Booklet

Project Work in Turkey from 10th – 17th May 2014

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Part I Organic Farming

1 Definition

Put simply, organic farming is an agricultural system that seeks to provide you, the consumer, with fresh, tasty and authentic food while respecting natural life-cycle systems.

To achieve this, organic farming relies on a number of objectives and principles, as well as common practices designed to minimize the human impact on the environment, while ensuring the agricultural system operates as naturally as possible.

Typical organic farming practices include:

- Wide crop rotation as a prerequisite for an efficient use of on-site resources
- Very strict limits on chemical synthetic pesticide and synthetic fertiliser use, livestock antibiotics, food additives and processing aids and other inputs
- Absolute prohibition of the use of genetically modified organisms
- Taking advantage of on-site resources, such as livestock manure for fertiliser or feed produced on the farm
- Choosing plant and animal species that are resistant to disease and adapted to local conditions

- Raising livestock in free-range, open-air systems and providing them with organic feed
- Using animal husbandry practices appropriate to different livestock species

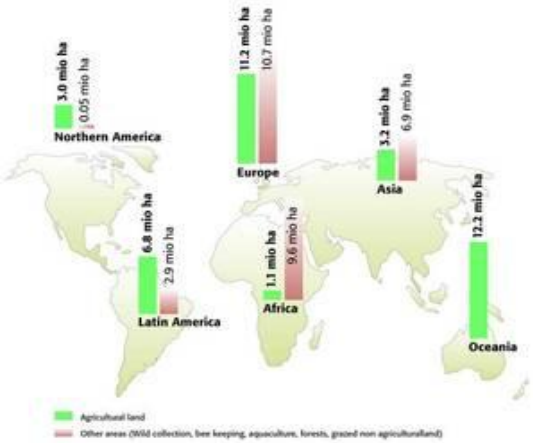
But organic farming is also part of a larger supply chain, which encompasses food processing, distribution and retailing sectors

and, ultimately, you. So every time you buy an organic apple from your local supermarket, or choose an organic wine from the menu at your favorite restaurant, you can be sure they were produced according to strict rules aimed at respecting the environment and animals.

2 Organic Farming across Europe

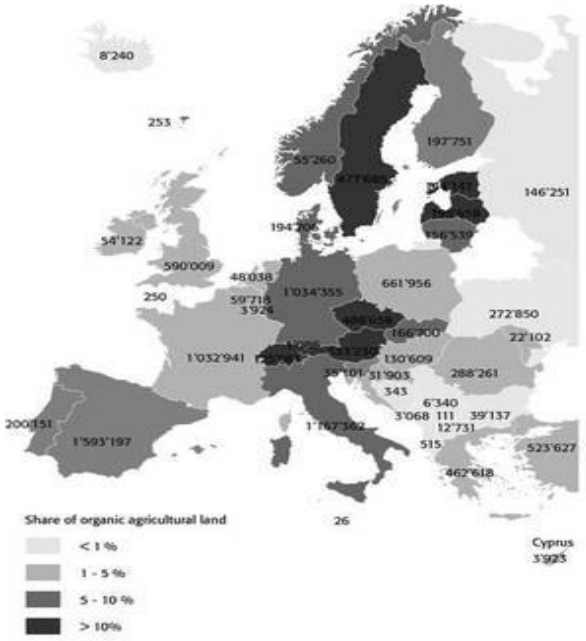
Today, in Europe and in the rest of the world recognized alternative to intensive farming, which was strongly influenced by ecological principles. According to surveys SOEL the area of organically farmed land in 2005 was estimated at more than 31 million hectares.

The largest area is located Australia, as well as in China and Argentina. The largest share of organically farmed soils of the total area of agricultural land was registered in Oceania (39%), followed by Europe (21%) and Latin America (20%).



2.1 Regulations of organic farming in the European Commission

The EU organic sector is developing rapidly. On average over the past decade, the area of organic farmland in the EU increased by half a million hectares - every year. There are now over 186,000 farms cultivating organic farmland across the EU.



