

Green Extension for Green Agriculture

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Abstract: Since the past, the issues that have concerned the agricultural extension have changed significantly. As a matter of fact, this is mostly because of the change of needs and priorities. For instance, the priorities of agricultural extension activities in the middle of the 1900s, which focused on agricultural productivity and production increase have changed today. In the 2000s, the priority of extension services may be considered to be conducting activities that seek to implement production techniques encouraging preserving the environment, nature and natural resources, rather than agricultural production increase. By green extension activities, it has been aimed to raise farmers' environmental awareness levels to make them implement environment-friendly agricultural techniques (organic agriculture, sustainable agriculture, good agricultural practices etc.). In this study, the green extension concept and an agricultural extension organized for implementing green agricultural practices will be presented. The study will primarily focus on green agriculture. In this context, the negative effects of traditional agriculture, the definition of green agriculture, the purposes of green agriculture and the green agricultural practices will be examined. Subsequently, the green extension concept that may help green agricultural activities be implemented will be emphasized. In this regard, the definition of green extension, the purposes of green extension, the differences between the green extension and the traditional extension and the effects of green extension on the environment and producers will be examined.

Key words: green extension, green agriculture, environment, sustainability

Introduction

Including various studies such as increasing fertility and quality or gaining of animal and plant production by using land and water resources, agriculture meets food requirement of the world's population as being the most harmonious sector with the environment from the past to the present. However, agriculture which was seen as an environment-friendly activity in the past has recently turned into a sector that has negative effects on environment due to extensive input usage to increase yield per unit area (Hasdemir and Hasdemir, 2016).

These extensive production techniques and excessive use of chemicals lead to various social, economical, environmental and ecological problems such as erosion, pollution of surface and ground waters and destruction of natural life. Excessive use of chemicals against pesticides develops more resistance, and it increases production costs because of the need for more chemicals (Budak, 2000). The positive and negative effects in question indicate that agriculture is multifunctional. Therefore, agriculture should be taken into consideration not only in economical, but also ecological and social terms (Çukur and Işın, 2008a). Feeding the world population, which is expected to exceed 9 billion by 2050, is regarded as a fundamental problem. A crowded planet adds to the environmental challenges of feeding, clothing and powering the world. Water supplies will be increasingly scarce, threatened by pollution, and diverted to population centers (Towery and Werblow, 2010). It is not quite possible to increase tilled land, and also the water resources used for agricultural production are rapidly decreasing. Thus, it is required to increase agricultural output per unit area, not the tilled land in order to supply production for the growing population (Çetiner, 2011), which is only possible with the existence of healthy agricultural land.

Chemical fertilizer and pesticides used during agricultural activities, incorrect cultivation practices can lead to environmental problems. Therefore, alternative agricultural systems have become a current issue in order to counteract the negative the effects of agriculture on environment (Çukur and Işın, 2008b).

Green agriculture can be regarded as the alternative to other agricultural systems. Green agriculture is defined “as a way to promote agricultural growth and development, while preventing environmental degradation, biodiversity loss, and inefficient natural resource use and, where possible, contributing to ecosystem service benefits”(Tiongco et al., 2015). Green agriculture is based on environment-friendly agriculture, where high technology leads, green production and green food are characteristics, and whole nation’s green consciousness is established (Li, 2009).The greening of agriculture refers to the increasing use of farming practices and technologies that simultaneously:

- maintain and increase farm productivity and profitability while ensuring the provision of food and ecosystem services on a sustainable basis;
- reduce negative externalities and gradually lead to positive ones; and
- rebuild ecological resources (i.e. soil, water, air and biodiversity natural capital assets) by reducing pollution and using resources more efficiently (UNEP, 2011a).

Green agriculture focuses on maintaining or increasing productivity and profitability, minimising environmental damage and rebuilding ecological resources (Musvoto et al., 2014). Green agriculture is characterized by a shift toward the use of environmentally sustainable practices, such as the efficient use of water, the widespread use of organic and natural fertilizers, optimal tillage and integrated pest control. Creating a green agriculture requires tangible assets, financial investment, research and competency in diverse areas:

- management of soil fertility,
- more efficient and sustainable use of water for crops and livestock;
- efficient management of the health of plants and animals;
- the mechanization of farms (Yerkinbayeva et al., 2014).

