

To my dear friend Prof. Werner Kvarda for his passionate devotion to the problem of soil use and its destiny in the modern times, prepared on the basis of my presentation at the Linz workshop (Nov.2008.), as an idea with no scientific argumentation

The Soil Use Pentagon

The soil is increasingly and almost dramatically attracting attention, not only of scientists but of common people too, especially where this natural element is crucial factor of development. The soil is progressively increasing interest among agro-producers on one hand side but also among investors with their greenfield investment ideas on the other side. For former ones it is matter of their existence and for later ones it is subject of profit making, still cheap and easy to afford, not forgetting the fact that existence and profit could be mutually dependent. The ambivalent meaning and use of the soil is dramatically appearing during the period of transition in the countries where the new value system has not been established properly and where greenfield investments are booming, with people in rural hinterlands oriented to shifting from poor agriculture in former times to some new activities hopefully bringing fresh finances nowadays. The obvious situation in transitional societies is illustrated by harsh attacks to the soil (greenfields) by liberal market forces, confronted with societal framework with no proper value system, weak legislative instruments and usually corruptive administration. In such a socio-economic context the soil is practically victim of new economies. Two cases are of particular interest in transitional societies: (a) the case in surroundings of big cities and (b) the case in mountainous rural areas.

The big city is a kind of focal point to people coming from poor rural areas to settle and work there, and to investors coming to developing regions with financial and political capacities. The local authorities and land owners (agricultural land around cities) are urgently trying to use the given chance for either newcomers to build their new home (usually illegally) or greenfield investors to make their objects (factories, warehouses, services, etc) or just to buy cheap, underused agricultural land for land speculations. The soil sealing in such situations is progressively increasing due to the simple reason that agriculture in such areas does not pay off and the city administration has other priorities far from agriculture. On the other hand greenfield investment pays off in the short-term period with disastrous long-term consequences to soil, not only on the spot but to wider eco-systems also.

The rural mountainous areas are generally inhabited by people with weak financial capacities, with tremendous demographic disturbances and disbalances where aged, unskilled and uneducated people dominate. In such areas people use their small economies for activities connected to the soil (orchards, husbandry, small scale corn or wheat producing, vegetables for local markets, etc) and deem their land ownership rights as absolute. They have no program to support them, develop or enhance their production but organize their activities in traditional way, usually along brooks or small lakes, without proper know-how, technologies or organization. The soil erosion, land slides and water pollution are usual consequences, without any care or control on the side of local authorities and with powerful investors not interested to come there.

Summarizing both cases the common denominators, or key factors for the soil use problems in transitional societies, could be recognized:

- **People**, not aware of the soil functioning, sensitivity and importance. To them soil is nothing but an instrument to use according to their needs, a mean for money making or media for accomplishing their individual or family objectives;
- **Land ownership**, understood as absolute right, where the soil is treated according to the will of owners to use, to build, to sell or to destroy. The legal instruments are

rather weak to enhance the soil use, but also far from idea that protecting soil in public interest should be in line with protecting water or minerals as public goods.

- **Economy (market)**, where trade-off between investors and owners, with administration (planners included) in between, is satisfying short-term appetites while long-term perspectives are left to future generations with investments constructed and the soil destructed (unsustainable approach)
- **Local administration**, in many cases ignorant and not responsible on the soil importance, occupied with development projects, changing spatial or town plans in concordance with investment ideas, even interpreting legal acts in terms of agricultural land classes in the *lessez faire* mode, just to realize short-term effects.
- **Soil**, as a victim of the new dynamism and lack of proper understanding of its multifunctionality, eco-structure and substantial importance for the future of climate, food production or water capacity.

These five key-factors and their mutual and interdependent relations form the dynamic system of soil use. Any of the factors produces positive or negative impact to others (flows) resulting with dynamic state of any factor (levels). The system is dynamic, changeable, complex, rational (tangible) and partially irrational (intangible) due to partially irrational nature of human behaviour. The size and importance of these five factors should be comparable but not equal. Some of the factors are more important and have stronger impact in the system and some are less important, depending on the concrete regional or national situation. Specific and different situations should be recognized and measured with different approaches in any case. Importance of any factor depends on priorities in specific areas with questions like these in sequel:

- Shall we keep people staying in small mountainous hamlets with their poor economies based on the traditional soil use or pay more attention to natural systems and their protection?
- Is economy offered by big investors priority within city territory or the soil should be protected as such?
- Whether administration should give priority to protecting soil for the future or use it for attracting investors and their sealing ideas?
- Is the soil matter of use for individual developmental ideas or should be more controlled as a matter of public interest?
- Is the soil generally **allowed** to be used for construction according to planning regulations or generally **forbiden** to be used for construction except where plan allows it?, etc.