Organic action plans are a further important support measure for organic farming.

The European Action Plan for organic food and farming was launched in 2004. The information campaign proposed in the plan (Action 1, a multi-annual EU-wide information and promotion campaign to inform consumers, public institution canteens, schools, and other key actors) was implemented in July 2008.

In June 2007 the European Council of Agricultural Ministers agreed on a new Council Regulation on organic production and labelling of organic products. This Council Regulation contains defines goals, principles and general rules for organic production.

In January 2013, the European Commission announced a public consultation for the review of the European policy on organic agriculture. All citizens, organizations, and public authorities who have an interest in a review of the European policy on organic agriculture are welcome to contribute to this consultation. The consultation runs from January 15, 2013 to April 10, 2013. In this

consultation, the European Commission would like to gather views on how best to develop organic farming. Key issues are:
simplifying the legal framework while ensuring standards are not watered down; coexistence of GM crops with organic farming; better control systems and trade arrangements for organic products; and impact of the new labelling rules. Other issues are the European action plan, controls and imports.

According to the EU legislation, producers of packaged organic food must use the EU organic logo (as of 1 July 2010). The use of the logo on organic foods from third countries, however, is optional. When the EU organic logo is used, the place of production of the agricultural ingredients must be indicated.

As with any food, organic produce is often sourced from other regions or countries, and may come from outside the EU altogether. While organic farmers and processors generally prefer to sell their products as nearby as possible, some products simply cannot be produced everywhere because of climate or geography.
Typical organic products imported into the EU include:

- coffee from Brazil
- kiwi fruit from New Zealand
- rice from Thailand
- bananas from Costa Rica
- cocoa from Peru
- pineapples from Uganda

As demand for organic products in the EU currently outstrips supply, customers in the EU need to be able to buy organic food and drink from further afield.

Regulation of organic imports

The EU regulates both organic food and drink produced and/or processed within the EU and organic goods from elsewhere (Commission Regulation (EC) No. 1235/2008 with detailed rules concerning import of organic products from third countries). These can readily be imported from non-EU countries whose rules on organic production and control are equivalent to the EU's - currently Argentina, Australia, Canada, Costa Rica, India, Israel, Japan, New Zealand, Tunisia, Switzerland and the USA.
For all other non-EU countries, importers can have their organic products certified for import into the EU by independent private control bodies approved by the European Commission.

In some cases individual EU countries may allow importers to import certain organic products if they can prove that these meet EU or equivalent requirements and have been inspected accordingly (up to 30 June 2014 only). These products must be accompanied by an import certificate, which is checked upon entry into the EU. This means you can buy organic products from outside the EU, safe in the knowledge that producers have had to pass inspections throughout the production process.

Essentially, EU regulations give consumers the confidence that when they buy organic products equivalent rules have been applied at every stage of the supply chain, wherever the products may come from.

Exports of organic products

The EU produces some of the world’s most sought-after delicacies. As these products are increasingly made from organic ingredients, the EU seeks to ensure that exporters can access foreign markets without encountering barriers to trade.

International trade in organic goods not only allows people in the EU to enjoy exotic new products from outside the EU but also enables EU organic products to be appreciated and recognised around the world. The EU has secured recognition of EU organic rules in several important export markets including Australia, Japan, Switzerland, Canada and the USA. Having EU organic products recognised in non-EU markets is a key priority for the future.

2.2. Organic Farming in our Partner Countries

2.2.1 Czech Republic

In the Czech Republic, the development of organic agriculture to allow democratic changes in society after 1989. This republic is located on the tip of the new EU countries and ranks the world's leading position in the areas used in organic farming.

The largest share of organically farmed land, however, consisted of grassland, cropland, orchards, vineyards, and other areas. The driving forces in development of Czech organic farming (OF) are: subsidies paid within agroenvironmental measures, the interest of traders in organic raw materials and development of the Czech organic market. The Czech Republic has a sufficient number of experts in organic plant and animal production and organic food processing and marketing. Consultancy and education are also well developed. There are accredited advisory, inspection and certification organizations.

