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LONG ABSTRACT

Title: Can urban gardens contribute to food self-sufficiency in mountain areas at risk of food desertification at times of Covid-19?

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Regional Economics, regional planning, food security

Long Abstract:

This presentation tests the contribution of urban gardens cultivation to the food self-sufficiency of mountain municipalities at risk of food desertification at times of Covid-19.

Food deserts, that is places where residents lack nearby supermarkets, have received increasing attention from academics, policymakers, and activists in recent years (e.g., Sadler et al., 2016; De Master & Daniels, 2019; Gilbert, 2019). Suffering from depopulation, some mountain areas are at risk to become "a desert". Multiple factors influence food availability locally: high production and transportation costs, terrain and climate conditions, and depopulation. As such, solutions to prevent food desertification have been more challenging to operationalize in these territories (Rodriguez & Maraj Grahame, 2016). The popular policy response is to establish new supermarkets (Eckert '& Shetty, 2016). However, this solution could be unprofitable in these territories due to their geographical specificities (e.g., remoteness, morphological features, etc.) and some objective factors of disadvantage (e.g., depopulation, limited transport infrastructure and services, etc.) (Laner et al., 2019; Tani et al., 2020).

Mountain areas are at risk of food desertification. Due to depopulation, food sales facilities close or relocate to more populated and distant areas. As a result, the local population has increasing difficulties in accessing food, and is therefore vulnerable to social injustice. The restrictions imposed on personal mobility to reduce Covid-19 diffusion have aggravated these difficulties, especially for those living in a municipality without any food sales facilities.

Yet, communities who live in food deserts may already have their own well-adapted strategies to access food. Urban gardens might be some of these (Tong et al., 2011; Brinkley et al., 2017).

Urban gardens are plots of land gardened collectively by a group of people (generally, elderly or voluntary associations for the recovery of disadvantaged people or pupils and students in schools) in public lands under municipal regulation or in private ones. Their cultivation contributes to social and urban requalification as it increases social integration of people at risk of exclusion (elderly people, above all) and reduces the anthropic pressure on natural resources (soil in particular) (e.g., Shostak & Guscott, 2017; Rogge et al., 2018; Schreiber & Carius, 2016, Kim et al., 2020). This practice also contributes to access to healthy, affordable food and aligns with the gardeners´ cultural and ethical values as well as to develop of healthier dietary patterns and thus potentially reducing health risks (Diekmann et al., 2018; Garcia et al., 2018).

Intuitively, urban gardens can be considered as useful initiatives to address problems concerning food desertification. Being both producers and consumers at the same time, gardeners shorten the food chain and appear less dependent on traditional distribution channels for food supply (Campbell, 2012).

Despite the role in reducing the risk of food desertification, knowledge of their spatial patterns of urban gardens and their contribution to the reduction of food desertification in mountain areas is still lacking (McCormack et al., 2010; Wang et al., 2014; Cattivelli, 2020a). This scarce interest for these practices locally is because residents cultivate their own gardens and do not have interest for other forms of cultivation; or because markets´ farmers and supermarkets are relatively accessible also in these territories (Cattivelli, 2020a).

However, the spread of Covid-19 has strongly re-proposed the theme of food desertification as a problem in these areas. The restrictions imposed by the local and national governments to contain the spread of the virus include the obligation to stay at home, move only within one´s own municipality, and leave only for serious reasons. Although food-purchasing is included in these reasons, law enforcement controls or fear of contagion could demotivate people to go out. This has created discomfort especially in remote mountain communities where there are no supermarkets or other organized forms of food supply.

South Tyrol is a mountain and remote province in North Italy, with evident geographical specificities (e.g., morphological and climate features) (Schlögel, et al., 2020) and some objective factors of disadvantage (e.g., depopulation throughout the territory, except for some urban centers, increased human pressure on natural resources) (Vampa & Scantamburlo, 2020). For some years, the province has been experiencing an increasing interest in sustainable food production and chains. As a result, some South Tyrolean municipalities have encouraged urban gardening projects (Cattivelli, 2020b). Even in this territory, the Covid-19 virus has spread, and the provincial administration has adopted restrictive measures to contain it. In line with the decisions of the national government, it has limited the circulation within only the municipality of residence and for and for health and work reasons. This has made it difficult to get food, especially for those who live in food deserts in remote and mountainous municipalities without food facilities.

