

Youth, Social Capital and Rural Development

Promoting sustainable agriculture to the youth: a development perspective

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This paper investigates the relationship between social capital and economic growth using empirical examples from Sub-Saharan Africa, with special attention to the role of the youth in processes of rural development.

The promotion of sustainable agriculture in developing countries could have important direct and indirect implications for economic development. Growth accelerated by the agricultural sector is not restricted to the agricultural sector only, but is believed to spill over to other sectors in the economy, like processing industries, supply industries, and the transport sector. A smoothly functioning agricultural sector can increase food availability, improve price mechanisms and increase employment opportunities. In this sense, agriculture can be seen as the engine of poverty reduction and of growth of the economy in general (Dorward *et al* 2003). A prerequisite for positive spill over effects however is a good institutional quality and a high level of social capital.

Social capital is defined by trust relations, reciprocity and exchanges, common rules and norms, and networks and groups (Pretty 2003). Social capital is important for several reasons. In the first place it stimulates economic development, as it tends to lower transaction costs (e.g. costs of information, monitoring, searching, contracting), and makes people more responsive to changing market conditions. A second and related aspect is that social capital reduces risks, and supports innovative behaviour. In an environment with a high level of social capital, people are more likely to invest and to join new linkages with others, for example in farmers cooperatives. Especially the first three aspects take time to be built up; the fourth aspect is rather an outcome of the latter three characteristics of social capital. In times of crisis however, social capital can easily be broken down.

Youth can serve as an important focus group for rural development projects, especially in areas where the level of social capital is low and when institutional quality is poor. For example, the younger generation tends to be more open for innovation than the older generation (IPMS 2007). Various authors however have pointed out that the youth has higher change than other age groups to move to urban areas in order to find a job in the informal sector (see Lucas 2004) or to become active in rebel groups in times of war (see Bellow and Miguel 2006) when institutional quality is low. Focussing on the youth therefore, in programs that stimulate sustainable agricultural development, could improve social capital, reduce risk, and stimulate economic growth.

Sustainable Agriculture Led by Young New Farmers in Japan

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The food self-sufficiency of Japan is 39% in 2008. Because of the change of dietary habits to Western-style, forage crop imports have increased due to the consumption of live stock products and fats. This has caused a decrease in the demand for rice, a crop in which our country can be completely self-sufficient. Most Japanese imports come from a few specific countries. In recent years, Japan has taken measures to stop imports because of several problems: bovine spongiform encephalopathy (BSE), pathogenic avian influenza and residual agricultural chemicals. Therefore, our country's supply and demand has been seriously affected. It is obvious that Japan tends to depend on imports, which leads to uncertainty. Accordingly, our nation's duty is to reinforce the domestic production capacity. However, the number of young new farmers who can shoulder agricultural development has not increased.

The number of farmers decreased from 10,350,000 in 1970 to 3,120,000 in 2007. Despite this situation, the number of new farmers increases. Though the number of farmers had decreased sharply to 16,000 people after the collapse of Japan's bubble economy and real estate markets, it increased to more than 78,000 people in 2005. However, only 11,700 of them are young new farmers below 39 years old. In other words, farmers are aging.

Most of the farmers in Japan will leave their job because of their age before long. If it were not for the new farmers, then the domestic production capacity would not be steady. If the younger generation starts farming early, then working period will be extended. This makes the farmers' population stable and skills are improved. This will be the first step to develop our country's farming in the long run.

Thus, it is essential to increase new farmers' population, in order to sustain and develop agriculture in Japan. In this paper we analyze the present state of agriculture in Japan from our research: questionnaires to students and meetings with young new farmers and their supporters. Finally, we propose various kinds of encouragement to the younger generation to become leaders in this field.

Attach reference:

Sustainability through Eternal Power of Youth

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Organic farming is a production method more in harmony with the environment and local ecosystem because it works with nature by replenishing the soil with organic material rather than denuding it and relying upon artificial fertilizers. It places strong emphasis on maintaining the fertility of the soil, and hence the improvement of food quality, the enhancing of biodiversity. Farmers can produce crops that have not used large-scale industrial chemical inputs, with the attendant pollution of water and land degradation.

Taiwan's young people, indulging themselves in the material world, are rarely aware nowadays of where their food comes from. Most of them don't even know how sustainable food production might benefit agriculture and the natural environment.

I used to think of agriculture as just an industry of producing food. However, I drastically changed my view of agriculture after participating in an organic agriculture camp and getting involved in the operation of an organic farmers' market in Taiwan. During the camp, the young people experienced real farming practices and enjoyed interacting with organic farmers. We finally realized that food acquisition requires continuous interaction among people and the environment; food production and consumption also represents a tight connection between people and nature. The experience of helping manage an organic farmers' market made me realize that a sustainable food production system not only focuses on food production, but also on food processing and distribution. These "learning by doing" experiences make us cherish the food we eat, and pay more attention to the relationship between the food production and consumption system and the natural environment. Taking advantage of this learning approach, I would like to share these experiences to shed some light on to how to encourage young people to learn the concepts and contributions of sustainable agriculture.

Promoting Sustainable Agriculture to the Filipino Youth

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The world is facing myriads of challenges brought about by the continuous population growth, food insecurity, natural resources degradation, climate change, and recently, the instability and uncertainty of the world market for fuel. The likelihood of addressing these problems is increased if the youth is empowered to become real catalysts of change. Promoting sustainable agriculture to the youth through formal or informal education will help fortify their capacity as productive partners of agricultural development, especially in the future. Youth's contributions to sustainable development are important "to meet the needs of the present without compromising the ability of future generations to meet their needs (Brundlandt Commission, 1987)."

This paper presents an overview on how sustainable agriculture is promoted to the Filipino youth. It looks at the incorporation of the concept of sustainable agriculture in elementary, high school and college education in the Philippines. Furthermore, the study examines the efforts, including the extent to which these efforts are effective, of relevant organizations and institutions in the Philippines towards youth involvement in agricultural sustainability.

Concepts of sustainable agriculture have been seen in all levels of education in the Philippines; from the basics, that is, teaching elementary students the importance of eating food, and instructing high school students in farming plots up to the training of college students in the area of sustainable agriculture through offering of agricultural courses. Moreover, the participation of the youth in pursuit of sustainability has been evident through youth organizations such as the National Youth Commission (NYC), Youth for Sustainable Development Assembly Pilipinas (YSDA) and other province-based youth organizations. Efforts of the government in promoting sustainable agriculture to the youth can also be seen through the Philippines Medium Term Youth Development Program (PMTYDP), among others.