At present approximately 450,000 hectares of land are farmed organically, which represents 10.5 % of the total agricultural acreage. In this respect the Czech Republic is above the EU average. There are about 3,500 Czech agricultural enterprises varying significantly in size, with predominantly grassland. Ho-

wever, the number of cash crops producers has been increasing. There are small organic farms e.g. of just 5 hectares, but also whole former cooperatives or state farms with acreage over 1000 hectares. The Czech Republic is the leader in the field of organic farming among new EU members. Every year 1 billion CZK (40 million EUR) is paid in the form of subsidies to organic farmers. We organize European conferences (e.g. Bioacademy, FQH Conference or the International Scientific Conference) and we have experts for international cooperation. The Czech “Organic Agriculture in Practice” handbook has been translated into English and Russian.

The main role in the development and concept of organic farming in CZ is that of the Czech Ministry of Agriculture (MoA) where a department for Organic Farming and the Environment has been established, employing five OF specialists. Development of Czech organic farming until 2015 is determined by the Action Plan approved by the Czech Government in December 2010. The MoA has also established the Czech Technology Platform for Organic Agriculture which is managed by Bioinstitut Olomouc, specialising in OF. The key role of the MoA is to guarantee and subsidize OF. As in other EU countries, subsidies are paid out within the Rural Development Plan. Organic agriculture is programme No. 1 in so-called agroenvironmental measures. Supervision of payments is carried out by the State Agricultural Intervention Fund (SZIF) – an accredited payment agency. Su- pervision of organic farming is carried out by the MoA; official inspections are the responsibility of ÚKZÚZ – the Central Institute for Supervising and Testing in Agriculture. Besides this, there are three government-authorized private organisations for inspection and certification in the Czech Republic (KEZ, ABCert and Biokont). Czech organic farming rules are adjusted in accordance with European Council Regulation (EC)

No. 834/2007 and Commission Regulation (No. 889/2008), and with Czech Act No. 242/200.

Basic statistical data (31. 12. 2010)

	31. 12. 2010	31. 12. 2009	31. 12. 2008	31. 12. 2007
Organic Processors	626	497	410	253
Organic farms	3 517	2 689	1 834	1 318
Total organic area (ha)	448 202	398 407	341 632	312 890
Share (%)	10.55	9.38	8.04	7.35
Arable land (ha)	54 937	44 906	35 178	29 505
Permanent pasture (ha)	369 272	329 232	281 596	257 899
Permanent culture (orchards) (ha)	5 128	3 678	2 764	1 625
Permanent culture (vineyards) (ha)	803	645	341	245
Permanent culture (hop production) (ha)	8	8	0	0
Other land (ha)	18 054	19 890	21 753	23 616

This table shows current basic statistical data on organic farming at 31.12.2010. The number of organic farmers increased significantly during 2010. At 31.12.2010 there were as many as 3,517 companies farming a total of almost 450,000 ha which represents over 10.55 % of total Czech farmland. Arable land acreage is constantly increasing, reaching 55,000 ha which means an increase of 10,000 ha during 2010. Organic vineyard acreage has also increased to a current 803 hectares, including both European and resistant (interspecific) cultivars.

Thus, in 2010, the number of organic farms grew by 31 % and the number of organic food producers by 26 %, amounting to nearly 630 production plants. Complete and detailed statistical data for 2010 will be published in the “Organic Farming Yearbook 2010”.

2.2.2 Germany

At the end of 2012, there were 22,932 organic-production holdings in Germany farming 1,034,355 hectares of land organically in accordance with the EU legislation governing organic farming. They account for 7.7 % of all holdings, farming around 6.2 % of the total utilised agricultural area (see Tables 1 and 2).

