider how they would gain access if they were intending to steal items from the farm. This first step is conducted to assess the current security levels on the farm with a view to preventing access to potential criminals. It is best to start with boundaries and work inwards to the farm and farm buildings. This activity requires the farmer or security consultant to physically walk the boundaries and enclosed land looking for potential security weaknesses. The first point to bear in mind is to assess how accessible is the farm to unwanted visitors/criminals. The aim is to reduce the amount of access points to the farm,

particularly to restrict vehicular access. This is easy enough done if the farm is only accessible by one road and is not set off a long shared track.

The 'farm fortress' concept works best in farms which are closed 'occupied' units/estates in that all the land surrounds the main farm buildings/yard and has clear boundaries. It is not so easy to operationalise if the farm is spread out with other smaller farms and parcels of land spread out over an area. The business model being operated also plays a part in designing the strategy because if fields are rented across a county the fortress concept becomes less viable.

In conducting the physical audit, the farmer should consider the issue of surveillability. They have to ask themselves how easy is for thieves to watch them without being seen themselves? In rural some locations surveillability is poor because there may be no neighbours for miles. This gives potential thieves an edge. The issue of the insider criminal type is also of relevance here too. Also, some farms no longer have anyone living in the farm house which also allows potential thieves to 'case' the property unseen. Also, occupancy rates may be poor with tied houses being empty and neighbours may not have a connection to the land. Accessibility is often easy with many farmers leaving buildings unlocked. In farming terms, farms in close proximity to urban areas have a higher risk of being victims of predatory crime including low level vandalisms and fire-raising. More isolated farms do not normally suffer from this issue but may be prone to other forms of predatory crime. In this respect isolation could be a positive aspect.

Having physically walked the farm and its environs it is necessary to consider physical crime prevention measures.

Step 2 - Considering physical crime prevention on farms: This part of the audit entails considering what standard of security is in existence and taking steps to replace sub-standard fittings and fixtures. It is best to start with the farm house and any other houses on an estate

because the physical security of the person is paramount. Most houses are fitted with standard Locks/padlocks/chains/viewing ports. Whilst these are functional they do not always deter an efficient thief. Seek appropriate advice and fit heavy duty locks to all doors and windows. All doors should be locked when the house is unoccupied and after the hours of darkness. Make an inventory of all valuable possessions/antiques etc in the house including recording serial numbers and taking photographs with written descriptions of any identifying features. Thereafter ensure that all outbuildings are similarly fitted with high quality locks and padlocks. Make an inventory of all valuable possessions/tools etc in the outbuildings including photographs and descriptions of identifying features. The area surrounding the farm house should be fitted with automatic security lighting to ensure that anyone approaching the house is visible to the occupants.

Physical crime prevention methods such as alarms and improved lighting are not so effective in rural areas because there are fewer neighbours to hear the alarm or benefit from increased levels of lighting. In rural areas visibility, or surveillability, is often problematic. There is often no properties nearby and no passing footfall to see suspicious activities. There is no public space. Farm houses are often set behind farm buildings and do not always offer a view to the access road. Many farms share an access road. Privacy is assured for the farmers but this also works to the benefit of thieves. Many core farms are occupied continually all year round but outlying farms are not. Much is dependent upon the life style of the individual farmers.

The lifestyles and routine activities of farmers ensure that there are high levels of guardianship and because many farms are never vacant this reduces their chances of being victims. In rural areas second home ownership can be an issue. Farmers should make it their business to get to know the occupants of nearby houses and properties and to encourage neighbourliness and ask neighbours to let them know about any suspicious activities they see.

The image of the buildings and farm yards are of importance. In relation to preventing farm crime a tidy farm shows active management. Some farmers have crowded yards which are strewn with old tractors and machinery which tempt scrap metal thieves and offer places for hiding. Clearing up such areas is one method of demonstrating proprietorial pride. A tidy yard with CCTV, adequate lighting and all buildings locked and secured portrays a fortress mentality. If this is backed up with signage for Farm Watch and proprietary crime prevention products such as Smart Water etc then it may act as a deterrent demonstrating a high level of guardianship. Another obvious strategy is to have farm dogs who will raise the alarm when strangers appear on the farm. This sounds patronising but works well. Also consider security dogs for high value areas along with proper 'beware of the dog' signage.