Despite these efforts, however, the country is still below par by world standards in moving towards a more vibrant and effective immersion of Filipino youth in the area of sustainable agriculture. Some evidence points out the declining enrollment rate in agriculture-related courses, low participation of the Filipino youth in agriculture-related activities and the persistence of problems that threatens the sustainability of Philippine agriculture.

The Seven Principles of the Concept of Modern and Sustainable Nutrition and their Meaning in the Life of Young People in Germany

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Modern and sustainable nutrition corresponds to the overall concept of sustainable development passed at the UN conference in Rio de Janeiro in 1992. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. The obvious delimitation of natural resources and the unequal distribution gave reason to generate the world-wide recognized model. The explained goal is to create equal chances for all humans who live at present and in the future on earth.

In this paper the impact of the German food system for the four dimensions of health, environment, economy and society will be presented in terms of sustainability and with a special focus on young people. On the basis of an example, taken from the ecological dimension, the relevance of nutrition should be visualised: In Germany nutrition is made responsible for 20% of the total output of greenhouse gases. Divided into the separate sectors of the food system, about half of it (52%) falls upon agricultural production, particularly meat production. These numbers show, that a reduction of meat consumption would relieve the environment considerably. This aspect turned even out to be the most important ecological measure in the range of nutrition and represents one of the following seven principles of a modern and sustainable nutrition:

1. preference for plant food
2. tasty and digestible food
3. preference for food with a low degree of processing
4. organic food
5. regional and seasonal products
6. environment- friendly packed products
7. fair trade products

The implementation of sustainable development depends on the will of us people in the rich industrialised nations as well as in developing countries, to take values like environment protection, equal opportunities and justice seriously. Youth and children are the next generations. Therefore the aim should be to attain and furthermore to inspire them for the various aspects and coherences involved in sustainability. One good thing about young people is, that they are able to rapidly adapt to changing needs the future involves. This capability should be built on in order to bring change into society more quickly. Promoting sustainable agriculture by trying to influence their choice of daily food can be a demonstrative and efficient approach. The role of the mentioned seven principles in the life of German youth will be illuminated, and changes and chances will be identified in the paper. On the one hand, there are trends which make sustainable nutrition difficult, e.g. the concentration and automation processes in agriculture and the food industry and changes in consumer behaviour. On the other hand favorable movements like the emerging “lifestyle on health and sustainability “ (LOHAS) have to be noted.

The Combination of Organic Agriculture and Tourism

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Since agriculture is an important element in Taiwanese culture, aging in agriculture is something that cannot be overlooked. But how can we influence our youth to take up farming is a big problem. If we can combine agriculture and tourism, not only can we increase abundance but we can also promote business. For example, the council of agriculture executive Yuan continues to boost the “New Agriculture Movement” in order to rediscover the beauty of rural areas, reveals countryside productions and lifestyles, the beauty of the ecosystem, and create a typical image of Taiwanese countryside. Recently, the prevailing trend in organic agriculture means that farmers all over the world have the idea that the ecology is being destroyed and the environment polluted. The reason is that since world war II, people used much petroleum energy – mechanical, chemical, fertilizer, protective medicines for plants and animals, or the process and use of breeding and genetic engineering, causing the industrialization and high concentration of agriculture production. The yield has increased obviously and solved the shortage of food provisions caused by the increasing population but it can also give rise to the so-called green revolution. As far as teenagers are concerned, we should correct their prejudice towards agriculture and to urge them to take it up. We can do this by open lectures, letting them know that farming can be very easy if combined with high technology; by holding experienced camps, letting children get in touch with agriculture from when they are young, and provide the chance for students to experience farm, fishing village and forest, and so join agriculture work to identify themselves with local people. In some countries, summer camps and outdoor education are very popular, but teenagers in Taiwan are used to a cozy life and city activities. To get close to nature, we can take walking trips and educate ourselves to experience the joy of adventure. We are looking forward to teenagers having the chance to get close to the land and proceed to identify with Taiwan’s agriculture. Learning how to look for the truth of life - re-establishing teenagers’ values – will allow teenagers to give service to the environment - world and life and the spirit of never-give-up. We even hope that teenagers can stay and work for the rural area forever and enthusiastically improve problems in Taiwan. As a result of the UN warnings of the shortage of food supply and petroleum, sustainable agriculture is getting more important. Sustainable agriculture is an integrated system of plant and animal production practices having a site-specific application that over the long term will satisfy human food and fiber needs. We need to enhance environmental quality and the natural resource base upon which the agricultural economy depends, make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls. If we can sustain the economic viability of farm operations we can enhance the quality of life for farmers and society as a whole. Even though we are facing the shortage of food supply, if we combine organic agriculture with sustainable agriculture, we can not only help famine countries but help people to have a better life.

Promoting Sustainable Agriculture to the Youth

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Since Humanity arrived on Earth, it has used nature for its needs. The last one and a half centuries have been a disaster: our industrial world and its new agricultural system have used most of our natural resources: the soil, the water, the air ; all our environment is degraded now. We can even find pollution in places people never been before!

Sustainable development tries today to be a solution to this problem by learning through our mistakes to be more careful about what we do in the present day. By definition, sustainable development is answering today's needs without putting tomorrow's world in danger. Sustainable agriculture is a part of this concept. It tries to produce food for everyone, but it also tries to protect our Earth for the future generations.

Teaching our children this way may make them understand the problem and be more careful than we have been. We must all learn from our mistakes how to use our Earth and our environment in a better way. Making the children sensitive to these problems is giving them the key of the future, and ensuring that these ideas will never be ignored anymore.

The question now is how can we teach them the right thing to do? How can children understand that our mistakes should not be theirs? And also: what must the form of our message be? Many ways exist: In France, we have developed this kind of education at school, with some basic knowledge of environment, agriculture and sustainable development. Some universities like Lasalle Beauvais take some city children to have an initiation about these subjects with the students. We have agricultural schools and teaching farms too. But does an ideal way really exist?

In this paper, we will explain the concept of sustainable agriculture and the importance of promoting it to the youth. Some examples will be explained to show how we do this in France and which way looks the best to resolve this problem.

Promoting SASEC in Japan

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At present, in the world, grain prices have risen steeply. This is not only because of the diverting of food and feed to produce bio-energy but also the rapid expansion of the demand of grain because of population explosion in developing countries and the increase of meat consumption. Moreover, yield decreases have brought about a steep price rise due to the growing of different crops for bio-fuel or abnormal weather such as the big drought in Australia and flood in the United States of America. In such international situation, it is necessary for Japan to improve food self-sufficiency. However, domestic agriculture continues to decline, with the aging of farm hands and the decrease of future farm hands.