Most organic farms in Germany have joined associations. In addition to the Bioland and Demeter associations (the largest and

oldest organic associations), there are also other associations such as Naturland, Biokreis, Bundesverband Ökologischer Weinbau (Federation for Organic Viticulture, ECOVIN), Gäa, Ecoland and Biopark.

Representatives from organic farming associations, organic food processors and organic trade founded the "Bund Ökologischer Lebensmittelwirtschaft" (BÖLW, Organic Food Industry Federation) in 2002 as the umbrella organisation of the entire organic sector.
Some of the guidelines of German organic farming associations are stricter than those laid down in the EU legislation governing organic farming. For example, pursuant to the EU legislation governing organic farming, a holding may under certain circumstances only partially convert to organic farming, whereas the organic farming associations always prescribe the total conversion of a holding. The conversion of the entire holding is a prerequisite for support in Germany.

Developments in farmland and the number of holdings over the last few years

Year	Area in hectar	Percentage of total agricultural land	Number of farms
1996	354,171	2.1	7,353
1997	389,693	2.3	8,184
1998	416,518	2.4	9,213
1999	452,327	2.6	10,425
2000	546,023	3.2	12,740
2001	634,998	3.7	14,702
2002	696,978	4.1	15,626
2003 *	734,027	4.3	16,476
2004	767,891	4.5	16,603

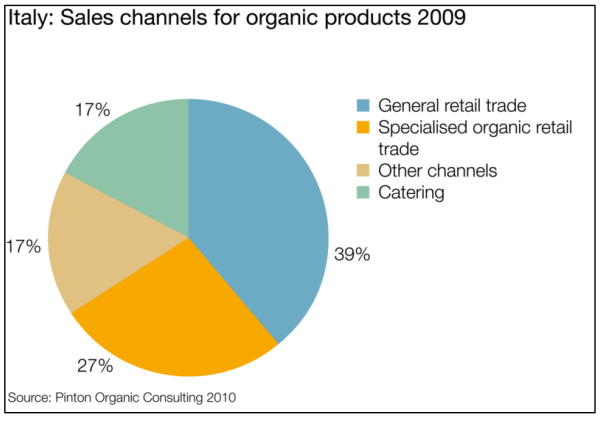
2005	807,406	4.7	17,020
2006	825,538	4.9	17,557
2007	865,336	5.1	18,703
2008	907,786	5.4	
2009	947,115	5.6	
2010	990,702	5.9	
2011	1,015,626	6.1	
2012	1,034,355	6.2	
* Due to a change in coverage in Thuringia not fully comparable with previous years			

2.2.3 Italy

For a long time, Italy was the country in Europe with the largest area of organic agricultural. However it is still the European country with the largest area of organic cropland. Large parts of organic agricultural land are in the south of the country, for instance Sicily,Basilicata or Puglia.

Almost half of the processors are, however, located in the North of the country: Emilia-Romagna, Lombardia , Veneto , Tuscany and Piemonte.

Key crop categories are cereals , green fodder from arable land, olives and grapes. Between 2008 and 2009, strong growth was noted for high value crops like nuts, citrus fruits, vegetables, olives and cereals.



The key targets of the plan are to position Italian organic products on the global market, to support and develop organic production and related supply chains, enhance consumer information, and to improve services to the organic sector. The plan does not have a quantitative target, which many other countries have.

2.2.4 Turkey

What began as demand from EU countries for organically-grown traditional Turkish dried fruits and nuts soon developed into a growing phenomenon. Today, organic produce is making its way into Turkish grocery stores and markets, responding to the Turkish consumers' increasing awareness about the harm posed by chemical fertilizers and reckless farming practices.The Ecological Agricultural Organization (ETO) was established in 1992, and the first national regulation on the production, processing and marketing of organic goods was passed on December 18, 1994. Since then a host of laws and regulations have been passed to put a rein on organic farming – Department of the Alternative Agricultural Production Techniques (2003); Law of Organic Farming (2004), By-Law on Principles and Application of Organic Farming (2005); Regulation on Principles an Application of Organic Farming (2010). Department of Good Agricultural Practices and Organic Farming (2011).

