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Articles

Homegardening as an Option in War-Affected Syria: A Mini Review of Homegardening and Its Potential to Promote Sustainability

Bshar Samir Bdoor ^{a,*}

^a Higher Institute for Environmental Research, Tishreen University, Lattakia, Syria

Abstract

The war and the economic sanctions imposed on Syria have resulted in economic hardship. In this context, the review on homegardens of this study provides an insight of the potential role that homegardens can play to reduce the economic burdens, improve environmental quality and cope with sustainable development objectives. The review highlights the serious lack of data on homegardens in Syria and emphasizes the need to conduct extensive research on Syrian homegardening and its optimization. The benefits of homegardening mentioned in this review present some real reasons for promoting homegardening wherever feasible in the country.

Keywords: Syria, war, homegardening, agroforestry, sustainable development, food security.

1. Introduction

Homegardens are agroforestry systems, shrub and herbaceous species are usually associated with livestock and managed deliberately by household labour (Fernandes, Nair, 1986). Many researchers studied homegardens, each for different goals and from different angles, and that is why there are many definitions of homegardens. However, typically, these systems are established in close proximity to households and have well-defined boundaries (Hoogerbrugge, Fresco, 1993). Having anciently evolved as a result of gradual cropping intensification in correspondence to the increased human pressure and reduced cultivable lands, homegardening is believed to be the oldest land use practice second only to shifting cultivation (Kumar, Nair, 2004). Most of the homegardens in the world are in Asia (Hoogerbrugge, Fresco, 1993), and for centuries, they have changed the life of millions of people by providing means for subsistence and sometimes means for prosperity (Nair, 2001). Torquebiau (1992) noted that homegardens have the potential to combine the main elements of sustainability i.e. production and conservation. War and economic sanctions have significant impacts on the three pillars of balanced sustainability: economic, environmental, and social. UN Mission (2013) reported that Syrian agricultural sector is subjected to massive destruction and huge losses in different arenas because of the war and the sanctions imposed on the country. According to the report, it is hard for the Syrian people to cope with the dramatic devastation of irrigation system and other agricultural infrastructure that severely affected the

* Corresponding author

E-mail addresses: bsharbdooor@yahoo.com (B. Samir Bdoor)

production of major Syrian crops and livestock. Hence, the intention of the present review is to derive a possible common conception from literature regarding the implications of adopting homegardening strategy in Syria on both the economic and ecological dimensions of sustainability.

2. Discussion

Homegardening: Ecological Dimension

Biological storage of carbon is an ecosystem service that has an important role in climate change mitigation policies (Davies et al., 2011). Intensive agricultural practices have provided more food but at a cost of many ecosystem services including CO₂ sequestration (Tilman et al., 2002). Modern agriculture was found to be contributing to the elevation of the atmospheric CO₂ concentration through reducing carbon inputs and increasing carbon losses from the soil (Paustian et al., 1997). Generally, agroforestry was found to have an important role in carbon sequestration because of its considerable potential in storing carbon in various tree species and soil (Montagnini, Nair, 2004). Mattsson et al. (2013) reported the storage of significant amount of carbon in above-ground biomass pool of homegardens. Substantial amount of carbon is stored in agroforestry systems as compared with other non-forest land use (Palm et al., 2000; Kirby, Potvin, 2007; Henry et al., 2009; Bdoor, 2018). Described as “oases of carbon” in a degraded karst landscape, homegarden land use was found to have the potential to store substantial amount of carbon per unit area in its above-ground biomass pool comparable to that of a disturbed forest (Bdoor, 2018). Besides their direct contribution as potential carbon sinks, agroforestry systems can enhance carbon sequestration by lessening the pressure on forests. In any case, the way the agroforestry systems are managed determines their capacity as carbon sinks (Montagnini, Nair, 2004). Different agricultural practices such as cropping of annuals, growing perennials, or animal farming lead to significantly different carbon sequestration (Dale, Polasky, 2007). Carbon stocks can be increased significantly by shifting from lower-biomass land use systems (e.g., permanent shrub lands, agricultural fallows and grasslands) to tree-based systems (Roshetko et al., 2007). Moreover, it is believed that perennialization generally leads to wider range of goods and services (Asbjornsen et al., 2013). In addition to their potential in climate change mitigation, homegardens can promote climate resilience at the local level; for example, through strengthen farmer seed systems (Sthapit et al., 2010). Agroforestry systems are looked at as an option that combines both climate change adaptation and mitigation (Murthy et al., 2013). Besides increasing carbon stock, agroforestry also have the potential to reduce soil erosion (Tilman et al., 2002). Murthy et al. (2013) pointed out some of the other environmental benefits of agroforestry to be: improved soil fertility; reduced insect pests and associated diseases; moderated microclimates; better utilization of solar energy; and enhanced biodiversity.

