

**APPROPRIATE TECHNOLOGY AS RURAL AREA'S DEVELOPMENT
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p.nik@SCnet.rs**ABSTRACT – APPROPRIATE TECHNOLOGY AS RURAL AREA'S DEVELOPMENT
CONDITION**

Many people would prefer better quality of life. Appropriate technology makes it possible to satisfy basic human needs while minimizing impact on the environment. It is important to realize that use of appropriate technology does not mean turning the clock back. It is small-scale technology. Appropriate technology is attractive because it makes households and industries more self-sufficient, and most things can be managed at a local level. It makes use of skills and technology that are available in a local community to supply basic human needs, such as food, water, electricity and waste disposal. More and more people are turning to organic food as a more reliable and safer way to feed themselves and their family. Artificial ingredients used to make a product low fat or low in calories are starting to be questioned. Most consumers now recognize the fact that non-organic foods can contain pesticides, chemical fertilizers and herbicides. Organic farming is the basic appropriate technology for rural areas. It's the best place to start developing in rural part of country. Appropriate technology emphasizes the use of renewable resources, like the energy from the sun, wind, or water also. With appropriate technology, the person who produces a product for the market also becomes the consumer-the person who uses it, and this has several advantages: consumer-producers are more likely to care about their work. Goods are more reliable and of higher quality. By growing more of own food and producing and buying goods in own communities of rural part, person spend less time and money on transportation, produce less waste and consume fewer environmental resources. Local population uses new development chances and opportunities: people are the key to sustaining long-term social and economic development in rural, and with their skills, spirit and passions, they play an important role in shaping a successful future for rural development. Plan is to bring appropriate technologies to the point where they can attract sources of financing and become viable businesses. The goal is to improve productivity of farms in a sustainable manner with minimizing risks to ecosystems, including sustainable usage of biological and ecological processes, forests, sustainable wildlife preservation and create opportunities to employ outside of farms, especially for the poor and those who live in marginal areas.

Key words: appropriate technology, organic farming, rural development, rural economy

Ključne reči: prihvatljiva tehnologija, organska proizvodnja, ruralni razvoj, ruralna ekonomija

INTRODUCTION

Environmental problems all over the world have been influenced partly by the increasing population, survival needs of the poor and the economic greed of the commercial interests and aggravated by prevalent economic models and policy structures which are deeply embedded in unsustainable patterns of production, consumption and exchange; ill-informed policies and programs and the inappropriate development strategies. The technological approach comprises comprehensive land use/resource management plans and their implementation for rational allocation and utilization of natural resources. It aims to monitor and mitigate environmental change using physical tools and modern technologies such as mapping, Geographical Information Systems (GIS), remote sensing, etc, environmental impact techniques, soil management, biotechnology and other techniques.

Food, energy, water, and waste disposal are very important about ecological systems. The sustainable production and use of organic food are influenced by a number of

factors, largely of socioeconomic and institutional in nature. Rural people derive a substantial portion of their income and products for their basic health care needs from medicinal plants gathered from the nature.

An economic approach to resource management is based on the premise that there is a need to rationalize the allocation of natural resources and optimize their use through competitive market economies to achieve maximum economic efficiency. This approach is restrained as it assumes that; a) cost and benefits from the use of natural resources are known and quantifiable and; b) costs and benefits from one resource can be isolated from those of another. Minimizing production costs and maximizing monetary benefits in order to strive for economic efficiency tends to increase pressure on some resources and neglect other resources for being of little or no significance in terms of economic development.

Both appropriate technology and rural communities are in great need of sustainable partnership for their mutual survival and prosperity. Since development comprises integrated development of people's health, protection of environment, and provision of livelihood security to the poor, Industry and private sector should shoulder this social responsibility to solve their both short and long-term problems in the process.

MATERIAL AND METHODS

In terms of the socio-cultural, demographic and economic aspects, rural areas are very heterogeneous. They are characterized by depopulation, poor equipping in terms of infrastructure facilities and communal systems, as well as by a modest, insufficiently developed economic structure. Differences in socio-economic development, demographic trends, and culture are equally marked.

Demographic structure in urbanized villages, located near big cities, is more favorable than in other types of the villages, while infrastructure is frequently much better than in urban or suburb settlements. In these areas participation of mixed and non-agricultural households is greater compared to those purely agricultural? Dispersion of industry has led to the more dynamic urbanization, with a decreased difference in the standard of living compared to the urban areas. The prospective of such settlements is more favorable.