Farm hands decreased because of economic growth after World War II. Rice farming had been sustainable in Japan until the 1950s. However, because of economic growth, industrial workers were needed than agricultural workers: workers moved rapidly from agricultural to industrial areas leading to a decrease in the agricultural workforce. Japan became rich because of the export of industrial products, while food imports have continued to increase. The decline of (calorie based) food self-sufficiency accelerated from 76% in 1960 to 39% in 2006.

Modern Japanese agriculture has been relying on chemical fertilizers and pesticides and energy. Thanks to this, people have harvested a certain amount of productions although it is small. However, it is necessary to reconsider the use energy because of soaring oil prices and global warming. In addition, this year, incidents of pesticides mixed in food imports and camouflage problems of food had the effect of raising public consciousness of food safety.

However, an increasing of farm hands is needed to raise food self-sufficiency and to guarantee safe food for the Japanese people. Agriculture must somehow coexist with market economy, and also cut off the use of chemical fertilizers and pesticides and take an eco-friendly approach to the production of food.

Below are the factors needed in order to increase food self-sufficiency:

1. Education of the importance of agriculture to next generation
2. New farmers should be inspired by policy.
3. Support for eco-friendly agriculture should be strengthened.

With regard to the above issues, Atsugi ISF will provide effective dietary education to children in elementary school with the aim of increasing the number of people working in agriculture in the future. Such an increase would solve one of the root causes for the persistent decline in Japanese agriculture. We also plan to hold discussions on agriculture in Atsugi city.

Here, we would like to propose the creation of a student network with other domestic universities to exchange opinions, co-operate in activities and share knowledge and experience by sharing the advantages of the activities of ISF.

※SASEC=Sustainable Agricultural Society of Environmental Conservation

Programs That Will Brighten Our Future: Educating the World's Youth About Sustainable Agriculture

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With the increase of urbanization and conglomerates worldwide, there are fewer and fewer people that have an understanding of agriculture and natural resources. With each successive generation, fewer people understand the importance of agriculture or even where their food comes from. In an age of global warming, elevated feed costs, and our dependency on oil and cheap labor it is becoming more and more essential to educate our youth about the significance of agriculture and natural resources. The purpose of this paper is to propose different methods to raise awareness and instruct the world's adolescents about agriculture on a local and global scale.

Community support and education can be the most effective method to plant a love of agriculture in the hearts of youth. Programs employed in the United States like 4-H can be essential in giving youth an appreciation of agriculture. Other programs in the community like Girl Scouts and Boy Scouts can teach youth to have an appreciation for the environment.

Youth programs in school like Future Farmers of America (FFA) can not only educate youth about the agricultural industry, but they can also become the foundation for gaining skills in leadership and networking.

Extension programs employed by facilities of higher learning in smaller communities that might not have access to unlimited knowledge are fundamental for delivering the most recent information to youth. New and innovative data can spark a fire of interest and ignite a desire of discovery in young people everywhere.

Volunteer programs like Ag in the Classroom are important to evoke an interest in agriculture in the very young. Reading agricultural books and performing simple hands-on activities can be enough to begin a life-long education and passion for agriculture and natural resources.

The First Step: “New education” to Inspire a Generation

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As more and more environmental crises are bearing down on us it is becoming increasingly more important to motivate and inspire younger generations to meet the challenge. There are many subtle factors that prevent us from achieving this goal. As we have become disconnected from our food system by the convenience with which we can acquire nearly any food item we desire from any part of the world, it is difficult to recognize the error in our value system. As articulated by authors, Lang and Heasman in Food Wars (2004) our society has been dominated by the Productionist paradigm in which high yields are the primary concern to meet the demand of our growing population. The first step in promoting sustainable agriculture to youth is the examination of how we think, how we learn, and what it is that we value. By understanding that the collective mind is far more powerful than the individual we can reach the level of cooperation that is necessary for our society to progress into the future. It becomes exponentially more important that we address these problems with each new generation, as their expectations for the beauty and productivity our environment decrease.

Besides the paradigm, or lens through which we see the world and collect information, another subtle but powerful force preventing youth from participating in agriculture and environmental conservation are these cognitive effects. Each generation is raised in a world much different from that of the previous one, and in modern times our growth both in population and technology has become even faster. My parents remember open fields and untouched forests, while I only know the metal and concrete structures that now occupy these spaces. Without recognizing and addressing this effect, younger generations are less distraught by the current crises and are less likely to be instilled with the passion to solve them. It is becoming more and more apparent that the first step in promoting sustainable agriculture to youth is the use of new teaching methods.

For centuries in North America, universities have been the breeding grounds for innovative ideas and bold new areas of research, but today as more people are concerned with job placement it is harder to find students eager to change the world. My experience in Land and Food Systems faculty at UBC has been the antithesis of what I knew as modern university life. Through a new teaching pedagogy and exciting new options for students, like the Global Resource Systems degree, discussion and self examination is encouraged. Never have I seen so many students that are truly inspired to achieve great things. Their concern is not on simply attaining good grades, but understanding the world’s problems and the knowledge necessary to solve them. AGSC 250 is a class required for all members of the faculty in which students have many hands- on agricultural and community experiences as well in class discussions amongst peers and professors. Every idea is encouraged and nourished. In my opinion this class and the LFS faculty as a whole is a picture of the type of “new education” that is necessary to promote sustainable agriculture to youth and instill within them a desire to participate.

Teaching Sustainable Agriculture to the Youth - A German Approach

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Agriculture, particularly sustainable agriculture, is gaining increasing interest among the public. Most important are the following fields:

- 'efficient resource use' (to align ecological, economic and social aspects, and to produce more and more food on less usable agricultural area),
- 'responsible animal husbandry' (keeping of animals in their natural environment, high standard of living, but also low impact on air, soil and water),
- 'energy supply' (renewable energies: gas, power and heat for instance from bio-gas plants or from cultivating fuel e.g. rape for bio diesel),
- 'nutrition guarantee' (quality: origin, quality control + quantity: increasing demand, shrinking farmland).

Since these items are of a tremendous meaning for our society and particularly for our future generations, we have to start to support our children in understanding and acting in such a way that sustainable agriculture is promoted.

So we have to try to sensitise young people to sustainable agriculture, and explain clearly its importance for our future. But there is not only responsibility for our own society but also for our world and the people in it, who are affected by the wrong use of resources and production. The more complex the field of reference, the more information is needed to understand the complex relationship and effects. And the earlier someone starts to try to understand the interrelations, the easier it is that this understanding forms part of the behaviour of the people.

For all of these reasons the teaching of the meaning of sustainable agriculture has to start as early as possible. Options are to start already in infantile age in playful activities and then to deepen knowledge and understanding in the following years. In order to sustain interest, new aspects have to be regularly shown to the youth.

