

Changing the attitude to production in agriculture is a necessity

Introduction

One of the principles of food security in the world is to increase the efficiency of using existing resources and turning threats into opportunities. Today, in many countries of the world, it is believed that there should be a resurgence of marginal land because the capability of the lands to provide world food has fallen or even reached a dead end. If food production is supposed to change in the future, it should increase production per unit area or increase the area under cultivation. Scientifically, almost none of these two scenarios can create a new revolution. On the one hand, it is no longer possible to increase the crop area and, on the other hand, the genetic capacity of the species is limited and there is no possibility to increase the harvest index. So the question is, what should we do with the increase in the population ahead? Perhaps the best solution is to reduce pressure from high-quality lands and turning to marginal lands, although changing diet and reducing the length of the food chains can also be a new strategy. For example, Iran's wheat dryland yields is less than 700kg, while this amount can be doubled on condition of proper management. The importance of this issue becomes apparent when it comes to the fact that around 70 percent of the some country's land, such as Iran, are drylands and there is a wonderful opportunity to increase the possibility of producing more secretive revolution. If these lands are not managed, farmers will leave the land due to their lack of economic justification, and as a result these lands will become marginal lands.

Some examples of potential opportunities

Sloped lands are one of these threats. Therefore, there should be new solutions to save these lands. It is important for a farmer to have an economic income; therefore alternative methods for farmers should meet this important and undeniable goal. For instance, wood farming is one of the issues that should be given special attention to save the sloped lands. Moreover, the potential of trees in wood production in many marginal lands can have a favorable economic income, while reducing the harvesting pressure of forests and consequently reducing deforestation. In addition to preserving soil from erosion, it significantly reduces the need for tillage, and the use of chemical inputs, and, apart from the early years of planting, it will require little water to maintain it. This industry will bring higher income to farmers and will play an important role in strengthening rural communities. Definitely, the choice of suitable and fast growing tree species along with high industrial value will be crucial to the success of this kind of agriculture. The cultivation of medicinal plants along with the extraction and processing industries of these crops and their by-products can also be very effective in arid and semi-arid areas as a solution to save the marginal lands. Successful examples of this change can be seen in saffron fields of Iran, as it is now a wonderful alternative for many high water consuming crops and has now become a valuable opportunity for farmers in arid and semi-arid regions. This plant has enabled the farmers to preserve water and soil resources and obtain higher income.

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The development of greenhouses (by the scientific methods) is another strategy and example that can be planned to produce more crop per water drop. The best areas for developing such industry are those regions with high radiation and optimum temperature (i.e. areas that do not require high inputs for cooling, heating and ventilation). A successful example of such a pattern can be seen in Almeria, Spain. Changing cropping patterns is also among the policies that should be prioritized to fulfill this purpose. The successful example of this pattern could be seen in the cactus cultivation in many deserts of the world. These cactuses are cultivated with various goals (such as providing a new food source, industrial, pharmaceutical and other purposes). An example of this is the use of *Opuntia* species in production of natural food dye which generates huge income annually for farmers in some countries.

Strategies to go ahead

Therefore, it seems that the first step that needs to be taken to optimize the production situation in agriculture is to change the attitude of farmers towards the issue of production. In some areas, in general, agricultural activities must be stopped and should change land use (for example, conversion of agricultural lands to shrimp pools in the some parts of Golestan province, northern Iran). In some regions, also, they have to change the cropping patterns and crop types. For this, land use planning should be done to all agricultural lands and then economic analyzes should be performed. Of course, one should not forget that the proposed model should not have adverse social and environmental consequences. Therefore, turning threats into opportunities is one of the promising approaches to ensuring food security in the forthcoming situation. For this purpose, land management units (LUM) have to be defined and determined after land use planning. LUMs are, in fact, fragments of land that have the same characteristics in terms of their suitability, topology, and soil-related traits. Determining the LMUs help us to direct and unify managements, but LMUs boundary determination needs spatial-based data that can be generated using ground control points and interpolation methods or satellite imagery-based raster layers (new tools for creating new horizons). Therefore, in the future, in addition to changing the attitude to production in the world, it is necessary to look for intelligent and spatial-based managements so that resources

can be used optimally. This process requires three stages of land use planning, agro-ecological zoning and cropping pattern design, each with its own processes. In the first step, we determine that agriculture is right or not, in the second step we say which crops are permitted and what each region is capable of producing each crop, and in the third step we say that the selected crops are planted at what LMUs. In this method, we maximize the efficiency of resource use, which will provide conditions for the conversion of marginal lands to the main production lands.

Therefore, it seems that in future, land suitability maps should be determined and new plants should be introduced to agro-ecosystems,

and new strategies must be based on the identification of new opportunities and to overcome threats. In this regard, drylands in arid and semi-arid areas will have a special place and will provide plenty of opportunities for further production.

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Conflicts of interest

The author declares that there is no conflict of interest.