The Ministry of Agriculture and Livestock controls the organic market. The Department of Good Agricultural Practices and Organic Farming operates directly under the ministry and is

responsible for overseeing the 81 provincial directorates as well as authorizing organic certification bodies, such as ETKO, ECOCERT, TURKGAP, EKOTAR, IMO, NİSSERT, BİO İNSPECT, ÖKO-GARANTIE, EGETAR, ANKA GLOBAL, IMC and KALİTEST.
Eastern Anatolia makes up nearly half of the distribution of organic farming inTurkey, with the Black Sea and Aegean regions following with nearly 15% each.

From 2004 to 2008, organic acreage in Turkey increase by 25 percent and organic production by 50 percent. Originally limited to just eight crops, organic agriculture has now reached more than 200. In 2010, there were 331,361 tons of organic goods produced for nearly 11,200 organic products inTurkey. This stands in stark contrast to 2002, when there were only 150 different organic products on the Turkish market.

This growth isn't all that surprising. Health concerns with regard to hormone-injected animals and low-quality fertilizers are taking a toll on the conscience of Turks, who are particularly proud of their rich agricultural history and the quality of goods they bring to both local and global markets. And as the rest of the world holds on the organic ethos, Turkey is rising to the occasion with its exported goods.
Despite farmers adaptability to the increasing demand for organic goods, there is still a long way to go. Variations in demand and accessibility are vast across the country, and given the organic sectors relative newness in Turkey, organic goods are much more expensive than conventionally-grown goods.

Luckily, the future looks bright. Organic farming requires intensive labor, for which Turkey boasts an extensive young workforce. Additionally, the country's regulatory boards, albeit independent, are closely watched by the government, keeping organic

agriculture accountable to distributors and consumers alike. And with plenty of acreage already devoid of agricultural chemicals, entrance into the field is easier than expected.

3 Advantages and disadvantages of organic farming/food

Pro organic farming

Organic farming is a way of producing food that respects natural life cycles. It minimises the human impact on the environment and operates as naturally as possible, in accordance with objectives and principles including the following:

- crops are rotated so that on-site resources are used efficiently
- chemical pesticides, synthetic fertilisers, antibiotics and other substances are severely restricted
- genetically modified organisms (GMOs) are banned
- on-site resources are put to good use, such as manure for fertiliser or feed produced on the farm
- disease-resistant plant and animal species adapted to the local environment are used
- livestock are raised in a free-range, open-air environment and are fed on organic fodder
- the life of the soil, not only for the current generation, but also for the future generations. Water pollution is reduced with organic farming

Con organic farming

- low productivity
- organically produced food is expensive
- organic food can go bad quickly
- to produce organic food, additional manpower is needed
- organic foods, especially organic fruits and organic vegetables, may be less attractive to the eyes

Part II Genetic Engineering

1 Definition

Genetic engineering is the deliberate, controlled manipulation of the genes in an organism with the intent of making that organism better in some way. This is usually done independently of the natural reproductive process. The result is a so-called genetically modified organism (GMO). To date, most of the effort in genetic engineering has been focused on agriculture.

Proponents of genetic engineering claim that it has numerous benefits, including the production of food-bearing plants that are resistant to extreme weather and adverse climates, insect infestations, disease, molds, and fungi. In addition, it may be possible to reduce the amount of plowing necessary in the farming process, thereby saving energy and minimizing soil erosion. A major motivation is the hope of producing abundant food at low cost to reduce world hunger, both directly (by feeding GMOs to human beings) and indirectly (by feeding GMOs to livestock and fish, which can in turn be fed to humans).

Genetic engineering carries potential dangers, such as the creation of new allergens and toxins, the evolution of new weeds and other noxious vegetation, harm to wildlife, and the creation of environments favorable to the proliferation of molds and fungi. Some scientists have expressed concern that new disease organisms and increased antibiotic resistance could result from the use of GMOs in the food chain.