In Germany there are already numerous ways for the youth to inform themselves about sustainable agriculture and many facilities are helping consciously and unconsciously with this.

Some examples of these possibilities are shown below:

school:

- The farm as classroom (German: Der Bauernhof als Klassenzimmer)

activities in leisure time:

- Ecological amusement park

fair trade:

- Experience farm (German: Erlebnisbauernhof) (Event of the 'Fördergemeinschaft für Nachhaltige Landwirtschaft' (short FLL) within the trade fair 'Die Grünen Woche' (the green week) in Berlin)

travel activities:

- WWOOFING
(World wide opportunities on organic farms or willing workers on organic farms)

The paper will set out the network of different possibilities to teach sustainable agriculture to the youth.

Teaching Sustainability: The Role of Education in the Creation of Sustainable Agricultural Systems

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The power of youth is that it draws upon a hope of the future and seeks not only to enjoy and utilize the here and now, but to maximize the potential and the possibilities of times to come. In an era of uncertain futures afforded by the issues of global climate change, impending energy shortages and the fears of conflicts and ramifications of possible water and food shortages, the concepts of sustainability and stewardship are finely tuned to resonate with the spirit of youth. For the youth of today nothing is more important than an understanding of sustainable agriculture because of its connection and entrainment with all of the issues that my generation, and those to come, will be forced to face. From issues of water shortages, to environmental, as well as public health concerns stemming from pesticide use, sustainable agriculture holds the key to the future. For youth the future is something that cannot be compromised.

The issue of promoting sustainable agriculture is multifarious but can be condensed into two main categories, one of which is the education of the average consumer who will never, in all likelihood, set foot on a farm. With the growing of cities and the populations that fill them, this segment of the world has become vitally important and needs to be aware of how their actions as individuals and consumers can support sustainable practices or inhibit them.

The other main component of sustainability education needs to occur within the agricultural community itself. Because farming tends to be passed on from generation to generation, the practices and strategies of farming, both good and bad, are transferred from parents to children. This fact creates a general gap in the understanding of sustainability between the communities of farmers who rely on agriculture for income and scientists who seek true sustainability to ensure food and environmental security for generations to come.

The youth of today must be informed and well versed in the benefits of sustainable agriculture so that they can initiate the changes that need to occur to reach the goal of sustainability; whether that means changing the products one buys or the way in which pesticides are used on the family farm.

Because sustainability can inherently touch the minds of youth, the process of education should occur quite naturally when the correct environment is created. Whether it is in the creation of school programs that educate on agricultural practices, or encouraging students to seek fields in biology or agricultural sciences and economics, it will happen. The biggest obstacle is simply informing people of the options that are utilized and created by sustainability as consumers and as agricultural producers.

This paper shall address the obstacles associated with the informational scarcity concerning sustainability and will explore the possibilities of a youth that would fuel through their actions, a global agricultural economy and community that values not only the resources of today, but the promise of tomorrow.

Perspectives of the Native Potato Farming in Peru

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Potato is one of the most important crops of the world, accounting for more than 90% of the territory destined to tubers. Peru is the domestication cradle of the crop, having close to one hundred species and 3000 varieties. All these varieties are the product of hundreds of years of traditional cultivation in the Andes.

The conservation of native potato varieties depends mainly on traditional agricultural systems. In these systems, potato is a subsistence crop. Farmers grow many different varieties, and even species, as a risk protection, because they depend on their crop for living. In this way, if a plague or bad weather affects the field, some of the harvest can be saved. Also, the traditional varieties come with knowledge about cultivation and uses. The usage of only animal fertilizer and *chaquitaqlla*, an Andean foot plow, is characteristic of this agriculture.

With globalization, many villages in the Andes have adopted improved potato varieties and technologies. The adoption of new technologies, like agrochemicals and machinery, has improved production, but threatens the environment. The rise in prices of agrochemicals has also provoked diminishing returns to the farmers, and the climate change is threatening to reduce even more the profitability of improved crops. Traditional varieties already have resistance to many pathogens and thrive in harsh climates. In these times of uncertainty, cultivation of traditional varieties is an option to reduce the dependence on imported goods.

The youngsters of the villages often go to study in the cities, and become exposed to the advances of modernity. As also occurs with medicinal plants, most of them aren't interested in learning about the traditional varieties. This is because the markets don't demand them; they put more value on homogeneity and high volume production than on diversity. The native potatoes are not only valuable for the farmer, but also to the consumer, because of the vitamins and anthocyanins they contain. For a sustainable potato farming using this varieties to be possible, two things are needed: the village youths have to learn about their potatoes and preserve their cultivation, and the markets must open to their consumption.

To help fulfill this last requisite, students from Peruvian universities, like UNALM, are called to study the cultivation and properties of native potatoes, and raise awareness of the benefits of eating these varieties. The study of agronomic traits of these varieties can help farmers improve the management of bigger fields, destined for commercialization. As the traditional agricultural systems are very heterogeneous, the role of students would be to go to the site of implementation and recommend the techniques that adjust better to that particular reality. In investigation, there are studies in UNALM about the properties as functional foods of some native potatoes, but their diffusion has been poor.

These last years, some progress has been made in the realization of the potential of native potato. The T'ikapapa project made it possible for farmers to sell 20 native varieties in markets of the capital. Another recent project, the native potato chips from Frito-Lay® proves that there is potential for this kind of product. This successful ventures demonstrate that these varieties are a very valuable asset and worth protecting.

Youth Interest in Sustainable Agriculture: The Example of Wheat

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The agricultural sector is the one of the main strategic sectors of the country. In this regard, sustainable agriculture is deemed an inseparable part of the safe and secure society. Agriculture, especially wheat production has not been developed sustainably. Nowadays, Mongolians are suffering from such factors as imported goods with low quality and increasingly high prices, as well as the agricultural sector's failure to provide our people with food and factories with inputs. These negative factors are retarding the development of our country. Thus we definitely understand that it is essential to develop sustainable agriculture as soon as possible in order to improve the livelihood of the citizens. One of the main problems for most countries is that there is not enough labor force to work in and develop agriculture. Mongolian youth often do not want to work in the agricultural sector. Therefore, my paper will focus on why wheat production is important for the agriculture of Mongolia, the factors which influence youth's interest in agriculture and how to promote them to contribute to the development of the agricultural sector of Mongolia.

