



Development of rural communities and food security in Iran based on agroecological farming methods

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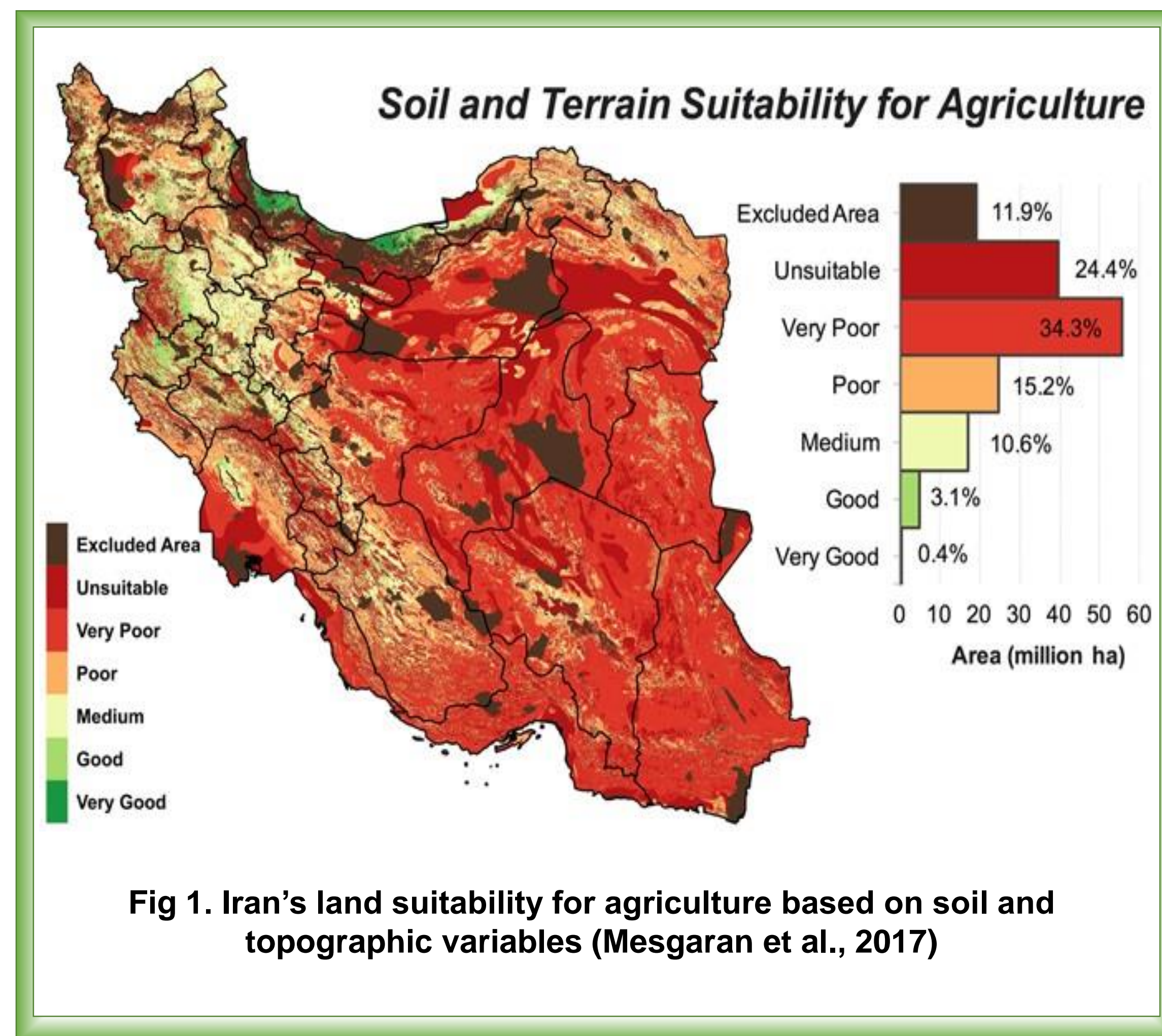
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Introduction

Iran, with more than 60,000 villages in different climates, has a high potential to benefit from various agroecological methods. Many villages in Iran are in unfavorable environmental, economic and social conditions, which has led to the migration of villagers to cities, food insecurity, land degradation, deforestation, etc. The spatial distribution of agricultural suitability classes shows that the vast majority of lands in the center, east and southeast of Iran have a low potential for agriculture, irrespective of water availability and other climate variables (Fig.1). Due to the lack of water resources and adequate agricultural land in Iran, therefore, agricultural systems need to be redesigned in Iran. As an alternative for the design of land use systems, agroecology is often discussed in science and many of its methods are studied in detail (Krebs & Bach, 2018). Therefore, by using various agroecological methods, these problems can be overcome to some extent.