Having secured the farm house and buildings it is necessary to consider other means of denying potential thieves access to the farm. In this respect gates and natural barriers are important. If there are multiple points of access to a farm from a main road consider redesigning their physical layout. If a gate is no longer necessary then remove it and install a fence. Any gates left should be fitted with anti-theft hinges and secure duty heavy padlocks. Consider fitting a security gate or barrier at the end of the main road to the farm to deter people entering the farm where it does not impede access to other houses etc. There may be right of way issues to bear in mind. If there is a known crime wave in an area consider blocking access to the road by parking a vehicle on the road at an entrance. This is a strategy used by rogue farmers to deny the authorities access to their farms at key times. However, be aware that this will also prevent the emergency services gaining access to the farm in the event of an emergency. If there are old roadways, bridleways, lanes, farm tracks or footpaths on the boundaries consider blocking these to vehicular access by placing large boulders or alternatively potato boxes filled with stones to prevent vehicles being driven onto the farm. Alternatively, large round bales may provide an effective barrier. In this way the farmer is not blocking access to horses or

walkers. Natural barriers can also be used or engineered to either make buildings visible or invisible to potential thieves. Consultation with affected stakeholders is also necessary to prevent conflict with other countryside users. However, no crime prevention strategy is infallible because other farmers will be able to identify strengths and weaknesses in other farmers security strategies.

Step 3 - Considering community crime prevention initiatives on farms: There are many established Farm Watch, Country Watch, Horse Watch and River Watch schemes covering rural areas.⁹ However, provision has traditionally been patchy. These have traditionally operated well but are dependent upon having a good liaison strategy with the police and with having an organized and committed watch secretary to run the schemes. Such schemes are an integral part of the ‘fortress farm’ concept. Traditionally maintaining interest of members was a problem if there was poor liaison with the police or a lack of information passed either way. Apathy can strike if there is no activity or foreseen benefit over time. They are well worth persevering with particularly in the digital age where ‘What’s App groups’ or other similar apps can be utilised to pass information in real time. Such schemes should actually charge a small subscription fee to enable a paid scheme manager to be installed. When combined with the ability to purchase mobile cctv cameras etc for communal use then the schemes would have more utility. Such schemes have a social side too. However, if signs are allowed to fade or are not replaced when damaged then it creates a negative impression of disrepair. There is also a school of thought that the presence of visible security measures only serves to identify that there is valuable property present.

⁹ One of the problems from an empirical perspective is that it is not possible to establish how many farm or horse watch schemes there are in the UK because each individual force area holds separate records and these are not always up to date.

In terms of crime prevention initiatives local farmers should consider forming self-help groups whereby they can help each other with fitting physical crime prevention measures for less technically able neighbouring farmers. This also applies to mastering technological crime prevention measures.

Step 4 - Considering technological crime prevention on farms: There are many technological and science based innovations in respect of farm crime prevention products. These include consideration of fitting entry alarm, boundary alarms and fuel alarms. Also in large estates automated number plate recognition systems could be fitted in conjunction with the authorities. Vehicle immobilisers and tracking devices are also of value in protecting farm vehicles and micro-chipping for farm animals. Membership of the CESAR scheme for tractors and plant is a MUST. The use of Smart water or other proprietary brands of DNA security marking is also an essential element of building up a 'fortress farm' scheme. Authorised CCTV schemes with signage are advisable for protecting farm houses and buildings. Farmers should also consider hidden cameras on entrance to their farms. These are available for wild life watching etc and offer additional security. Also, farmers could consider the use of drones to protect or check outlying land and property. The police are already using drones for rural surveillance in the fight against crime and likewise, criminals are also using drones to 'case' potential rural properties (Smith, McElwee & Somerville, 2017).

Step 5 - Designing out crime on farms: In relation to rural and farm crime taking cognizance of Newman's six dimensions is important in designing a fortress farm mentality particularly when designed with the influences of technology and lifestyle. In farming terms there is only so much can be done in relation to designing out crime because most farms are already built. It is possible to include CPTED/Secured by Design in new builds but by surveying existing

farm landscapes it should be possible to achieve results by demolishing old unused buildings which block line of sight from the farm house etc, particularly if they building has no economic value or use. The first step is to consider the farm as a built environment. Traditionally farms and their buildings evolved organically as new farming strategies and diversifications were introduced. Many farm buildings are unsecured by design with no doors or gates, thus preventing access totally is impossible. There is ample scope to use a wide range of defensible space strategies and tactics including - a sense of ownership; territoriality; access control; surveillance; target hardening; image and activity support (Armitage, 2013). This will require working with CPTED aware architects, police architectural liaison officers and DOCOs (Designing Out Crime Officers) to design fortress farm features into 'new build' farms. In many parts of England and Wales individual forces are offering free crime prevention surveys to farmers and those living in a rural area. This is a welcome initiative. Whilst many existing farms are difficult to self-police there is scope for designing out crime by repositioning roadways and tracks to the farm to make approaching them more difficult because of line of sight issues. Also, farm buildings and sheds which are no longer in use or are dilapidated should be removed to improve the overall image of the care and adherence to security taken on the farm. Any old abandoned machinery should be removed and scrapped to create a more secured impression and to prevent opportunities for metal theft. It is important to make use of any appropriate signage so that potential criminals who enter farms are instantly aware that they have entered an area covered by guard dogs, CCTV, farm watch and that property is security marked and protected by tracking devices and Smart Water. This will no doubt only displace them but by a combination of target hardening and securing by design will provide a greater level of protection. There may be a place for 'Fortress Farm' Signage too.