We can find villages with more intensive agricultural production. In those areas the rural ambient is relatively better preserved. Agricultural production in is differentiated, reflecting the way in which the process of economic division was carried out in the preceding decade. There are seen to be bigger, economically stronger households with a greater area of their own farm or of rented land. They are important market producers and they engage an additional labor force on either a part-time or a full-time basis. These households are better equipped in terms of mechanization. Some of them carry out agricultural contracting services for other farmers, and sometimes they are involved with some kind of trade or primary processing (e.g. feed mixing plants, mills, etc.). On the other hand there are households with only modestly sized own holdings, whose production is mainly the primary one, while the market surpluses are small and sporadic. Agricultural households are dominant compared to the mixed or non-agricultural ones, while other activities are closely linked with agriculture.

Empty villages are rural settlements which are disappearing and where depopulation has left deep consequences such as senility and devastation. These villages are typically far from main communications, communal centers or big cities. Agriculture systems are extensive while the resources are neglected. Food production comprises the largest segment of the rural economy. Part-time farming is extremely common. The area has a fairly well developed infrastructure. Small and medium-sized farms and the foodstuff industry are well developed, but farmers' co-ops and other forms of associations of common interests are insufficiently developed and those that exist are poorly organized. The dominant sectors are livestock (cattle breeding), fruit growing and wine growing; field crop growing is also well developed, mostly for fodder. Vegetable growing is a complementary sector found in this region.

The rural area has a diversity of agro-climatic conditions, infrastructure, and access to markets, patterns of settlement, and non-agricultural resources and employment opportunities. Rural communities tend to be located around pockets of arable land, and are small and highly dispersed. There are many small villages and a low overall population density, but it can offer considerable potential for agro- and eco-tourism. Processing capacity is relatively small and is directed to wine, sheep, fruit and vegetables. Given the limited potential for agriculture, low levels of socioeconomic development, and poor infrastructure and access to markets, aggregate agricultural production will probably contract further in the medium term.

The focus in the rural areas was on the development of small-scale industries based on appropriate technology. Harmony between technology and social context is important. Using appropriate technology to stimulate production and employment in the sectors outside the modern sector is such an important objective that it ought to be seen as a national imperative. Appropriate technology as a development approach is intended to address such socioeconomic problems, especially in the rural and informal sectors. It is intended to raise productivity and incomes outside the advanced technology sector and so extend the benefits of development throughout the population (STEWART, 1985).

An appropriate technology, as asserted by the economist Schumacher, should promote values such as health, beauty, and permanence. Low cost and low maintenance requirements are also of prime importance in Schumacher's definition.

Considering both Schumacher's observations, the goals for ecological farming are:

- Produce abundant, safe and nutritious food
- Reduce harmful environmental inputs
- Provide healthful conditions for farm workers
- Protect the genetic make-up of native species
- Enhance crop genetic diversity
- Foster soil fertility
- Improve the lives of the poor
- Maintain the economic viability of farmers and rural communities.

Organic farming is the basic appropriate technology for rural areas. It's the best place to start developing in rural part of country. Appropriate technology emphasizes the use of renewable resources, like the energy from the sun, wind, or water also. Many studies have shown that the consumers are ready to buy organic products and to pay more for certified organic food. Consumers choose and pay higher prices for locally grown fruits,

vegetables, meat and milk products, and products from specific regions because they know that no chemicals are used.

The concept of organic farming means agricultural production of healthy food in healthy and natural way. Basic components of the system of organic production are avoiding usage of artificial substances in production and promotion of exclusively natural substances which are used as fertilizers, pesticides or additives in production and food processing.

The simplification and pollution of agro-ecosystems must be avoided or countered by adopting chemical-free and diversified agricultural systems

The use of pesticides (i.e. herbicides, fungicides, insecticides) poses both known and unknown risks to biodiversity, impacting wildlife on many different levels, from direct to indirect lethality to non-lethal but severely debilitating effects.

Synthetically compounded nitrogen fertilizer poses multiple risks to both wildlife populations and human health. Dissolved nitrate levels of 2 ppm or greater are known to interfere with normal development of amphibians with levels above 10 ppm known to be lethal (ENVIRONMENT CANADA 2002; BUGG AND TRENHAM, 2003). Elevated nitrogen and phosphorus levels in aquatic ecosystems have led to extensive eutrophication and degradation of freshwater ecosystems in many areas where agriculture is concentrated.

This loss of biodiversity has also resulted in a reduced capacity of agro-ecosystems to perform many essential ecosystem functions such as purification of water, internal regulation of pests and diseases, carbon sequestration, and degradation of toxic compounds (ALTIERI, 1999).

Each of these impacts has the potential to interfere with the reproductive success of wildlife and further reduce the habitat quality and biodiversity of agricultural and surrounding ecosystems (EDGE, 2000).

RESULTS AND DISCUSSION

The goal is to improve productivity of farms in a sustainable manner and rural income, with minimizing risks to ecosystems; create opportunities to employ outside of farms (especially for the poor and those who live in marginal areas); transfer of ecologically appropriate technology, including sustainable usage of biological and ecological processes, forests, sustainable wildlife preservation, hunting and fishing.