The relations between single factors are constant, mutual and interdependent, making a flexible system, permanently changing but always making closed system with five angles – a **pentagon**.

1. The starting angle is made out of the relation between **soil** and **people**. Soil is given by the nature and people use it in different ways, with more or less of know-how and control. People as dominant and rational beings use the soil, and using it they change it, cultivate it, pollute it, change its functionality, diversity, sell and buy it and even destroy it. As more people use it as less the soil keeps its capacity, quality and quantity. As less the soil preserve its capacity, quality or quantity, as less people will be able to use it. Quantity and physical quality of people directly depends on quantity and quality of soil and vice versa, the quality (biodiversity) and quantity of soil directly depends on the behaviour of people, how they use, misuse or abuse it. The soil is renewable in terms of quality (long term rehabilitation) but not in terms of quantity after sealing, erosion, etc. Both are dependent on rational behaviour but

people are irrational beings too. Rationality of the soil use depends on consciousness, awareness, education, culture, tradition and that complicates its control.

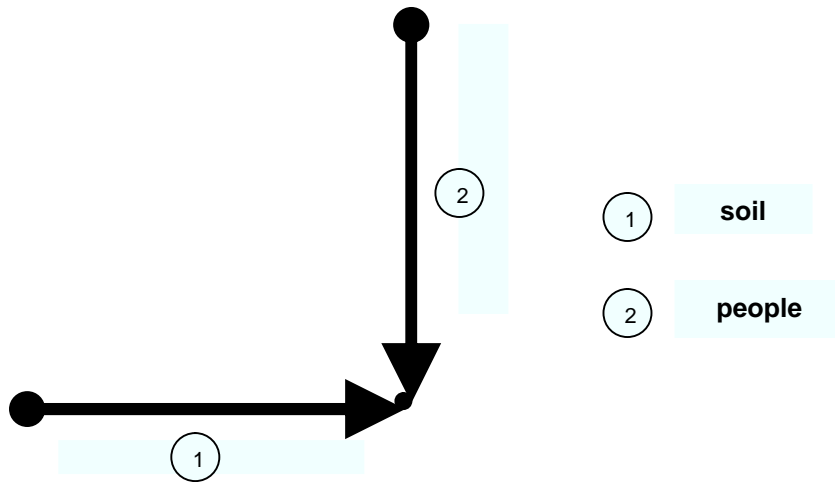
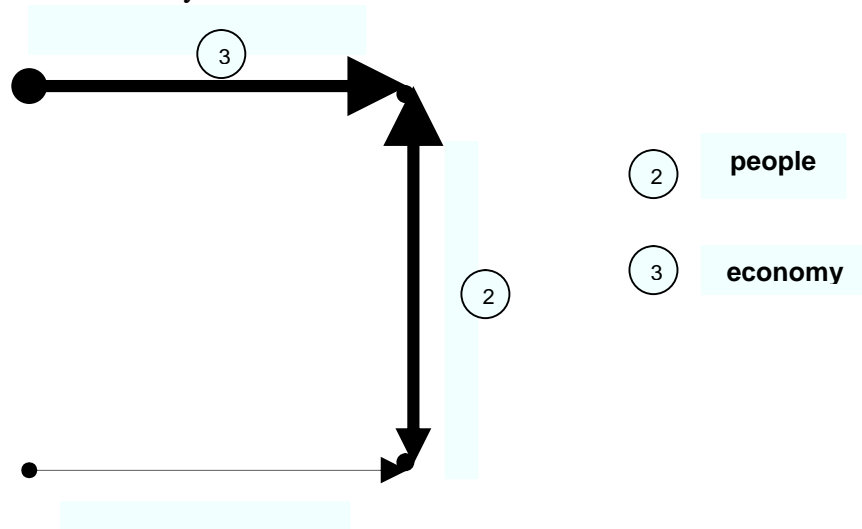