Effects of Conventional Agriculture and Benefits of Green Agriculture

In comparison to other sectors in economy, it is known that agriculture has both negative and positive effects on the environment. For instance, developed agricultural practices affect habitat, oxygen production and climate in that region positively. However, in the regions of intensive agricultural practices, inorganic nitrate pollution, pesticide pollution and salinity problems can be observed as some negative effects of agriculture on environment (Karaer and Gürlük, 2003).

Results of conventional agriculture can be listed as below:

- Increased costs, uncertainty in providing energy and agricultural chemicals,
- Increased herbicides and insecticide resistance weed and insects,
- Decreased soil fertility,
- Surface and groundwater pollution due to sediment and agricultural chemicals,
- Destruction of wild life and beneficial insects,
- Increased risks for animal and human health caused by pesticides and food additives and
- Depletion of limited nutrient reserves (Atış, 2004).

Agriculture has significant effects on the environment. Environmental risks that may arise from different agricultural practices are shown in Table 1.

Table 1: Summary of environmental risks and related agricultural practices

Environmental risk	Related agricultural practice
Natural forest conversion to agriculture	<ul style="list-style-type: none"> • Large-scale expansion of monoculture plantations, particularly oil palm estates • Clear-cutting operations by timber industry before planting of commercial agricultural commodities
Habitat loss	<ul style="list-style-type: none"> • Intensive and monoculture agricultural practices along the border of protected areas • Discontinued vegetative covers from high-conservation-value forests to agricultural lands
Erosion	<ul style="list-style-type: none"> • Poor site selection such as loose soil and steep slope • Parallel contour ploughing • Ground cover plant clearing • Slash-and-burn • Incorrect perceptions on certain good agricultural cultivation practices, such as contour ploughing can cause root rots and ground cover plants can cause infertile commercial commodities.
Reduction of aboveground carbon Stock	<ul style="list-style-type: none"> • Large-scale conversion originated from natural habitats such as undisturbed forest and peat land, mostly by estates, which causes 'carbon debt.'
Increased GHG emissions	<ul style="list-style-type: none"> • Persistent flooding of irrigated rice cultivation, causing higher emissions than in rainfed rice cultivation • Excessive use of synthetic fertilizers • High-yielding rice varieties producing higher emissions than local rice Varieties
High water footprint	<ul style="list-style-type: none"> • This varies among commodities and processing
Air and water pollution	<ul style="list-style-type: none"> • Slash-and-burn particularly in dry season • Commodity processing, particularly latex rubber processing and palm oil mills • Inefficient use of synthetic fertilizer

Source: Leimona et al., 2015

Nowadays people are questioning the environmental, social and economical effects of conventional agriculture. Thus, numerous farms are in search of alternative practices that make more sustainable agriculture possible. One of these alternative agriculture systems, organic or ecological agriculture is based on modern technology, crop alteration, green fertilizer, animal manure, compost, organic fertilizer and biological pest control and the use of agricultural chemicals should be left out (Atış, 2004). In order to minimize harmful effects on environment, farmers conduct agricultural production with the help of crop rotation, mulching, push/ pull technologies, careful water use and proper soil cultivation methods.

A primary goal of green agriculture systems is to enable farmers to increase the efficient use of inputs to realize higher produce yields in order to meet growing consumer demand for nutritious food. Of equal importance are goals to improve the social equity and prosperity of farmers and their communities and to restore and maintain a healthy environment (Binns, 2012). Organic agriculture, sustainable agriculture, good agricultural practices, natural agriculture, low input agriculture, integrated pest management etc. can be listed among green agriculture practices. Several researchers have stated that green practices in agriculture sector have positive effects on climate change and ecosystem services besides providing benefits to micro and macroeconomics (Toprak, 2015).

Evidence of significant environmental amelioration via conversion to organic agriculture is very substantial, pesticides are virtually eliminated and nutrient pollution substantially reduced; loss of biodiversity, wind and water erosion, and fossil fuel use and greenhouse warming potential are all reduced in organic agriculture relative to comparable conventional

agriculture systems (Özçatalbaş et al., 2010). Potential benefits of organic agriculture can be seen in Table 2.