The darkest aspect of genetic engineering is the possibility that a government or institution might undertake to enhance human beings by means of genetic engineering. Some see the possibility

of using this technology to create biological weapons. Genetic engineering is also known as genetic modification.

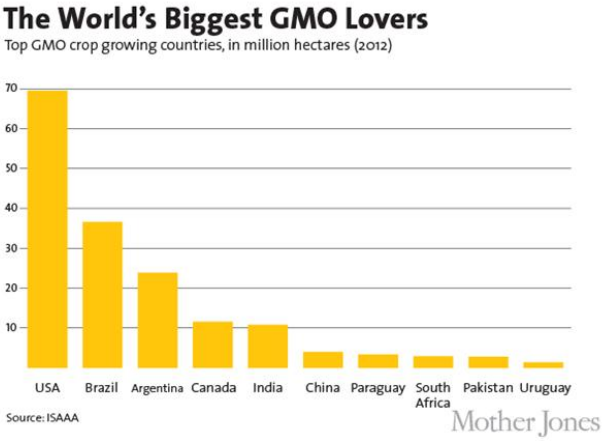
New DNA may be inserted in the host genome by first isolating and copying the genetic material of interest using molecular cloning methods to generate a DNA sequence, or by synthesizing the DNA, and then inserting this construct into the host organism. Genes may be removed, or "knocked out", using a nuclease. Gene targeting is a different technique that uses homologous recombination to change an endogenous gene, and can be used to delete a gene, remove exons, add a gene, or introduce point mutations.An organism that is generated through genetic engineering is considered to be a genetically modified organism (GMO). Their release is 'genetic pollution' and is a major threat because cannot be recalled once released into the environment.

2 Genetically Modified Organism

A genetically modified organism (GMO) is an organism whose genetic material has been altered using genetic engineering techniques. Organisms that have been genetically modified include micro-organisms such as bacteria and yeast, insects, plants, fish, and mammals. Most affected organisms are bacteria, insects, plants, fishes).

GMO‘s are used in bıological and medical research, production of pharmaceutical drugs, experimental medicine, and agriculture. The first experiment involving genetic engineering (process of manipulating genes) was conducted in 1973. The experiment resulted in recombinant bacteria expressing frog genes.

One example is the case of a toxic genetically modified potato made in Europe. Researchers found the potato, when it had been experimented on using rats, damaged their immune systems and violently stunted their growth. This started the whole debate on how harmful or helpful GMO's are. The term "genetically modified organism" does not always imply, but can include, targeted insertion of genes from one species into another.



3 Genetically Modified Food

Genetically modified foods (GM foods) are foods produced from organism that have had specific changes introduced into their DNA using the methods of genetic engineering. Genetically engineered plants are generated by altering their genetic makeup. Most affected foods are tomatos, corns, soybeans. We can't do this with natural recombination.