Fig.1 The soil attracts people

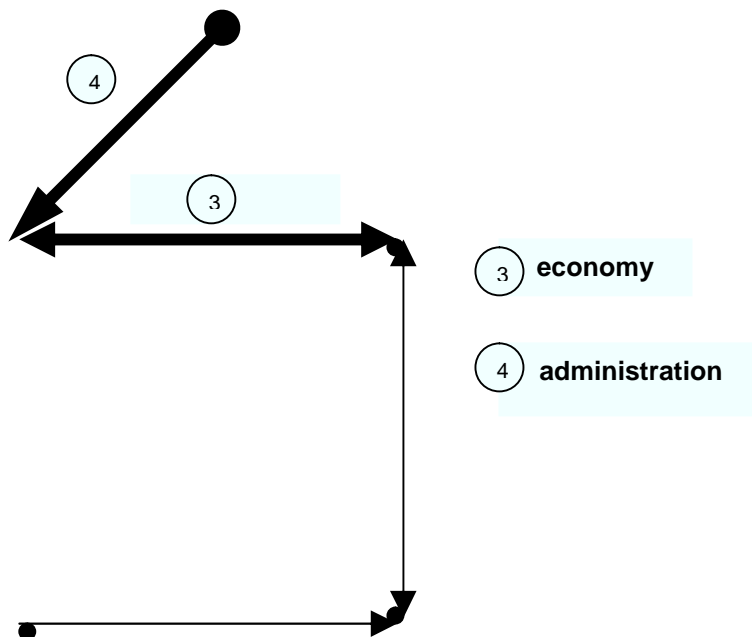
2. The next angle is the one between **people** and **economy**. People are laborious and mobilize their activities using different resources to develop. The nature is offering their resources with the soil as one of capital importance. Some of the resources are limited and nonrenewable and some are without limits and renewable. Developing their activities, using the resources, they increase or decrease their economy. If resources are affordable in ample quantity and reliable quality the economy will get developed. Developing economy is attracting people and increasing their quantity and demographic quality (young and skilled people). To the opposite, if economy is stagnating or decaying people will leave the area, looking for employment and financial means. Unattractive area will have low demographic quality (aged and unskilled people). In both cases, developed or undeveloped economy, the soil is one of crucial reasons for the situation and for demographic processes. Therefore the long-term planning of economy development has to seriously take into account availability and quality of resources with the soil as crucial for food production, water system availability, biodiversity and multifunctionality.

Fig. 2 People generate economy



3. Further, the angle is evident between **economy** and **administration**. Administration on state, regional or local tiers is responsible for development but also for protecting natural resources and controlling their use. As for the soil the state is preparing and adopting legislative framework and national strategies for development of economy and nature protection. National spatial development strategies are defining a comprehensive concept with goals and objectives and strategic priorities for both. Consequently the state is organizing national institutions to take care of economy and investments, but also for nature protection and the use of natural resources, the soil as one among them. The law on agricultural land could be one of the most important. The state is implementing its legislative and strategies by regional administration and their jurisdiction in terms of economic development and the nature protection. The lowest tier, i.e. local administration is usually responsible for urban planning and for small scale economy developing with initiatives and incentives to attract investors and to raise capacity for economic and social development, with regulations relating to nature and landscape control. The good governance of the three tiers understands proper vertical and horizontal coordination and, as one of primary consequences, good and sustainable economy will emerge. To the opposite, bad governance means lack of coordination between tiers and horizontally between economy and ecology. Grabbing for money, local government will attract investors but destroy resources, and soil as one of the most attacked by greenfield investments. The same could happen if region or state, in the phase of transition and urgent need to raise financial capacities, define their strategies uncoordinated or with dominant advantage given to unsustainable economy or infrastructure making. The soil will be always the first victim if sectors do not coordinate or if general strategy or legislative do not pay attention to regional particularities in terms of soil quantity, quality or specific way of use.

Fig 3. Economy develops administration



4. Finally, the critical angle could be registered between **administration** and **land ownership**. The land ownership is old and highly effective matter, administered by any kind of national administration, by law and other legal instruments. Some of these have long tradition (more than 500 years in Sweden), some are more or less restrictive and some have different approach to so called *land use*. The conflict in practicing or implementing laws could appear in inadequate understanding and coordinating two ideas: land and soil. The land has given right to get owned and used, and the soil has given right to get used. The land could be in private or state ownership with the attribute of public good if administration decides it by the means of planning instruments (land use control). Privately owned land does not mean right of owner to do whatever owner wants with the soil and that is administered by agricultural land legislative. But the scale of using ownership rights are different in different states: from absolute one (ownership as sacrosanct right) to highly relative one (ownership of land strictly controlled in terms of soil use). Depending on soil use regulations and their correspondence to land use control, and also understanding the difference between land and soil in spatial or urban planning, the destiny of soil will be more or less sustainable in transitional societies. If the private land use right is understood and practiced as absolute soil use right the soil destiny will be negative. If the soil use right is practiced as part of public interest and consequently controlled through prudent land use administering the soil destiny could expect more positive effects in the future.