Associations for technology development have to provide information on existing low-cost, labor-intensive technologies, creating nonexistent technological innovations, and publishing important how-to-do manuals on affordable do-it-yourself work methods. SCHUMACHER (1973) described appropriate technology as an intermediate technology would be immensely more productive than the indigenous technology.

Appropriate technology is not a universal substitute for the conventional modern technology. Appropriate and modern technologies are complementary rather than contradictory, and the emphasis given to the former does not and should not rule out the

use of the latter in those cases where they are particularly well adapted to local conditions.

Appropriate technology is not meant to be static or promote stagnation but to change as a country achieves progress in its level of development. In the end a new and different kind of appropriate technology with emphasis on environmental sustainability must take precedence as success is realized in the eradication of abject poverty and the reduction of unemployment and inequality.

Appropriate technology may have been practiced for many generations in the past, but there is something new today. It has evolved into a development approach that is aimed at tackling community development problems. Viewed in this way, appropriate technology cannot be seen simply as some identifiable technical device. It is an approach to community development consisting of a body of knowledge, techniques, and an underlying philosophy. One of the advantages of appropriate technology is that it can be an effective way to shift to modern technology.

In terms of available resources, appropriate technologies are intensive in the use of the abundant factors, labor, economical in the use of scarce factors, capital and highly trained personnel, and intensive in the use of domestically produced inputs.

In terms of small production units, appropriate technologies are small-scale but efficient, replicable in numerous units, readily operated, maintained and repaired, low-cost and accessible to low-income persons. It can be an effective way to shift to modern technology.

As appropriate technology improves the productive capabilities of a community, the community influences and improves the level of technology as well. It also builds on the skills and resources to raise the productive capacity of a community. The characteristics or criteria of appropriate technology discussed above are not meant to imply that there is a perfect technology or a panacea that can resolve all the socioeconomic problems at once. The fact remains that circumstances vary from one society to another.

Farmers and forest dwellers are the main inhabitants and users of rural areas as well as lands connecting these areas. In protected area categories where agricultural activities are allowed, there is need to consider productive activities which provide livelihoods in an equitable and environmentally-friendly way. Rural area, including biodiversity conservation and local community are main discussion themes. Relationships between local communities and appropriate technology are options for sustainable livelihoods within and around rural areas. The economic potential may be limited due to high prices and low demand. Potential might be realized through market development to increase consumption. A rational answer to changes in economic conditions for farmers is to seek opportunities for new sources of income besides agricultural production.

Economic potential include appropriate technology transfer for rural areas:

- Alternative Beef Marketing
- Dairy Products On-Farm
- Farms aping to Enhance Biological Control
- Herb Production and Marketing
- Organic Blueberry Production

- Organic Cranberry Production
- Overview of Organic Fruit Production
- Organic Certification
- Marketing Organic Livestock Products
- Mushroom Cultivation and Marketing
- Organic Culture of Bramble Fruit
- Sustainable Beef Production.

Small scale production of fresh and quality organic food targeted at farmer's markets and speciality retail outlets may have the most potential for new entrants. However, these markets will be limited by the seasonal nature of production.

The ability of organic agriculture, eco forestry and sustainable forest management to build self-generating food systems and connectedness between rural areas is addressed in this paper. Also, farmers' involvement in income-generating activities such as agro-ecotourism is considered. Individual farms are integrated into the wider landscape. Integrated landscape planning is necessary for the effective management of protected areas and that multi-sect oral policy and planning, including the agriculture, forestry, tourism and environment sectors, have a role to play in such a collaborative resource management. The ultimate objective is to recognize the interdependence between sustainable agriculture and biodiversity conservation and in so doing, promoting options that address food and livelihood needs while protecting the natural heritage, table 1,2.

Table 1: Number of organic farms in EU

	ISO	2007	2006	2005
COUNTRY				
Italy	ITA	45,231	45,115	44,733
Austria	AUT	19,997	20,162	20,310
Germany	DEU	18,703	17,557	17,020
Spain	ESP	18,226	17,214	15,693
Greece	GRC	23,769	23,900	14,614
France	FRA	11,978	11,640	11,402
Switzerland	CHE	6,199	6,300	6,420
United Kingdom	GBR	5,506	4,485	4,285
Hungary	HUN	1,242	1,553	1,553
Slovenia	SVN	2,000	1,953	1,718
Serbia	SRB	35	35	..