The study underlying this paper has a twofold objective. The first objective is to develop a model to calculate the food requirements of mountain municipalities with urban gardens in South Tyrol and the necessary land for food self-sufficiency based on demographic data, agronomic information on the most cultivated crops (rotation, required land, climate conditions) and dietary needs for age. The second objective of this paper is to quantify the contribution of urban gardens to local food self-sufficiency. Based on the results obtained, it hypothesizes how much the extension of these gardens

covers the necessary land for food self-sufficiency at municipal level compares the results with the contribution of local agricultural land area (SAU). Calculation is then performed considering only the contribution to the necessary land for fruit and vegetable production self-sufficiency, as these products are the most largely cultivated in urban gardens.

The remainder of this presentation proceeds as follows. The second moment profiles the phenomenon of food desertification and the risk of its diffusion due to the mobility restrictions imposed to limit Covid-19 contagion. This moment also underlines the possible role in its mitigation played by the cultivation of urban gardens. The third moment details the possible effects of this practice in mountainous areas to reduce the risk of food desertification. The fourth moment describes South Tyrol as case study, while the following one describes the model adopted in the present study to test locally the food self-sufficiency. The next one calculates this sufficiency for all South Tyrolean municipalities with urban gardens and compares data related to the contribution of municipal agricultural areas and urban gardens. Finally, the last ones draw the discussion and the conclusions.

With reference to the result, this presentation shows the functioning of a model for calculating the food self-sufficiency of the South Tyrolean municipalities with urban gardens and comparing the relative value with the data related to extend of the necessary land, urban gardens, and agricultural land at municipal level. This model is specifically tested for these municipalities that are currently affecting by a progressive transformation of their food production and distribution paradigm due to the increased risk of food desertification and the effects of Covid-19 mobility restrictions. There is much uncertainty about access to food-supply spaces, due to the mobility restrictions in contrast to the pandemic diffusion and emerging food desert above all in mountain areas. This situation pushes for urgent transition towards sustainable, accessible and more-locally food systems. As such, the model can be a useful instrument for food planning, the evaluation of food print and land suitability, in addition to the community's food self-sufficiency. Its main strength lies in having a framework that merge all phases of food chain and it is territorial-based as it considers immediately the morphological and climatic characteristics of the place where it is implemented.

Results of its application suggest the need of reconsidering interventions in food production as well as in design, site and organization of the food distribution model. Suggestions refer to the re-organisation of distribution channels for local food production, above all towards Bolzano, the main urban center in the province, while other smaller municipalities demonstrate values closer to the self-sufficiency. Parcines, Vadena, Silandro, among the smallest municipalities, are closer to this independency. The contribution of urban gardens to the self-sufficiency is almost zero. The results demonstrate that urban gardens' contribution to local food self-sufficiency is almost irrelevant and less than 1% of the municipal needs. The agricultural areas contribute more than urban gardens to self-sufficiency, producing food for the about 50% of municipal needs. Data related to the contribution of urban gardens to the necessary land for fruit and vegetable production for self-sufficiency confirm the limited extent of their relevance.

In other terms, urban gardens are not alternative in the mitigation of the negative effects of food deserts. This perspective may be detrimental as it lacks knowledge of other possibilities, including those that build upon existing resources, which may be essential in the everyday life of the residents. Lessons recently learned demonstrate in this paper room for improvement local farming in agricultural land areas at municipal level, as

well as re-organization of food production supply, also implementing social innovation strategies. Further research would focus on testing this model to more urbanized areas and measuring neighborhoods' access to food provision initiatives, including urban gardens, also through econometric analysis.

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