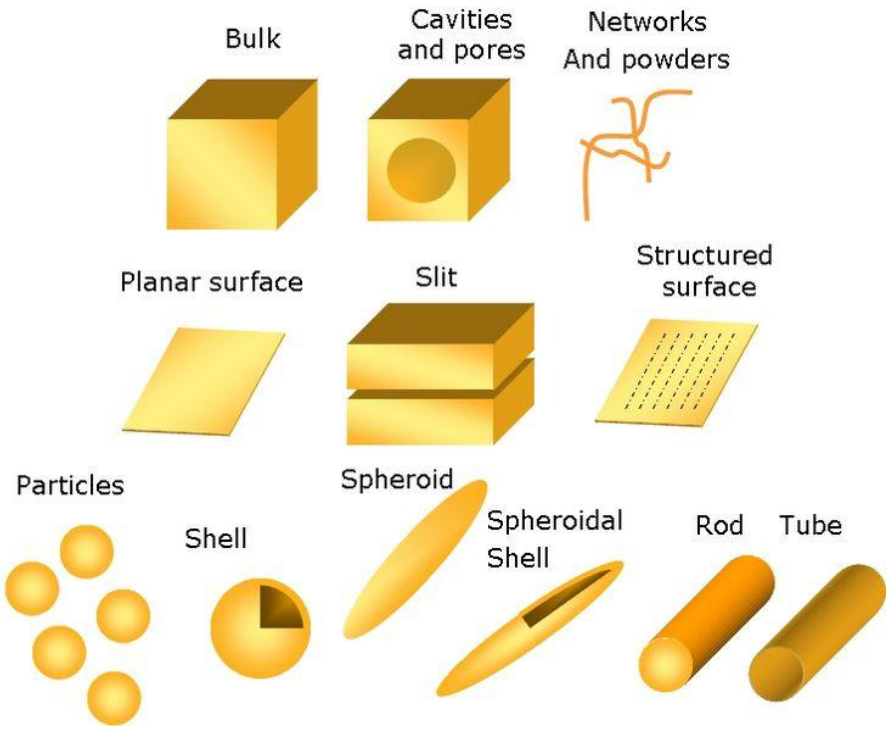
Advantages	Disadvantages
• pest resistance • disease resistance • cold tolerance • drought tolerance • nutrition	• safety is not verified yet • GMO ingredients can cause cancer • could raise new allergy outbreaks in humans • is un-natural way producing food

Part III New Technologies

1 Nano Technology

Nanotechnology is a part of science and technology about the control of matter on the atomic and molecular scale - this means things that are about 100 nanometres or smaller. [1] Nanotechnology includes making products that use parts this small, such as electronic devices, catalysts, and sensors etc. Nanotechnology is defined as the study of structures between 1 nanometre and 100 nanometres in size. To give you an idea of how small that is, there are more nanometres in an inch than there are inches in 400 milesTo give a international idea of how small that is, there are as many nanometres in a centimetre, as there are centimetres in 100 kilometres.

Typical nanostructure geometries



Nanotechnology brings together scientists and engineers from many different subjects, such as applied physics, materials

science, interface and colloid science,device physics, chemistry, supramolecular chemistry (which refers to the area of chemistry that focuses on the noncovalent bonding interactions of molecules), self-replicating machines and robotics, chemical engineering, mechanical engineering, biology, biological engineering, and electrical engineering.

Generally, when people talk about nanotechnology, they mean structures of the size 100 nanometers or smaller. There are one million nanometers in a millimeter. Nanotechnology tries to make materials or machines of that size.

People are doing many different types of work in the field of nanotechnology. Most current work looks at making nanoparticles (particles with nanometer size) that have special properties, such as the way they scatter light, absorb X-rays, transport electrical currents or heat, etc. etc. At the more "science fiction" end of the field are attempts to make small copies of bigger machines or really new ideas for structures that make themselves. New materials are possible with nano size structures. It is even possible to work with single atoms.

There has been a lot of discussion about the future of nanotechnology and its dangers. Nanotechnology may be able to invent new materials and instruments which would be very useful, such as in medicine, computers, and making cleanelectricity (nanotechnology is helping design the next generation of solar panels, and efficient low-energy lighting). On the other hand, nanotechnology is new and there could be unknown problems. For example if the materials are bad for people's health or for nature. They may have a bad effect on the economy or even big natural systems like the Earth itself. Some

groups argue that there should be rules about the use of nanotechnology.

Nanotechnology can be considered as one of the emerging technologies of the future. It is science of controlling a matter to nanometer scale. (‘Nano’ means one- billionth of meter). Nanotechnology is referred as materials and systems with structures and components exhibiting novel and significantly improved physical, chemical and biological properties due to its nano scale. During the developing stage of nanotechnology, scientist, researchers, and academicians in different scientific disciplines got involved in relevant research to improvise its competitiveness through R&D.

The given technology and science has huge potential in scientific research and technological applications. It will bring materials and instruments with itself which would be useful in medicine, computers and designing the next generation of solar panels. Adverse effects related to this technology are yet to be explored. Few predictions suggest these materials could be harmful to human health; it could affect natural systems on earth. Even at these early stages researchers believe there should be some guidelines and rules in exploring this technology.