Source: Agriculture and Food: ults dynamically generated 2-27-10

Table 2: Area under organic management by country

COUNTRY	ISO	Organic lend area (hectares)
Italy	ITA	954,361
Germany	DEU	767,891
Spain	ESP	733,182
United Kingdom	GBR	690,270
Hungary	HUN	128,690
Serbia	SRB	20,542
Switzerland	CHE	121,387

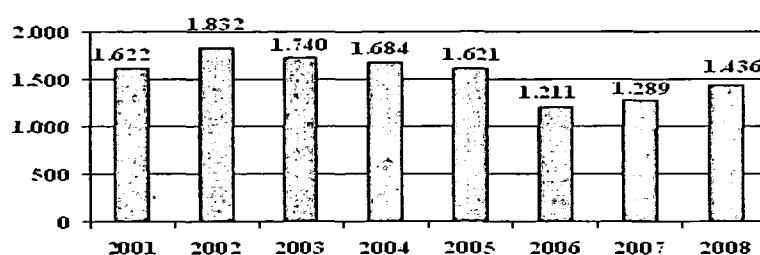
Source: The World of organic agriculture: Statistic and Emerging Trades, 2006.

The rural landscape, usually a combination of wild and agro-ecosystems, is the most important resource for tourism development. Rural hospitality offers new employment and income generating opportunities for rural populations, including agro tourism and agro ecotourism. Ecotourism is nature-based and agro tourism is farm-based, agro-ecotourism is a combination of both. Small-scale agriculture can become economically viable if quality products could be marketed and income is supplemented by tourism activities. Increases "green" tourism opportunities and favors organic farmers because they can easily meet these new tourists' demands (ecological and gastronomic terms and quality).

Serbia has excellent conditions and potentials for development of agriculture in rural regions. Thanks to its geographical position and natural and climate characteristics it has all the necessary conditions for the development of all the branches of agriculture (such as husbandry-farming, fruit growing, wine growing, cattle breeding, beekeeping-apiculture, collecting medicinal herbs and wild fruit). Special potential for development of organic agriculture is implied in fact that for years there was low or no application of chemical means, because of bad financial and economic situation of farmers.

Organic agriculture was initiated in 1990 by the Association Tetras in the municipality of Subotica. Serbia's climate offers favorable conditions for mechanized field crop farming and vegetable production. Organic development in Serbia is export driven. The most important organic products are wild or cultivated fruit and berries exported as frozen or processed, and frozen, salted and dried wild mushrooms. Exports consists primarily of frozen berries (raspberries, strawberries, blackberries and blueberries) and smaller amounts of frozen and dried plums and sour cherries, organic certified jams, sweets, apple concentrate, vinegar, and juices. Most production is concentrated around the cooling plants. 72 operators on 2411 ha, 0.14% of the arable land, were certified in 2006, and 2,155 ha is under conversion; the potential for further expansion is great. Certified land area for wild production (berries, mushrooms, and herbs) is approximately 450,000 ha, which represents 12% of total non agriculture land.

Approximately 44% of the population lives in rural areas. The main regions for organic fruit production are Central and South Serbia, where the most important organic certified cooling plants are located. The cooling plants gather farmers into grower groups, between 15 and 600 farmers per group. A few companies deal with wild and cultivated dried medicinal and aromatic herbs for export. The collection of certified organic wild mushrooms also is well developed, primarily in the southwestern parts of Serbia. Frozen, salted, and dried wild mushrooms are major export products. Donors and investors are very interested in further development of organic fruit production in Central Serbia. Certified organic vegetable production is relatively small. Fresh, frozen, and preserved vegetables as well as ground red peppers are mainly exported, but some fresh vegetables are placed on the domestic market as well



Area under medical plant in Serbia
Source: Statistical Office of the Republic of Serbia

CONCLUSION

Appropriate technology as it concerns social and economic development. The appropriate technology was suggested as a substitute, in part for including the social and cultural dimensions of innovation. The national and international disparities in the level of development are so great that any suggestion of inflexibility in the technological and socioeconomic development strategy employed would be grossly unrealistic. Development must not take an either/or stance regarding technology input; it requires both large- and small-scale appropriate technology. Conventional development strategy has been dominated by economic growth. By opting for capital-intensive production technology in spite of their shortage of capital, can only afford to create a few jobs for a small number of people due to a very high capital/labor ratio.

Advantage of organic agriculture is in production of highly valuable, healthy and safe food, which will become the source of health for people and animals. The second great advantage is preservation and protection of the environment, which provides clean land, waters and air for us and for ancestors as well. Recent studies have also provided evidence of the impacts and risks to agro-ecosystems and wild biodiversity from genetically engineered crops. The third value is for the agricultural producers themselves because they ensure disposal of goods and higher prices for the same products in comparison with conventional agriculture. The fourth value is for the state and it reflects upon the growth of agriculture and economy, in opening new business, increasing income per inhabitant, thus increasing living standard and quality of life.

By the implementation of appropriate technologies in rural areas at ensuring environmental sustainability, quality of organic farming becomes higher. Using of small Renewable Energy Power Plants in a production of energy for the farms (based on wastes and biomass; water, wind or solar energy) could provide energetic efficiency in rural areas and affected on its environmental pollution.

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