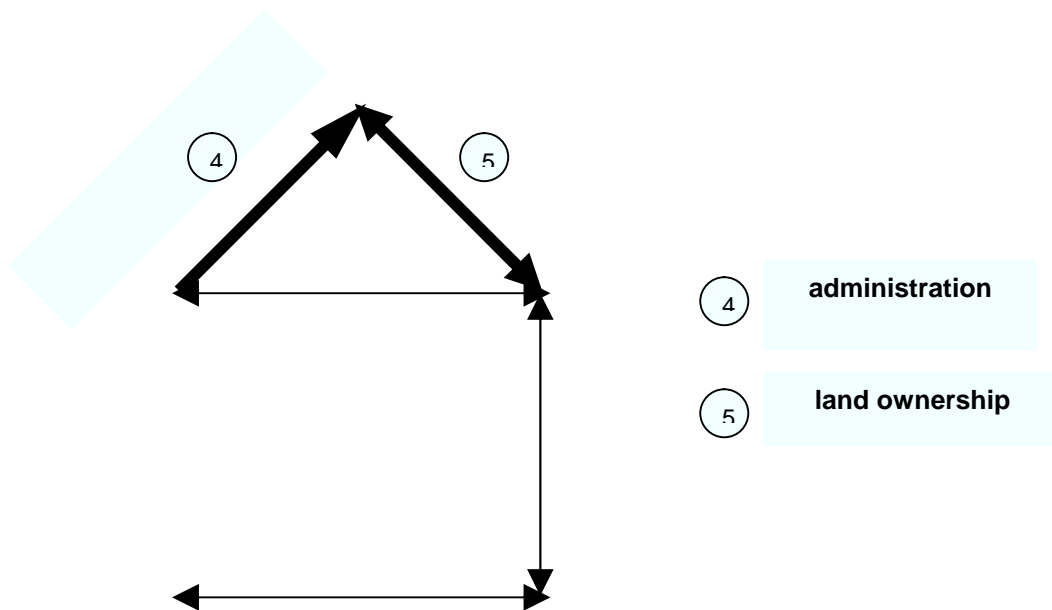


Fig 4. Administration protects and control land ownership

If we get back to the starting point, the soil as the crucial part of the nature system, with its biodiversity and multifunctionality as the critical prerequisite to human benefit, the soil use pentagon could be treated as an attempt to better understanding of eco-eco dynamism between the nature and economy, with human being as mediator and can be treated between the two.

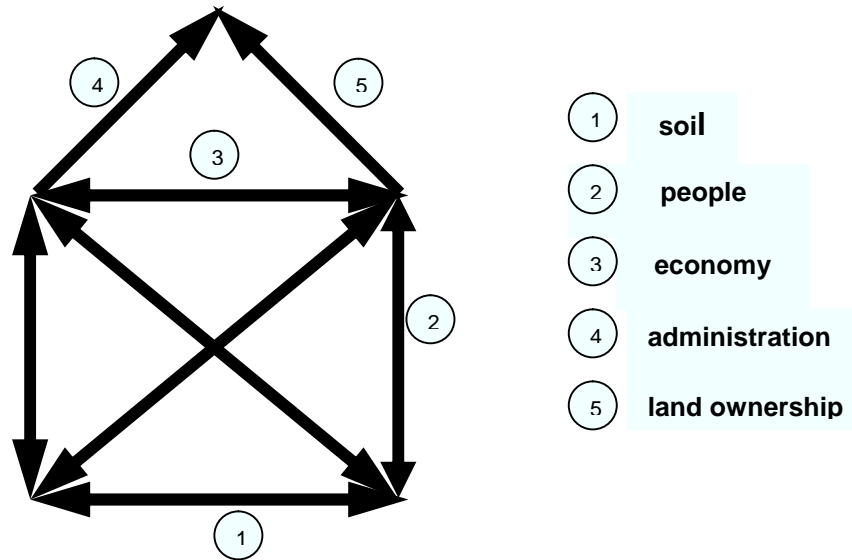


Fig.5 Land ownership threatens soil. Damaging or polluting soil it rejects people and rejected people diminish economy and administration. Endangered administration, corrupted by land owners neglects soil, and vice versa

Planning and land administration are the result of rational societal behaving, spurring the pentagon as the complex and dynamic system by their actions, with all positive and negative feedback loops between key factors, and its meaning for the future of transitional societies. Influencing or directing any of the factors the pentagon will have another shape with the soil in different position: as the priority or as secondary factor, decreasing or even disappearing. As a result all other factors will change their position and meaning in the system. If the soil will be the victim, the ultimate victim will be the people.

Belgrade, January 2009

Prof.Dr. Borislav Stojkov