Table 2: Potential benefits of organic agriculture

Parameter	Potential benefits
Agriculture	Increased diversity, long term soil fertility, high food quality, reduced pest/disease, self-reliant production system, stable production
Environment	Reduced pollution, reduced dependence on non-renewable resources, negligible soil erosion, wildlife protection, resilient agroecosystem, compatibility of production with environment
Social conditions	Improved health, better education, stronger community, reduced rural migration, gender equality, increased employment, good quality work
Economic conditions	Stronger local economy, self-reliant economy, income security, increased returns, reduced cash investment, low risk
Organizational/ institutional	Cohesiveness, stability, democratic organizations, enhanced capacity

Source: Crucefix, 1998.

When organic farming is evaluated for farmers training and extension, fourteen major subjects should be considered: (Özçatalbaş, 2014)

- adopting an organic farming philosophy to farmers
- training of farmers for organic farming
- training of organic farming for conventional farmers
- training of processors of organic production
- teaching the benefits of organic farming to supermarket chains
- training of trainers on organic farming
- training of researchers and extension worker or adviser on organic farming
- teaching the benefits of organic products to children
- making awareness of consumers on organic products
- developing awareness of policy maker on organic sector
- developing awareness of all relevant direct and indirect stakeholders on organic products
- organizing promotional and educational activities (urban extension) for enhancing domestic and foreign markets
- considering the use of information technology and internet in this subject
- developing awareness to cooperate all relevant public, farmers' organization, and private sector on organic products.

Sustainable agriculture consists of agricultural systems and practices that do not do damage to the agricultural ecosystem and enable nature to renew itself. The goal of sustainable agriculture and sustainable agricultural practices is to achieve safe food and fiber supply without depleting natural resources or harming the environment (Çeker, 2016). Sustainable agriculture can be assessed in terms of economical, environmental and social aspects (Table 3). As it is seen in Table 3, sustainable agricultural activities have effects on numerous fields ranging from animal welfare to climate change.

Table 3: Potential effects of sustainable agriculture

Pillars	Potential effects
Environmental pillar	Land and soil, water, ecosystem health and biodiversity, air, energy, climate change, chemical use and inputs
Social pillar	Working conditions, Training and development, Local economy, Animal welfare, Health and safety
Economic pillar	Safety, quality and traceability, Financial stability, Supply chain efficiency, Risk management

Source: SAI platform, 2013.

Green growth has various effects on agriculture, and agriculture has various effects on green growth, as well. It is indicated in Table 4.

Table 4 : Agriculture and Green Growth: Complementarities (+) and Differences (-)

	Economic Contribution of Agriculture to Green Growth	Environmental Contribution of Agriculture to Green Growth	Social Contribution of Agriculture to Green Growth
Economic Contribution of Green Growth to Agriculture	Agriculture is the basis of economic development while Green Growth can improve agricultural performance (+)	Green labels and eco-services can contribute to economic returns in agriculture (+)	Green jobs and activities can diversify and contribute to rural development (+)
Environmental Contribution of Green Growth to Agriculture	Environmental measures may slow agricultural growth in the short-term (-)	Green Growth will yield environmental co-benefits in agriculture through resource conservation and carbon sequestration (+)	Reform of supports to relieve environmental stress can promote more equitable farm incomes (+)
Social Contribution of Green Growth to Agriculture	Green Growth may detract from efforts to improve food security in the short-term (-)	Green Growth will necessitate structural adjustment measures in transition periods (-)	Food security, poverty reduction, and rural development will be enhanced through Green Growth (+)

Source: Stevens, 2011.

Green Agricultural Practices around the World

Green agriculture is a sort of system which carries out agricultural production with “green technology”. It has three basic contents. These are biological diversity, keeping harmony and unity of nature and economy during the course of agricultural development, and producing agricultural products of pollution-free and nuisance-free (Zhongdong, 2010).

According to (UNEP, 2011b) adopting resource-conserving practices (such as integrated pest management, integrated nutrient management, low-tillage farming, agroforestry, aquaculture, water harvesting and livestock integration) resulted in average yield increases of 79%, while improving the supply of critical environmental services. Estimates suggest that for every 10 percent increase in farm yields, there has been a 7 percent reduction in poverty in Africa, and more than 5 percent in Asia (UNEP, 2011e).

In the Philippines, the concept of sustainable agriculture is well established, yet the term “green agriculture” is not well known. The policies and strategies used to promote green agriculture are thus embodied in the support for organic agriculture, and for climate change adaptation and mitigation (Tiongco et al., 2015).

