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**SEC: A**

**QUIZ: 2**

Q2: What are the impacts of highways and buildings on agricultural lands?

### **Introduction:**

Between 1998 and 2007, Pakistan lost 19.23 percent of its agricultural land. One over the same time period, the construction of the interstate highway system led to a period of suburbanization during which city boundaries and suburban areas expanded onto agricultural land. The loss of agricultural land directly reduces positive environmental benefits, including storm water management, recharging of water aquifers, open space preservation, and air purification. Agricultural land that is converted into residential suburban development, or urban sprawl, also carries negative externalities including urban core decay, air and water pollution, and inequality

### **Body:**

Highway construction has accelerated urban growth and induced direct and indirect changes to land use. Although many studies have analyzed the relationship between highway construction and local development, relatively less attention has been paid to clarifying the various impacts of highways associated with farmland loss. This integrates spatial analysis, remote sensing, buffer analysis and landscape metrics to analyze the landscape pattern change induced by direct and indirect highway impacts. This explores the interaction between the impact of highways and farmland loss, using the case of the highly urbanized traffic hubs in Pakistan. Our results demonstrate that the experienced extensive highway construction with a clear acceleration of expressway development. This unprecedented highway construction has directly fragmented the regional landscape and indirectly disturbed the regional landscape by attracting a large amount of built-up land transition from farmland during the last two decades. In the highway-effect zone, serious farmland loss initially occurred in the urban region and then spread to the rural region. Moreover, they found the discontinuous expansion of built-up land scattered the farmland in the rural region and expressway-effect zone. Furthermore, farmland protection policies in the 1990s had the effect of controlling the total area of farmland loss. However, the cohesive farmland structure was still fragmented by the direct and indirect impacts of highway construction. They suggest that an overall farmland protection system should be established to enhance spatial control and mitigate the adverse impacts caused by highway construction. This work improves the understanding of regional sustainable

development, and provides a scientific basis for balanced urban development with farmland protection in decision-making processes.

An increasing number of buildings are being built as a result of the rebuilding of stations with the development of land readjustment and buildings along stations in Fukuoka city. Areas along railway tracks have thus changed rapidly. Recently, residential areas have gradually appeared in the center of the city, despite the tendency of resident to transfer to the suburbs. Furthermore, modern society still develops around public traffic; peripheral urban development centers on train stations are thus expected to become increasingly important to city planning centered on public traffic in an environmental society. With the development of large-scale retailers and specialty stores, the shutter streets of shopping streets have become increasingly serious. A shutter street is a street with various branch shops and closed-down shops or offices. Such areas used to form a busy shopping district with the taste of a “commercial town”, but with the shops closing down, the area is now mostly residential.