The paper has 4 sections, as follows:

1. The current situation of agriculture in Mongolia and specifically, the role of wheat production and marketing in agriculture. The Mongolian government has announced agrarian campaigns for fallowed arable area cultivation several times since 1959, but these initiatives were not sufficient to develop sustainable agriculture. In 1959 after World War II the first campaign was announced to alleviate poverty and famine. The second campaign was announced in 1976 to provide food to the meet the increasing demand of the population. The third agricultural campaign was announced in 2008 to reduce the loss arising from price growth and to decrease imports of agricultural products from other countries. Although Mongolia used to provide our wheat needs and export wheat, today 70 percent of the wheat supply is imported. This is a sign of the hardship facing Mongolia and it requires us to pay more attention to agriculture.
2. Understanding youth's participation and interest in agriculture: The average age of workers in the agricultural sector is relatively old compared to industrial, service and mining sectors. Therefore, a young workforce is required for agriculture in the future. For example, in 2002 to 2003 the number of people employed was 402.7 thousand, which decreased to 373.8 thousand in the years 2006 to 2008. On the other hand, student enrollment in the field of agriculture is relatively fewer than that of law.
3. The factors influencing youth's interests and decision: The average salary of skilled agricultural workers was 114.7 dollars in 2007, which was low compared to the salary of workers in the service sector, who also have easier work. Working conditions in agriculture are not safe and the work are hard.
4. The last section consists of the conclusion and recommendations. I came up with several recommendations to increase youth's interest in agriculture, such as an earlier education and some type of leverages.

Participation of Youth in Product Safety Control in Ukraine in the Conditions of Joining WTO

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Food safety is one of the major elements in the well-being of a country's population. It involves a number of stakeholders, including primary producers, processing and packaging enterprises, traders, official food control services, and consumers. The official food control services play a key role in assuring food safety and have a substantial impact on the organization and activities of other stakeholders.

Ukraine's integration into the global economy by becoming member of the World Trade Organization (WTO) at the beginning of 2008 and signing the European Union - Ukraine Action Plan for 2007-2009 creates new opportunities for rural growth and regional development. These developments require Ukraine to improve sanitary and phytosanitary (SPS) management capacity to international standards. Ukraine also needs to harmonize national legislation and adopt food safety control and inspection procedures consistent with WTO SPS measures and the EU food safety acquires.

Effective national food control systems are essential to protect the health and safety of domestic consumers. They are also critical in enabling countries to assure the safety and quality of internationally traded food and to ensure that imported foods conform to national requirements. The new global environment for food trade places considerable obligations on both importing and exporting countries to strengthen their food control systems and to implement and enforce risk-based food control strategies.

This situation will require Ukrainian agri-food producers and exporters to improve quality and safety to comply with stringent EU requirements, particularly in the dairy and meat sector. As regional markets become exposed to higher quality and safer, moderately priced agricultural and food products from EU new member states, Ukrainian producers and exporters will encounter increasing difficulties in placing their products. The sector faces similar competitive pressures in the domestic market as safer, higher quality imports at lower prices become available, reducing the cost of food and pushing the local industry to become more competitive.

The national food control system can be characterized by three main components, namely: food law and regulations, official control services, as well as laboratory and examination services. In establishing this system, a leading role is occupied by the Ukrainian Laboratory of Quality and Safety of Agricultural Products (ULQSAP). The process of extending the food control system touches all elements of the system, namely: food legislation, management of food products control, communication with consumers, personnel training etc. The most suitable system should be defined while paying attention to cultural, economic, and political conditions of Ukraine.

The key role in the future international trade of agricultural products will be played by young specialists who are now students in our institutions of higher learning. Such students need to develop their ability to think critically, make good decisions and become expert managers in their field of specialization, in order to be "key players" in the field of quality and safety of agricultural products in international trade in the framework of WTO.

Promoting Sustainable Agriculture to the Youth

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During the 21st century, people across the globe have greatly benefited from the shared interest in the internet; barriers to communication are quickly diminishing. Today's youth are growing up in an ever-changing global economy. To prepare them for the many issues that the world is currently facing, such as soaring food prices, the monopolization of local farms and global warming, only to name a few, youth must be empowered to engage in educational programs that promote agricultural development.

With the constant increase of urban migration and growing separation between rural and urban communities, it is vital that our generation and those to come take action and educate youth. This paper will explore the development of a conceptual program called the Universal Youth Agriculture Education Program (UYAEP) which will utilize technology to spark and further promote global excitement regarding sustainable agriculture.

The Universal Youth Agriculture Education Program will focus on increasing excitement for the agriculture industry, promoting youth leadership opportunities and implementing a program called Agra Pals enabling international students to keep in contact with each other and share innovative ideas.

The internet has the ability to eradicate former communication barriers and in doing so, be the key link in connecting youth from both rural and urban settings around the world to one another. 1.3 billion people currently have access to the internet with Asia, Europe and the United States holding the highest usage percentages. No major breakthrough in technology known to man including the telephone, television or radio can match the speed at which the internet's popularity has grown. If the past 14 years since the beginning of the internet's widespread utilization are any indicator of what the future holds, there are no limits to what can be accomplished in the future.

It is evident that youth are the backbone of the future; this paper is meant to emphasize the importance of taking action and educating tomorrow's leaders today through the conceptualized Universal Youth Agriculture Education Program, whose goal is to promote technology and leadership.

Sufficiency in Sustainable Agriculture

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Sustainable agriculture is a long-term plan to preserve the world's well-being as a whole. This started from self-sufficiency and the use of new theory agriculture as a component.

Sustainable agriculture refers to the ability of a farm to produce food indefinitely, without causing damage to ecosystem health. Two key issues are biophysical and socio-economic. Sustainable agriculture looks at three main goals which are environmental maintenance, farm profitability, and expanding farming communities. These goals have been defined by a variety of practices and may be looked at from the vantage point of the farmer or the consumer.

To be sustainable, we started from self-sufficiency, which means to be satisfied with what we have and not take advantage of others. To that end, economic sufficiency is for us to be mindful of the environment and we must possess some knowledge of the culture and stability of the country. There are five factors to follow which are moderation, reasonability, good immunity, knowledge and morality. Although the theory of sufficient economy cannot be applied 100 percent for use under present conditions, some parts could still work favorably.

Apart from these, we should build up such social responsibilities as people caring for each other, keeping up our straight and good virtues, and also maintaining democracy in our society.

In the way of modern agriculture or integrated farming systems, the aim is for people to have what they need to survive, whether rich or poor. There are three main steps in this process, in which land and water management are given the greatest consideration. The first step is basic. It starts from the farmer who has a small area of land and we aim to create stability in their production. This will lead to a better standard of living and village development. Then the second step is to encourage farmers in the same area or district to cooperate in production, marketing, welfare and security, education, religion and social activity. After that, the last step is to help them associate with banks or financial institutions to form a foundation to meet their needs, by which they can all benefit.