Kawasaki (2015) stated that green technologies and waste utilization can make an important contribution to GHG emissions reductions in Thailand. Kassie et al. (2009) found that sustainable farming practices enhance productivity in Ethiopia. Sultan and Harsdorff (2014) stated that there is great potential for greening agricultural, fishing and forestry activities to generate additional green jobs opportunities in Mauritius. According to (UNEP, 2011c) green practices can increase productivity, on average, by 79% on small farms.

Green agricultural practices can add value to the selling price, as well as opening up export opportunities. In Uganda, for example, certified organic exports increased from US\$ 3.7 million in 2003/2004 to US\$22.8 million in 2007/2008, with organic products being sold at prices up to three times higher than conventional products. The increasing demand for organic

and sustainably farmed agriculture suggests strong trajectories for those products and the African farmers who produce them. The global market for organic food and beverages is projected to grow to US\$105 billion by 2015, from the total value of US\$62.9 billion in 2011 (UNEP, 2015).

A range of factors provide impetus for a transition to sustainable production in South African agriculture. These include water scarcity and climate change, decreasing soil health, the high cost of energy and other inputs and increasing food demand. These are coupled with consumer awareness about pesticide residues, ecosystem degradation, pollution and declining nutritional value in food (GreenCape, 2016).

Green marketing is an important field, which can contribute to green business development in agriculture. Organic agriculture has developed in recent years in Romania, but there are steps to be taken to reduce the gaps with highly developed countries. Adopting green marketing in agriculture involves acceptance by the various participants (producers, consumers) of the costs and benefits of green products, both in the short term and long term (Aceleanu, 2016).

Because green agriculture has more added value and requires higher skill workers than traditional agriculture, where 21.6 percent of all workers are non-Jordanians, this could open up new job opportunities for local Jordanian workers (UNEP, 2011d).

As for agriculture in Kenya and Africa, in order to ensure that our tables remain full of food, we need to say no to unsustainable, business-as-usual agriculture. We need a green agriculture that sustains livelihood and replenishes natural resources. Green agriculture involves scaling up farming practices that maintain the resource base, so that it continues to support food security and rural development (Kalua, 2014).

Green agricultural practices also allow farmers to reduce production costs due to efficiency gains and potentially to avoid additional costs that may arise as a consequence of climate change or unsustainable practices. For example, in Burkina Faso, the agriculture sector is highly vulnerable to the impact of potential climate change (UNEP, 2015).

Agro-ecologically based methods of rice production known as the System of Rice Intensification were documented in Madagascar to increase yields by 50-100 percent using less water, reduced or no agrochemical inputs and less cost of production (ECA, 2015). Green agricultural practices in some countries around the world are shown in Table 5.

Table 5: Green agricultural practices some countries

Country	Benefits
Uganda: Organic farming	<ul style="list-style-type: none"> - Export earnings and revenue for farmers- certified organic exports increased from US\$3.7 million in 2003/4 to US\$22.8 million in 2007/8. - Climate change mitigation - GHG emissions per ha from organic agriculture are estimated to be on average 64% lower than emissions from conventional farms. - Carbon sequestration – evidence that organic fields sequester 3–8 tonnes more carbon per ha than conventional agriculture. - Increase in area under organic agriculture & participating farmers: 2004 - around 185,000 ha of land under organic farming with 45,000 certified farmers. By 2007: 296,203 hectares of land under organic agricultural production with 206,803 certified farmers.
India: Maintaining ecological infrastructure through labour intensive wage employment	<ul style="list-style-type: none"> -Increase in the average wage for agricultural labourers. -Enhanced livelihood security of marginalised households in rural areas. -Promotion of inclusive growth. -Contribution to the restoration and maintenance of ecological infrastructure. -Training and jobs for villagers to develop solutions to their heavily silted water harvesting infrastructure. -Alleviating water shortages. -Increasing agricultural output through increased availability of water.
Barbados: National	<ul style="list-style-type: none"> -Plan not yet implemented but potential range of benefits including social, economic and

strategic Framework	environmental as the plan touches on all aspects of society.
Cuba: Transition to organic agriculture	-Positive impact on livelihoods; -Steady income for a significant proportion of the population; and -Lack of pesticides for agricultural production – which is likely to have a positive long-term impact on Cubans’ wellbeing since such chemicals are often associated with various negative health implications such as certain forms of cancer
Tanzania: Smallholder woodlots as a strategy for climate change adaptation	-Building capacity of communities and disadvantaged groups in improved woodlot management; -Improved smallholder livelihoods; -Increased incomes and council revenues from royalties on timber sales -Promoted inclusive growth; and -Promoted savings and credit operations among members and loans to finance income-generating activities.
Rwanda: Rebuilding natural capital through protection and management of the environment including preserving mountain gorilla	- Environmental, economic, and employment benefits. -Restoration of the population of the critically endangered mountain gorilla - slight increase in the Virungas National Park. -Ecological benefits of preserving a threatened species. -Scheme to protect the Rwandan mountain gorilla is also generating substantial revenues from tourism - booming tourism industry, which now accounts for the biggest share of national GDP.