Homegardens are microenvironments possess genetic, agronomic, and cultural diversities (Watson, Eyzaguirre, 2002). Homegardens can be the sources of great diversity of food and medical plants (Chambers, Momsen, 2007). Kumar and Nair (2006) argued that homegarden agrobiodiversity is generally a result of socio-economic and ecological factors and farmers' choice, which is usually based on expected services. Homegarden land use has the potential to conserve plant diversity (Gajaseni, Gajaseni, 1999; Wezel, Bender, 2003; Kehlenbeck, 2007), even on a degraded landscape (Bdoor, 2017).

Homegardening: Economic Dimension

Production of food is believed to be the main function of most of the homegardens (Nair, 2004). Homegardens are traditional land use of marginal input (Hoogerbrugge, Fresco, 1993) that has the potential to improve food security (Talukder et al., 2000; Chadha, Oluoch, 2003; Yiridoe, Anchirinah, 2005; Bdoor, 2017). Homegardening supply households with diverse fresh foods that improve nutrients available to the family on both quantity and quality levels (Marsh, 1998). Imbruce (2007) considered homegardening to be a sort of “alternative agriculture” that has strong connections with conventional agriculture. The traditional knowledge accumulated through homegardening makes homegardens perform like reliable test labs for selecting better performance species (Watson, Eyzaguirre, 2002; Alhamidi et al., 2003). Despite the fact that conventional agriculture provides more profits with higher returns per unit of monetary or energy input as compared to traditional agroforestry, it does not match the latter regarding sustainability and compatibility with environment (Nautiyal et al., 1998). The composition and structure of

homegardens help in reducing resource deterioration that is usually one of the side effects of conventional agriculture (Nair, 2004).

Maikhuri and Ramakrishnan (1990) studied homegarden system in a village in northeast India and found the system to be highly efficient in energy and economic terms. Moreover, homegarden system was considered to be an important land use especially in areas where shifting cultivation is widely practiced, as homegardens can provide an alternative income and therefore reduce the dependence on shifting cultivation (Ramakrishnan et al., 1992). For many households, savings in food and medical expenses along with income derived from sale of surplus plant and animal products make up a substantial share of total income (Marsh, 1998).

Homegarden land use is a time-tested system (Nair, 2001) that can positively contribute to sustainable livelihood as it improves food quality, and enhance social, political, and financial status (Mitchell, Hanstad, 2004). Marsh (1998) listed the potential economic benefits of homegardening to be: Higher returns to land and labour as compared to field agriculture; source of income and fresh food; source of fodder, fuel-wood and hand-crafted items; year-round food availability and additional income through processing plant produce; the easy engagement of the income-poor in the activity; and strengthening women by providing a source of independent income. Homegardening has the potential to meet many of farmers' needs without imposing negative consequences on the resource base. In fact, it is likely to have positive impact on the resources besides improving various ecological, economic and social conditions (Torquebiau, 1992) and therefore promote sustainable livelihood.

Homegardening: The Case of Syria

Syria is located in southwest Asia, on the eastern coast of the Mediterranean Sea, and hence the country has a Mediterranean influenced climate. The area of the country is about 185,180 km². Farming and cattle breeding appeared for the first time in the world in Syria where it was the Centre of the Neolithic culture (Jaghayef et al., 2016). There is, accordingly, no wonder that agriculture sector in Syria is of special status. The sector is considered as one of the primary driving forces of the Syrian economy (Ali, 2010).

The multiyear drought (2006-2011) in Syria caused food insecurity for more than one million people and increased unemployment (Gleick, 2014). Following the drought disaster, a catastrophic war was erupted in Syria. Besides resulting in unprecedented humanitarian situation, the war is reversing Syria's development progress and leading to a development challenge that is the largest of our time (UNDP, 2015). It gets worse. The sanctions imposed on Syria by part of the international community have further weakened food and agriculture sectors. For instance, the sanctions are hampering the importation of the animal feed and veterinary drugs, and therefore compromising the survival of the Syrian livestock (UN Mission, 2013). Actually, the sanctions have undeniable effect on all aspects of Syrian economic performance and on the livelihoods of the Syrian poor in particular (Nasser et al., 2013). Sanctions, severe economic recession, greatly weakened national currency, rising prices for goods and services, and disrupted markets have contributed to exposing the Syrians to suffering (UNDP, 2016).

Syria has population amounting to 20 million people, about 6 million of which are food insecure and in need of food assistance (FAO, 2018). Pregnant and nursing women in Syria are at high risk of malnutrition because of the hike in food prices and limited accessibility to fresh food such as vegetables and dairy. A nutrition survey conducted in 2015 and 2016 showed that anaemia is widespread among both children under the age of five and women with a prevalence of 25.9 % and 24.5 % respectively (Kern, 2017). In order to treat malnutrition in Syria, community-based management programmes is found to be very critical (Tull, 2017). Homegardens can greatly enhance both food security and health status of households in developing countries (Yiridoe, Anchirinah, 2005). Actually, homegardening might be one of the "last frontiers" in the battle against hunger and malnutrition (Ninez, 1985).