To take up the next level of this new theory agriculture, we can expand the agricultural communities and step forward with a wider vision of how to develop and be stable in the long term. It will lead to sustainable agriculture that is our concern about and more of environmental issues.

So through sustainable development, which balances the fulfillment of human needs with the protection of the natural environment, all needs can be met not only in the present, but also for future generations.

Bridge to Sustainable Agriculture- Connecting Producers and Consumers by Food Traceability System

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Food safety events attract consumers' attentions repeatedly every year. The only way that consumers can recognize the products' safety is the labels attached to the product surface. However, the information provided by the label is only the food ingredients and the name of related companies. This limited information cannot fill the requirements of consumers who really care about food safety issues. Traceability System is a system that can ensure the safety and quality of agricultural products. The certified agricultural products show detailed information about cultivation, processing and transportation to customers and so can be continuously monitored by the consumers. Nevertheless, the popularity of the food traceability system is less than expected because the farmers who introduced this system are relatively unrewarded. The main reason for such status is the consumers didn't recognize this system properly.

In my opinion, the government should emphasize the building of mutual trust between producers and consumers, especially the youth. For example, consumers should be taught about every possible risk at each food producing stage by media or through community lectures. It is very important to make consumers understand and believe that the Traceability System is indeed a solution to ensure safety. Only with endorsements from the consumers can the farmers get fair rewards and so allow the success of this policy promotion. The Traceability System is a promising strategy that should reverse the current difficult agricultural situation and bring a new sustainable agriculture to the youth.

Sustainable Agriculture System in Malaysia: The Role of Precision Agriculture in Sustaining Agricultural Practices among the Youth in Malaysia

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Malaysian Agriculture is characterized by two distinct sectors, namely, the plantation sector and the smallholders' sector. Major crops planted are oil palm, rubber, rice, mixed horticulture, coconut and orchard. Over-dependence on these primary commodities has made it necessary to use large quantities of agricultural inputs such as chemical fertilizers and pesticides in order to sustain yield levels. The development of primary commodities requires the importation of large quantities of chemical fertilizers and pesticides with an annual purchase of RM 452.8 billion and RM 362.88 billion respectively in 2006 (Statistic Department, 2007).

However, in recent years, as a result of growing concern over the environment hazards imposed by agriculture, there is now a concerted effort to review the use of these inputs, to obtain information on precise scales and to place more emphasis on the use of precision agriculture in order to reduce agriculture pollution. Agriculture pollutions are composed of soil, water and air pollution. These efforts have resulted in the application of the right management, at the right time, at the right place and in the right way to achieve sustainable agriculture (Pierce *et al.*, 1994). This management strategy uses information technologies to bring data from multiple sources to bear on decisions associated with crop management (NCR, 1997).

Increasing promotion of youth awareness of the impact of precision agriculture on environmental issues will allow Malaysia to achieve a sustainable agriculture system. Transformation of techniques and knowledge from conventional to modern infield variability methods will enable farmers to produce, increase and sustain food production and environment conservation. There are extensive efforts to promote Malaysian youth to achieve sustainable agriculture by practicing precision agriculture technique.

Precision agriculture in the university curriculum emphasizes concepts, principles and practices of precision agriculture in the context of modern sustainable agriculture in relation to agricultural development technologies in the information age. It also covers measuring variability through various sampling procedures, nutrient, yield, mapping, interpolation of spatial patterns and geographical information system (GPS); Modeling and simulation of crop growth, use of remote sensing data and statistical methods of data analysis; Operation and usage of instrument such as GPS (global positioning system), earth satellite infra-red camera, space satellites, yield sensors and various kinds of computer software.

Agrohomeopathy: A Sustainable Alternative for Pest and Disease Control in Agricultural Production

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Environmental degradation is a serious global problem. The economic and social nature of current society is the true source of that degradation. Given the huge costs of destroying the environment, it is urgent to take effective actions to solve the problem or at least to reverse the degradation process.

The contribution of agriculture to the environment deterioration is significant. Agrohomeopathy is a natural, practical, effective, economical, nontoxic and nonpolluting technique that can be applied to agriculture to obtain healthy foods without contributing to the environment degradation. It is based on homeopathy's principles and methods. It follows the same rules to prepare dilutions.

It is argued in this paper that agrohomeopathy is a sustainable alternative for plant pest and disease control. It is also used in other biological processes, as those of growth bio-regulators, soils improvement and even to provide drought resistance. Homeopathy can also be applied to animal production processes.

Some experimental results are presented in this paper. They include bibliographical information, thesis and research activities undertaken at Chapingo Autonomous University (UACH). Some preliminary results obtained by members of the UACH's agrohomeopathy team are also presented.

It is worthy of note that agrohomeopathy is an emergent scientific field and consequently its theoretical and experimental foundations have not yet been satisfactorily established. However, some experimental results supports the claim that agrohomeopathy works, and has a convincing effect in ameliorating the process of environmental degradation.

Modified Cassava Flour as Indigenous Processed Food to Strengthen Food Security

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Food security plays a vital role in the development of a country from the biological, economic, and political points of view. Food security is widely defined as a situation in which all households have both physical and economic access to adequate food for all members, and where households are not at risk of losing such access. Food security consists of several aspects including availability, which covers production, distribution and consumption, and food problems such as poverty, which are linked to one another. Several solutions may be proposed to solve food security problems such as *in situ* food diversification and income leveling up activities.

In situ food diversification activities are purposed in order to strengthen national food security through agricultural practices based on local commodities. Here, *in situ* means original place. Therefore, these activities are centralized using local commodities in their original place. Those local commodities are processed to increase their economic value and income generation for local communities.

One of the crops with the highest potential for *in situ* food diversification is cassava. Cassava has high productivity rate up to 155 quintal/ha. Its high productivity has placed cassava as second rank to other high productivity agricultural products such as potato, sweet potato, peas, corn, and soybean. Data from Indonesia's Center of Statistics Bureau (BPS) showed that production rate of cassava in Indonesia reached 13.3 million tones in 2005. Cassava production is widespread in all regions in Indonesia. In addition to direct consumption by cooking, cassava can be processed into various products such as tapioca flour (45%), chips (55%).

One derivative of cassava, which has bright prospects in the future, is Mocal (Modified Cassava Flour). Mocal is modified cassava flour which is processed through fermentation, drying, grinding, and mashing. The difference between Mocal process and the usual cassava process is fermentation process in early stage. Fermentation process increases the quality of the flour in terms of better taste, flavor, and appearance (whiter) as well as increase in its sensory appeal. Mocal has starch content 3% higher than usual cassava flour so it can increase production yield in its derivate products. It also has some characteristics which are similar to wheat flour so it can be substituted partially or totally. Recent study showed that Mocal can be substituted for wheat flour in instant noodle processing by up to 25%, in bakery products up to 30%, and in biscuits up to 100%.