Source: Musvoto et al., 2014.

Concept of Green Agricultural Extension

In today’s world, environmental awareness is seen as a mission for next generations. Humanity puts the next generations at great risk. Therefore educating people about this issue has great importance. Lack of education and indifference are the roots of lots of problems (Kızılaslan and Kızılaslan, 2005). For this reason, farmers should be informed that agriculture is not only about production, but also about the method of production, about protecting the environment. At this point, agricultural extension gains importance.

From early times to date, when agricultural policies of countries all around the world are examined, it can be seen that the policy was to ensure the food security, but today prior policy is to ensure food safety. The change in agricultural policies has caused a change in agricultural extension policies. Especially in post-second world war period, priority of agricultural extension policies was to increase agricultural production. However, this has changed a lot recently. Today, we recognize new challenges, problems, and developments for agricultural extension that further complicate matters (Rezaei-Moghaddam and Karami, 2008). The role of extension has thus widened to include issues in rural areas that go beyond agriculture and may include services such as: (Christoplos, 2010).

- Dissemination of information about technologies, new research, markets, input and financial services, and climate and weather.
- Training and advice for individual farmers, groups of farmers, farmer organizations, cooperatives and other agribusinesses along the market chain.
- Testing and practical adaptation of new technologies and practices on-farm.
- Development of business management skills among small-holder farmers and other local entrepreneurs.
- Facilitation of linkages among market actors (including financial and non-financial inputs, processing, trading, etc.) including brokering collaboration and promoting social learning among them.
- Linking small-holder farmers, rural entrepreneurs, and other members of the agricultural community with institutions offering training and education in fields relevant to the agricultural sector.
- Facilitation of linkages between farmers, their organizations and the public sector.
- Support to institutional development processes and to social, institutional and organizational innovations.

- Development of informal and formal farmer organizations, and rural youth organizations, and helping them to articulate their demands.
- Support to implementation of government policies and programmes through information, awareness and advice on technological options, including land stewardship, food safety and animal welfare.
- Contributing to the development of more appropriate policies and programmes by facilitating feedback from farmers and local entrepreneurs.
- Increasing awareness of new opportunities for certification of ‘green,’ fair trade and other production methods.
- Facilitating access to non-extension government support (such as weather-related insurance, phytosanitary and certification services) and subsidy programmes, including payment for environmental services and other schemes related to carbon credits.
- Facilitating access to credit from rural finance institutions for farmers and local entrepreneurs.
- Nutrition education and home sciences.
- Mediating in conflicts over natural resources.
- Legal and fiscal advice.

Information is an essential production factor in agriculture. Farmers need information to improve or adapt their farming. Farmers need extension only to the extent that it can provide them with relevant and timely information (Zijp, 1992; Petersen and Hurley, 1999). Extension through education aims to train members of the rural community, particularly producers, through a non-formal education system to alter their knowledge, skills and the agricultural methods they implement (Ozcatalbas and Brumfield, 2010). Extension education is both used in many developing and developed countries of the world not only in agriculture, but also in public health, rural development, youth, children and women’s education, sustainable management of the environment and natural resources, social capital organization (organization and establishing a communication network) and in combating against hunger, poverty, drugs and AIDS. However, the most ancient and the most common practice of extension are still in the area of agriculture (Demiryürek, 2014).

The major objectives of extension systems in the agricultural development process. The four major types of objectives include: 1) technology transfer, especially for the staple food crops; 2) human capital development, especially the technical and management skills and knowledge that poorly educated farm-households need to increase farm income; 3) building social capital; and 4) educating farmers to manage natural resources sustainably (Swanson, 2008).