The relationship between women and homegardening is well established. Women were found to play principal role in maintaining homegardens in different countries around the world (Marsh, 1998; Talukder et al., 2000; Finerman, Sackett, 2003; Vogl, Vogl-Lukasser, 2003; Mitchell, Hanstad, 2004; Ibnouf, 2009), including Syria (Galié, 2013). Syrian women are participating in agricultural activities and their role was increasing before the crisis. FAO (2011) noted that in Syria, female share of economically active population in agriculture increased from 31.7 % in 1980 to

60.7 % in 2010. Hence, even with the relatively high number of Syrian men involved in military activities, the success of homegardening programmes, those may rely heavily on women labour, is still anticipated.

Boyd et al. (2007) noted that small-scale CDM A/R (Clean Development Mechanism, Afforestation and Reforestation) projects such as agroforestry can enhance the livelihood among the low income rural communities. Considering that about 46 % of the Syrian population lives in rural areas (UN Mission, 2013), Syrian homegardening projects would be beneficial. In addition, homegardening is not only suited for rural areas, Sanyal (1985) described homegardening in urban areas with limited financial resources as an innovative response by the urban poor. In Zaire, a result of the civil and economic crisis during the last two decades of the twentieth century was the expansion of urban farming. It was found that during times of economic and political crises, private vacant or abandoned land in Africa was converted to a sort of farming systems (Smit et al., 2001).

Even if the economic sanctions lifted and the war ended now, the humanitarian crisis in Syria would remain for quite some time. There is some evidence that the multi-year drought that started in the mid-2000s in Syria is an indicator of expected climatic changes for the area (Gleick, 2014). According to all scientific projections, the Mediterranean is among the regions of the world where temperature will keep rising and rainfall diminishing throughout the coming decades (IPCC, 2013). The current situation in Syria is characterized with high levels of food insecurity (Tull, 2017) and undermined resilience capacities of households (UNOCHA, 2016; Calvet-Mir et al., 2012) noted that besides promoting food security, homegardens can enhance community resilience to environmental conditions.

Investing in sustainable solutions is the option that can enhance stability in Syria (UNDP, 2015). Homegardens that are well adapted to local circumstances represent a sustainable strategy that the unfortunate can enter without difficulty (Marsh, 1998). However, since the income-poor tend to have poor homegardens (Seeth et al., 1998), assisting them in establishing and optimizing their homegardens is needed. Successful homegardening projects can be found around the globe. Bangladesh homegardening programme resulted in providing micronutrient-rich foods to the households (Talukder et al., 2000). Omohundro (1985) described homegardening in the North Atlantic to be a survival strategies and recommended that governments should promote homegardening. As one of the options to enhance food security for the poor, (Marsh, 1998) noted that homegardening should be part of national strategy of food security. Understanding the traditional gardening system is critical in the success of homegardening projects (Chakraborty, Basu, 2018). In projects that promote homegardening it is very important not to replace the plants used by the people by marketable plants and to maintain homegarden diversity which would provide food security (Soekartadiredja, Ramlan, 2015). In addition, involving the poor in deciding how to optimize homegardens is fundamental for the success of a homegardening strategy (Mitchell, Hanstad, 2004). In 2016, the Syria Ministry of Agriculture and Agrarian Reform launched a pilot project to support family farming in selected households in some villages of five Syrian governorates. The outcome of the project has not yet been concluded. Although homegarden land use can offer multiple services, Syrian homegarden land use was neglected in agronomic and economic research. Only few studies were conducted on Syrian homegardens. Kywan (2016) compiled a checklist of Syria's cultivated plants and reported that many of the medical plants were cultivated in homegardens and used mainly for preparing traditional medicines in poor areas. Kywan (2016) noted that homegarden is an important location in Syria for conserving plant genetic resources particularly species that are neglected from research or economically under-utilized. For a countryside near Damascus, Alhamidi et al. (2003) explored the links between farmers' non-materialistic culture on the sustainability of their traditional farming systems/gardens and found that religion played a role in determining some of the tree species. Alhamidi et al. (2003) noted that farmers were engaged in diverse crop production to overcome the consequences of possible low prices on one or more types of their crops. No economic and agro-ecological studies were found at the scale of Syrian homegardens. The lack of comprehensive data on homegardens in Syria was not surprising, Vogl and Vogl-Lukasser (2003) highlighted similar lack in non-tropical climates. Comprehensive study of the indigenous agroecosystems which are highly site-specific systems is very important for insuring sustainable development (Chandra et al., 2011). The ecological benefits and other ecosystem values provided by homegardens necessitate conducting scientific researches on their potentials and optimization (Nair, 2001).

3. Conclusion

This review illustrates that homegardening can provide several economic and agro-ecological services that contribute to sustainable livelihoods, making homegardening especially relevant to a war-affected country such as Syria. Homegardening contributes to household food and nutritional security and can be an important part of the national food security strategy. Probing literature about Syrian agroforestry revealed that although homegarden land use constitute a part of the Syrian agricultural setup, it has been neglected in the economic and agro-ecological research. Qualitative and quantitative studies on the present status of Syrian homegardens, their optimization, and the costs and benefits of adopting homegardening strategy would be important.

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