Agroecological methods

Agroecology consists of a variety of environmentally friendly farming methods that can produce crops or livestock without harming natural ecosystems (Fig 2.):

- ❖ Permaculture
- ❖ Multiple cultivation
- ❖ Mixed farming
- ❖ Agricultural forestry
- ❖ Crop rotation
- ❖ Agroecological village method

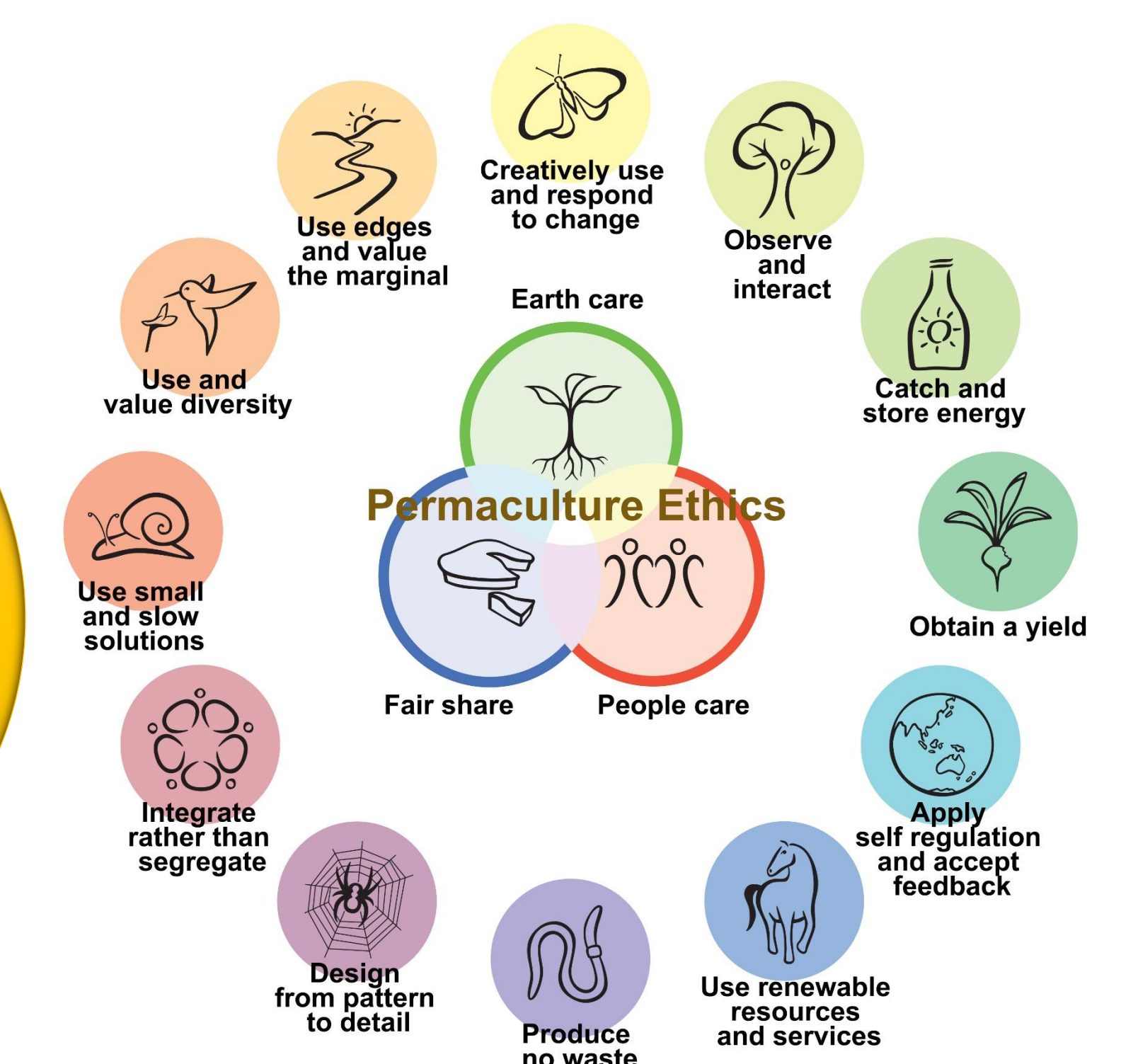


Fig 3. Permaculture is a whole-systems design approach characterized by specific principles and ethics. (Holmgren, 2020; Essence of permaculture. Hepburn: Holmgren Design Services. Revised Edition. Mellodora Publishing. <https://holmgren.com.au/>)

Fig 2. Agroecological farming methods

Conclusions

Food security is one of the most important issues we face every day. Misuse of natural resources inevitably puts us on the path of global degradation. The documents show that mankind has long exceeded the environmental capacity of the earth in all its dimensions, i.e., in terms of soil, water, and the environment. The highest priority now is to look for systems that consume few inputs but have many outputs so that nature can continue its flow. Ecological agriculture, which is based on knowledge, indigenous knowledge, environmental justice, and health, addresses all of the shortcomings listed for conventional agriculture. Food production system vulnerability should be addressed through local solutions, innovations, and agro-ecological methods. Agroecology is the study, design, and management of sustainable agriculture using ecological sciences. The principles of agroecology state that one should adapt to the local environment and its strengths, opportunities, and limitations. It is necessary to create the right conditions in the soil in order to encourage the growth of plants and the recycling of nutrients. It means that by increasing biodiversity so that it can be applied in the agroecosystem system over time and in different places, it is possible to continue the production of crops, trees and livestock together and uniformly. We must increase the ecological and biological responses and productivity of the entire agricultural system, and finally, we must minimize water and soil erosion. In agroecology, people's rights to access their resources, i.e. land, water, seeds, and territories, are recognized. Agroecology believes that it is necessary to rely on local methods and local knowledge in order to achieve food security. In agroecology, linear systems in production where, for example, water and food turn into sewage, or fuel turns into pollution in the air, must be changed to a cyclical system in order to reach a balance in gaining benefits, that is, products are produced and consumed locally. Considering the limitations of water and soil, the increase in crop production in Iran should be realized through the use of sustainable agricultural methods. In this way, the correct use of limited agricultural land, improving the efficiency of water consumption, optimizing the distribution of the product pattern, and adopting modern cultivation methods considering biodiversity are of vital importance for Iran.