5. Discussion and conclusions

Although the 'Fortress Farm' concept is still a nascent idea it has huge potential and its purpose is clear. By implementing and practising 'Nudge Theory' (Thaler & Sunstein, 2008; Smith & Byrne, 2017) the NFU and other stakeholders such as the police have an opportunity to influence and thus alter the context, or environment, in which their decisions are operationalised for the common good. By implementing the stage based, model presented above they can positively address the social norms of the farming and rural communities in respect of how they think about crime prevention and creating defensible spaces. All that is required is for a concentrated effort from all stakeholders to put robust structures in place to support its proliferation. The stakeholders must work hard to build cohesive and supporting relationships and helpful mechanisms in place which help farmers protect themselves and their industry. It is up to farmers to embrace the leadership opportunity. The rewards will then become self-evident. It is apparent that the 'Fortress Farm' mentality is slowly changing attitudes in the farming community and that this will continue whilst the current rural crime wave continues unabated. The annual NFU crime statistics suggest that this is a likely scenario. One option is to maintain the status quo and let industry market forces and crime trends find their own levels. However, it would be more efficient to try and accelerate the pace of implementation of the 'Fortress Farm' and 'Defensible Space' concepts. It is incumbent upon all stakeholders to adopt the following recommendations which were generated during this research project:-

Recommendation 1: There is a pressing need to draft a Nationwide Rural Crime Strategy to cover England, Wales, Scotland and Northern Ireland. This should be divided into operational policing matters in conjunction with crime reduction strategies. The strategy should include bodies such as the NFU. The strategy should standardise the delivery of policing services in the UK.

Recommendation 2: The local Police services in England and Wales need to work more closely with the National Forces in Scotland and Northern Ireland to create a seamless operational plan. This could be achieved by the creation of regional hubs in England and Wales. At present, not all English forces have a rural crime reduction strategy or action plan. However, there is evidence of Forces combining to create regional rural crime task forces. In England and Wales this should include the local crime commissioners. This should include an information sharing protocol.

Recommendation 3: There is a pressing need to create a National Register of Neighbourhood Watch Schemes to include details of farm watch and horse watch schemes so that intelligence on crime patterns and sightings can be shared more effectively in real time. This would enable examples of good practice to be shared because not all schemes are effective, and it often depends on the enthusiasm and efficacy of the individual watch coordinators. The implementation of this recommendation would enable the collection and collation of useful statistics on what works and what does not.

Recommendation 4: The ‘Farm Fortress’ concept could be operationalised via the design of an APP with instructions and advice on how to complete an audit and on how to access crime reduction advice and appropriate security products.

Recommendation 5: There is a need for central government to finance and develop the innovative models of assisting rural crime prevention such as sponsoring detectives and analysts skilled in rural crime prevention as piloted by the NFU.

Recommendation 6: There is a case for expanding the remit of existing Farm Watch schemes into cooperatives or self-help groups whereby farmers with experience and skills in farm crime prevention can band together in geographic areas to help each other. This could be facilitated by charging a levy so that specialist equipment can be purchased and used collectively.

Implementing these recommendations would go a long way towards ‘nudging’ rural crime reduction strategies into the 21st century. There is also the potential for more private sector involvement and consultancy opportunities in relation to rural policing and crime prevention.

This paper makes a contribution to the crime prevention and rural crime literatures by highlighting the existence of the nascent ‘Fortress Farm’ concept and by beginning the academic discussion of this important topic to crime prevention. The paper also advances the literature on CPTED and situational crime prevention etc because it is about agricultural operations as businesses. It adds value despite only being a preliminary discussion of the fortress farm concept as applied to large acreage businesses such as farms. However, there is an urgent need to conduct more empirically based research into defensible space in rural areas and into rural crime and offending patterns. According to Mawby (2017) some of the components of defensible space, and situational crime prevention may cancel out others or lead to conflicts of interest. Mawby (2017) warns that (in an urban context) crime is not prevented through the construction of fortresses but nevertheless adopting a fortress mentality may be a feasible crime prevention strategy in a rural context particularly in areas of high crime. Mawby stresses that it is also necessary to consider how to reduce crimes by residents/insiders as well as crimes by outsiders. Social inclusion is seen as the key. Therefore, farmers need to get to know all rural residents in their vicinity. Likewise, Smith & Byrne (2017) argue that simply adopting crime prevention measures may not be enough to stop victimisation. They call for a change in culture, routine, thought processes and decision making. We nevertheless argue that the ‘Fortress Farm’ concept offers a viable new holistically based practical crime prevention strategy to tackle farm crime. However, it only tackles predatory crime by so called ‘Urban Mauraders’ and not industry insiders.

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