The utility of Mocal hopefully can give multiple effects to farmer's welfare. In order to do that, industrialization and technological development from laboratory scale into industrial/commercial scale are needed. Implementation of technology into commercial scale needs an integrated framework with food industries. This framework will give benefits to farmers. A model proposed for this framework is "BUMP" (Badan Usaha Milik Petani/Farmer's Enterprise) to process cassava into Mocal. Farmers can increase their income by selling Mocal to industries willing to develop various products from it.

Sustainable Agriculture and Rural Development in Viet Nam

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With 80% of the total population and 70 % of the workforce living and working in rural areas in Viet Nam, rural development is considered the most important factor to maintain the sustainable development of the nation. Rural agriculture has contributed 30% of the total exports and 25% of total GDP. The majority of the rural population makes its living by growing and selling crops (rice accounts for 45 percent of agricultural production), raising and selling livestock and fish, and from forest products. Ninety percent of the poor in Vietnam, or three quarters of the population, live in the rural areas, which is why rural development and agriculture are critical to Vietnam's development.

Fully aware of the importance of the agriculture in national economy, the Government of Viet Nam has issued a set of reform policies, bringing the agricultural sector to the leading place in the renovation process. Among these policies, promoting sustainable agriculture in the rural areas is considered the key solution for the development of Viet Nam in the 21st century.

This paper focuses on three main issues. Firstly, it gives an overview of the role of sustainable agriculture in ensuring an adequate standard of living and in improving the quality of life of the poor in the rural areas. Secondly, it analyses challenges in achieving sustainable agriculture and presents some strategies in promoting sustainable agriculture in these rural areas. Finally it examines some outstanding successes in developing sustainable agriculture as well as the contribution of the youth in maintaining success in sustainable agricultural practices.

Key words: land degradation, sustainable development, household economy.

A Better World through Sustainable Agriculture

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Nowadays, in our modern world, competition is becoming significantly more aggressive. The world is moving forward at a very fast pace. New technology, software, innovations and creative and amazing inventions are newly created each day to allow us to use scarce resources as effectively, efficiently and productively as possible. Resources are being used as inputs to make outputs and products that will eventually satisfy our unlimited desires. However, as competition rises, more resources are being depleted. Thus, we need to focus on such questions as: “How many scarce resources do we deplete from our own world as a sacrifice for our unlimited desires?” or “How far do we destroy and harm our own world, the environment, and the society so that our wants are satisfy?” and “For how long will these limited resources remain and will next generations have enough to consume them?” With the same traditional practice of continuous consumption and poor stewardship, our future is dim, despite growth and development through economic activity. Thus, the term sustainable development is being introduced.

Sustainable development is not a new term, but currently, people are now become more aware of this term. The questions or problems stated above can be slowly and steadily fixed if sustainable development can be followed. This is because sustainable development is actually a pattern of resources usage that meets human needs while preserving the surrounding environment. In other words, economic development can still be achieved while social development and environmental protection are practiced, so preserving as much resources as possible for future generations. This practice can eventually be used as a guideline to help us balance our world so that resources can be depleted as little as possible.

However, to achieve sustainable development, sustainable agriculture has to be taken into a great consideration. Without sustainable agriculture, sustainable development can hardly be achieved, since sustainable agriculture has great impact on the economy, the country’s income as well as the standard of living. It also influences society in such areas as health issues and safety, as well as environment.

In conclusion, sustainable agriculture plays an important role in our society and our economy as well as our environment. If sustainable agriculture is followed and practiced, sustainable development can be more easily achieved. This can then lead to a better society, making our world a much better place to live.

Promoting Environment-Friendly Agriculture Using School Meals Program

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The legislation for environmentally friendly agriculture in Korea aims to build a sustainable agriculture that seeks harmony between agriculture and the environment.

Recently, due to various support policies, the number of farm households practicing environmentally friendly agriculture has increased rapidly since 2000 at an annual rate of over 50% every year to comprise around 6% of total farm households. In 2007, market size of environmentally friendly agricultural products is estimated to constitute approximately 5~6% of the total market volume of agriculture products. The biggest problem is that consumption is smaller than the supply of environmentally friendly agricultural products in Korea. One of the causes is that the advantage of price (price premium) isn't working and that makes the development of such agriculture difficult.

We should find a way to promote consumption of environmentally friendly agricultural products. School meals program is one of the programs to promote consumption of environmentally friendly products and the 'Environmentally Friendly Agricultural School Meals' campaign is one of the good examples in Korea. To use environmentally friendly agricultural products in school meals has many meanings. The use of such products can secure the safety of food and further promote the consumption of environmentally friendly agricultural products. Because of this, the environmentally friendly agricultural products market will be expanded. Moreover young students can have opportunities to know about sustainable agriculture by eating and touching (experiencing) food that is made from environmentally friendly agriculture products.

Sustainable Agriculture from Fishery

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The basin of the Abashiri River, a first-class river in Hokkaido, the north island of Japan, is 1380 km². There is a lot of forest around the upper stream, many stock farms and sugar beet farms throughout the whole of the basin and many kinds of fishery in Lake Abashiri and estuarine areas in the lower stream of the river. Thus the Abashiri River can be called a kind of ecological system, which includes a continuous series from forest to sea. Recently, a lot of nutrients flow down from forests, farms and urban district around the upper stream to the sea through the river in Japan. This is causing ecological problems in the lower stream; eutrophication makes water-bloom and destroys the natural water condition for aquatic organisms. In the Abashiri River, similar problems are occurring.

The Conservation Program of Fishery Ground in Abashiri City reported that the causes of eutrophication of Lake Abashiri are murky waters flowing into the lake from the surrounding farms by cataracts and bad water condition made by the topsoil erosion caused by unplanned deforestation. Amelioration of water retention and carrying capacity of nutrients in the topsoil is required to prevent soil erosion by using organic fertilizer and/or micro-edaphon. Some farmers in Tsubetsu Town have started using scientific methods, following the Soil Research Union's recommendations to improve the soil in the farms.

Though the feedback from agriculture to fishery is already actualized, the feedback from fishery to agriculture may not be sufficient. Then what can we do to improve this situation? In Hokkaido, many salmon used to swim down from the river to the ocean, grow to full size and swim back to the river. This could function as natural nitrogen transformation from the ocean to the land in the nitrogen cycle.

