

TRANSLATE CHALLENGE AS AN OPPORTUNITY: VISUALIZING OPTIONS OF SUSTAINABLE
AGRICULTURE IN SEMI-ARID AREA OF TURKEY

Erhan Akça¹, Kume Takashi², Hikmet Bozaklı³, Shizue Miura⁴

¹Adıyaman University, Vocational School of Technical Sciences, 02040 Adıyaman, Turkey

²Ehime University, Matsuyama City, 790-8566 Ehime, Japan

³Karapınar Agricultural Chamber, Karapınar, 42400 Konya, Turkey

⁴Istanbul University, Faculty of Letters, 34459 İstanbul, Turkey

ABSTRACT

Amalgamating or integrating needs of society and scientific endeavors is the biggest challenge of 21st century. Prior to 21st century, public demands and pressure on natural resources did not considered as a threat to environment and human health even acknowledged as development. However, activities including agriculture caused catastrophic results all around the globe. Science, then shifted from its “development oriented aim” to “sustainable oriented goals”. This paradigm shift of science created serious conflicts between society and itself. Particularly agricultural activities mostly based on economic basics rather than environmental priorities, demanded high input of agrochemicals and irrigation along with tillage for cultivating cash crops which all tools (chemical fertilizers, pesticides, large capacity irrigation pumps, irrigation equipment, tractors etc) are introduced by science. But, alike irrigation, new techniques (?) enabled semi-arid and arid land farmers to triple even quadruple increases in agricultural production. The excess use of agro-tools induced salinity built-up, loss of plant nutrients from soil profile, erosion and ultimately desertification. For example 6000 m³ groundwater is pumped for irrigation at every second from 100.000 groundwater wells in Konya Basin (C. Turkey) from April to Late August for irrigating ever thirsty maize, sugar beet, alfalfa and potatoes. All stakeholders in Konya Basin aware of this problem but no common solution has been set due to varying expectations ie farmers do not want to lose their income, politicians do not want to lose public support, governmental officers do not want to lose their position, scientists do not except alternative measures presented by other stakeholders. Moreover, farmers are generally reluctant to implement environmental protection measures without compensation (Posthumus et al. 2011).

Scientist in 1970s initiated projects by omitting local demands by merely thinking nature. Barbed wired areas were established for conserving nature. However, humans did not support this approach and generally trespass these areas (Figure 1).



Figure 1. Erosion control area in Karapınar, C. Turkey invaded by shepherds

Recent approaches which integrate human dimension to conservation by considering local values fruit promising results (Egan et al. 2011). This kind of approach at first needs paradigm shift of scientists orthodox beliefs which may be achieved by integrating to the target society. Along with natural properties cultural and traditional values should be absorbed by the scientists. The goals of the projects, such as less water use without losing income, will be realized by modification of local and proven land use managements other than theory based solutions. The challenge in Karapınar is to establish a land management for reduce groundwater use which induce sinkhole formation (Figure 2).



Figure 2. Sinkhole formation in Seyit Hacı Village, Karapınar, C. Turkey

In Karapınar, with 10 to 12 irrigation, 13.5 tons of maize can be produced. The net income of maize per hectare as of 2014 is 3.030 USD. Whereas, 15 ton/ha traditional melon for pickle making (Figure 3) may be produced with 2-3 irrigation. The net income as of 2014 is 20.300 USD/ha. As a scientist, it is not needed to inform farmer that melon use less water than maize, the crucial point is to inform farmer that no economic loss will happen following less water demanding melon since farmers are driven by economic values.

Farmers although aware of high income from melon, they complain about high labor demand of melon production. Also, the total of 140.000ha arable land cannot be converted to melon cultivation. But, farmers' do not like crop pattern plans alike sugar beet quota. They overcome this quota by purchasing poor farmers' sugar beet cultivation permission or registering idle land for sugar beet production although they cultivate in owned lands.

Another option for sustaining high income of farmers' is animal husbandry in Karapınar where is famous for its rich fodder flora in Turkey. But, overgrazing in 1960s almost converted Karapınar to desert, and following 30 years of mitigation studies cultivation and sheep breeding became feasible in Karapınar because animal husbandry in Karapınar depends on carrying capacity of natural grasslands which are hosting more than 40 fodder plants. Initially grasslands should be seeded with natural plant species for increasing meat and dairy quality of sheep.



Figure 3. Melon for pickle making

Thus, instead of repeating unsuccessful project approaches in Karapınar, traditional income tools which are proven to be successful for society's economic activities for millennia should be modified by the participation of stakeholders' views and demands. This may be only achievable by regular meetings and workshops since stakeholders are complaining about one-time events during various projects ie they want to keep the issues hot. The regular meetings let people to understand different stakeholders' approaches that may be amalgamated in a melting pot for satisfaction of all members of the society by securing common understanding for designing future of the society itself.

References

- Egan, D, Hjerpe, EE. and Abrams, J (Eds). 2011. Human Dimensions of Ecological Restoration: Integrating Science, Nature, and Culture. Island Press. 410 P.
- Posthumus, H, Deeks, LK, Rickson, RJ. and Quinton, JN. 2013. Costs and benefits of erosion control measures in the UK. Soil Use and Management. DOI: 10.1111/sum.12057