The negative effects of agricultural activities on environment are known. Ecological balance has been affected negatively due to the use of intensive agricultural input with conventional agricultural practices all around the world. This situation has revived the production of agricultural crops that has no harm to human or environment at both production and consumption phases. By the term of green agriculture, an agricultural system must be perceived which is considering agricultural production, profitability and fertility on the one hand and focusing on reducing negative effects of agricultural production on environment on the other hand.

What are the duties of agricultural extension for farmers to practice and adopt green agriculture? The answer to the question is actually the definition of green extension. The green extension concept refers to an agricultural extension organization which is organized for adopting green agricultural applications. By shifting development paradigm, experiences in agricultural extension and development have indicated that traditional approaches will need to transform in order to move toward sustainability (Allahyari, 2009).

These questions by farmers must be answered in order to adopt and practice green agriculture:

- Are green agricultural practices suitable agricultural systems for environment protection?
- Do green agricultural practices cause to a decrease in production or yield?
- Do I have problems while selling green agricultural products?
- Are green agricultural practices supported?
- Do consumers demand green agricultural products?

Agricultural extension organisations should set agricultural extension programs in reply to the questions asked above and green agriculture should be conveyed to farmers extensively.

Agricultural extension services may undertake important tasks in terms of environment protection. Even if farmers are aware of the damage that their management practices cause to the environment, it is difficult to change those practices without proper information and guidance (Shinohara, 2000). Extension services should inform farmers about correct agricultural practices, correct timing and correct amount of practice as required.

Climate change is a worldwide problem that leads to decreased fertility and environmental degradation. Known also as open air factory, agricultural sector is a sector that is badly influenced by climate change the most. Growing the correct varieties and implementing correct cultural practices are quite important topics for farmers to minimize the negative effects of climate change. With these green extension studies against climate change, farmers will be able to detect a problem, learn risks of agricultural production and be informed about the precautions when they need to minimize the harmful effects.

Conclusion and recommendations

Green agriculture is associated with ecological intensification, productive conservation, and sustainable development strategies. These strategies reflect the alignment of international environmental and local small farmer interests in promoting production systems that provide more income per unit area of land (Sills and Caviglia-Harris, 2015).

A related agricultural policy must be formed and the issue must be discussed in an integrated way to extend green agricultural practices. Farmers need to be encouraged to adopt and implement green agricultural practices. Farmers must be given opportunities to practice these environment friendly agricultural techniques. For instance, extra agricultural support payments can be provided for farmers practicing green agriculture during either production or marketing phases. Premium payments can be presented for farmers. Some convenient repayment options and facilitation in obtaining loan can be provided for the farmers practicing green agriculture.

Public extension services should not be the only organisation which is responsible for extension activities for green agricultural practices. Pluralistic agricultural extension system can be defined as a system that all other partners (farmers' organisations, non-governmental organisations, private agricultural consulting companies, etc.) take an active role in extension activities as well as public extension services (Çukur and Karaturhan, 2011). For all organisations presenting agricultural extension service, green extension activities should be their priority.

The ecological dimension of agriculture in green extension activities should be discussed extensively. Protecting the environment and natural resources plays a vital part in sustaining agricultural activities today and in the future. Therefore, farmers should adjust the most appropriate green agricultural practices for their current practices and agricultural extension activities should be done for the adjusted practices. For this purpose, farmers should be informed in detail about green agricultural practices including organic agriculture, good agricultural practices, integrated agricultural product management, sustainable agriculture, low-input agriculture etc. Moreover, an intensive extension program should be applied to the

topics of food safety, combating erosion, biodiversity, soil and water pollution. On the other hand, topics such as protection of thicket and woods, rural landscape planning, protection of grass and pasture, surface and groundwater and wildlife should be considered as main studies of agricultural extension.

As it is known, extension agents are the ones who inform farmers about agricultural activities in rural area. Therefore, it is required to train extension agents about green agriculture first. Farmer-researcher and extension agent relation should be powerful, the best technological advancements for farmers' conditions should be offered to them.

Companies that sell pesticide and fertilizer may affect agricultural input use of farmers. Thus, these companies should be informed about environmental awareness as well.

By the term of agricultural multifunctionality, it has been emphasized that agriculture has social and ecological dimensions. With the extension studies, it should be conveyed to producers that agriculture has not only economical dimension but also social and ecological dimensions.

As it is known, agricultural production has a supply side and a demand side. Studies to raise awareness of consumers should be conducted so that consumers will demand green agricultural products.

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