However it is unknown whether nitrogen transformation is sufficiently functioning through salmon, recently. Now many salmon are trapped in the lower stream, their eggs are taken and their fries are grown artificially and released there. So the natural nitrogen cycle may be interrupted by fishery. If we can increase the numbers of salmon which can swim up and spawn naturally in the upper stream, a kind of feedback from fishery to agriculture may be actualized. If agriculture and fishery can become sustainably related to each other, a more robust sustainable industry can be formed.

Sustainable Agricultural Development in China: Opportunities and Challenges

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China Agricultural University

With the rapid social and economical development during the last 30 years since China's opening to the outside world, China's agriculture as a whole has developed amazingly. Meanwhile, China is still a developing country with the largest population in the world. Agricultural development in the country has encountered many obstacles in the new century, such as water shortage, reduction of arable land, irrational use of fertilizers and pesticides, land degradation, etc, apart from the uncertainties brought about with global climate changes. Facing such challenges and to meet increasing demand for the better and enough food supply, the conventional agriculture has to be converted to a sustainable agriculture which comprises sustainability of agricultural production, sustainability of the rural economy, ecological and environmental sustainability within agricultural systems and sustainability of rural society, along with an increase in food production. In a word, sustainable agriculture aims at unification of economic, environmental and social benefits.

There are various factors which have an effect on sustainable agriculture development, including natural, economic and social factors. Measures needed to promote sustainable development in China are discussed.

Firstly, the concept of sustainable development should be built up in the society, especially among the farmers. Then, policies to encourage development are needed to promote the process. A new role for the state should be created. Policy options related to rural fiscal reform, domestic marketing, resource pricing, environment protection, and family planning are considered. Also, science and technology application is to be highly valued in developing sustainable agriculture in China.

As agricultural students, there are especially wide ranging missions for us .We have the responsibility to play a positive and effective role in the development of sustainable agriculture. It is necessary for us not only to work hard and to collaborate in order to gain more knowledge of modern agricultural technologies, but also to take part in social practice.

Adequacy of Rural Properties Promoting Sustainable Agriculture to the Youth

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Among the key challenges that the next generations will need to face, the production of food for a growing population and the preservation of natural resources for future generations are being treated as major themes. In the discussion of such issues it is important that they are discussed together, taking into account the consequences of one over the other. In this context Brazil occupies a prominent position as a major food producer in the world, but negative aspects of Brazilian agriculture such as the use of inappropriate agricultural practices, the advancement of harvest areas over Amazon biome and the presence of rural workers in precarious situation, are antagonistic to the path that will lead to sustainability. "Modified Areas" are generated from natural systems modification by human activity, which can have its production capacity improved, maintained or decreased in relation to the system. The degraded areas are closely linked to the degradation of soil and inadequate management practices. Soil degradation, through the reduction of land productivity or even prevention of cultivation, is a socioeconomic damage to the current generations and it represents a huge risk for future ones. In the case of the Brazilian Savannah (Cerrado), the land occupation aimed at economic expansion, has been drawing attention both by its irrational process and catastrophic impacts on natural resources. The city of Lucas do Rio Verde, located in the central region of the state of Mato Grosso has developed a program which through the rural adequacy of the agricultural properties, is intended to exclude social and environmental liabilities of the agricultural sector of the municipality. In addition to the benefits from the recovering of natural vegetation, the project "Lucas do Rio Verde Legal" promotes local agricultural production by giving credibility to producers and winning the consumer's confidence. At a time when agricultural production in the center-west region of Brazil is being criticized because of its indiscriminate expansion over areas of the Amazon forest, this pioneering program emerges as a guideline for the future development of the rural processes in Brazil. This work aims to demonstrate the importance of the practices of socio-environmental suitability for the agriculture production in the Brazilian Central West, especially in transitional areas between the Brazilian Savanna and Amazonian biomes. How such programs can reduce the impacts of farming in the region and promote qualitative and sustainable development for the future, are questions to be explored in this review. The development of this study included a visit to the town of Lucas do Rio Verde, where the program is being implemented, and a meeting with the leaders who coordinate the project in the city. It was therefore possible to gain an understanding of the achievements and challenges facing this initiative. Finally, a discussion of the possibility of the transference of this model to other regions will show that it is also possible to ensure the sustainability of Brazilian agricultural production, thus preserving natural resources for future generations.

Promoting Sustainable Agriculture to the Youth

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Nowadays, every country faces problems such as shortages of food, gas and natural resources. On the other hand, global warming is the most important problem that we should all seriously address. Some scientists have reported the impact of global warming as an increase in natural disasters (climate forest fire, flooding, cyclone, drought, etc.). Thailand is also confronted with such problems. If all of us ignore these problems, natural disasters will become more serious. Not only governments but all of us should be aware and try to solve problems.

There are many different ways to solve problems for each country; depending on climate, geography, and culture. For Thailand, His Majesty the King introduced two theories to his people: the Sufficiency Economy and the New Theory of Agriculture. The Thai government is trying to apply the two Theories through legislating and providing resources to solve national problems. First, the government enforces all educational institutions to add the idea of the Sufficiency Economy and the New Theory of Agriculture in every curriculum. Then the government arranges workshops and projects to disseminate the knowledge to Thai farmers and the general population.

The Sufficiency Economy is an idea of how to live sufficiently. There are five main ideas; living sufficiently, living reasonably, being ready for future changes, applying knowledge to everyday life and having morals. In the same way, the New Theory of Agriculture is the way to apply the Sufficiency Economy for Thai farmers in real life. There are many important ideas in the New Theory of Agriculture. One is to grow various kinds of plants in order to decrease outer risk factors and to distribute risks, and to allocate farm land in four proportions: 30% for water reservoirs, 30% for rice, 30% for perennials and 10% for building, and to use natural materials as pesticides. The Sufficiency Economy and the New Theory of Agriculture can fit well with everyone's lifestyle, not only that of the Thai people. If everyone practices and applies them to everyday life, everyone will be contributing. If every single person follows these guidelines, there will no longer be problems at the individual level. All the problems in the world can be solved if we cooperate.

As a student majoring in agricultural biotechnology who has studied about the Sufficiency Economy and the New Theory of Agriculture for many years, I have already applied the idea of the Sufficiency Economy to my everyday life. For example, the Sufficiency Economy has taught me to save money for the future and to spend money only for necessities. After I graduate from Kasetsart University in three years time, I will disseminate my scientific knowledge about agricultural biotechnology to develop my country. I wish to do some useful research to improve crops for Thai farmers. The improved crops, which will be highly productive, will not need chemicals and therefore the environment will be less contaminated. I would like to take care and be responsible in the society. So I will participate in activities or projects that encourage knowledge exchange in the community.