Ideas of nanotechnology were first used in talk "There's Plenty of Room at the Bottom", a talk given by the scientist Richard Feynman at an American Physical Society meeting at Caltech on December 29, 1959. Feynman described a way to move individual atoms to build smaller instruments and operate at that scale. Properties such as surface tension and Van der walls force would become very important.

Feynman's simple idea seemed possible. The word "nanotechnology" was explained by Tokyo Science University Professor Norio Taniguchi in a 1974 paper. He said that nanotechnology was the work of changing materials by one atom or by one molecule. In the 1980s this idea was studied by Dr. K. Eric Drexler, who spoke and wrote about the importance of nano-scale events . "Engines of Creation: The Coming Era of Nanotechnology" (1986) is thought to be the first book on nanotechnology. Nanotechnology and Nano science started with two key developments: the start of cluster science and the invention of the scanning tunneling microscope (STM). Soon afterwards, new molecules with carbon were discovered - first fullerenes in 1986 and carbon nanotubes a few years later. In another development, people studied how to make semiconductor nano crystals. Many metal oxide nanoparticles are now used as quantum dots (nanoparticles where the behaviour of single electrons becomes important). In 2000, the United States National Nanotechnology Initiative began to develop science in this field.

1 Artificial Intelligence

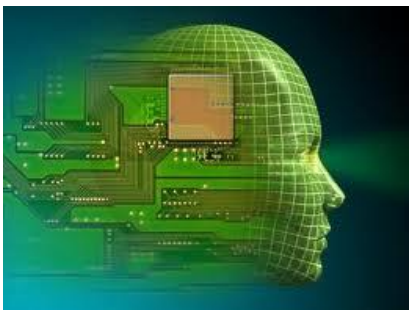
In every science-fiction movie, the producers portray the most popular scenario for the future as robots doing all the work and people just relaxing. Is it really going to be the case, i.e. will machines be smart enough or maybe even smarter than us to do the daily tasks that only us humans can do?

Nowadays, there are two conflicting ideas about the issue: Some say that machines will never have the ability to analyze some problems like humans; on the other hand, others claim that one day the machines will be driving us from house to work, cooking our food, planting the fields, harvesting the crops and they will even be

programming other smart machines. This argument brings us to the point where we need to define this ability: “Artificial Intelligence”.

Artificial intelligence (AI) is defined as programming machines so that they will have human-like intelligence. Scientists started to work on AI applications in mid 1950s. One of the first applications they worked on was to make the machine play a board game with the people, where the players need to decide what move to make at every stage. The development of AI Technology showed that it is a combination of different areas such as mathematics, physics, computer science, electrical engineering, psychology and even philosophy.

The main question is: “How do we ‘teach’ computers to think and act like us?” The answer to this question lies within different methods of AI applications such as Reasoning, Learning and Statistical Classifications etc. With a very basic explanation, machines can work on a series of “yes/no” questions and take the best action according to the given instructions. However, it has been proved that in order to achieve the complete “commonsense knowledge” that humans have, an astronomical number of “yes/no” questions will be needed. Therefore, the method for teaching the machines good and bad is done with statistical experience called “training data”. This method is called “Machine Learning”.



In addition to being the dream for the future, the AI is also in our lives now. The “Face Recognition” technology which is being used by the security camera systems is a good example of AI applications. When there’s a security

issue recorded by the cameras, the suspects are easily identified by the AI Technology. Another widely used example for the AI applications is the speech recognition technology used in call centers. We only speak to the machines and they direct us to where we want.

When we are trying to search for something on Google and start typing the name, Uncle Google completes our sentence and suggests some search options. Or, when we are internet-shopping on amazon.com (or gittigidiyor.com.tr) the site automatically suggests us different products based on what we are interested in. What technology do you think they are? Yes, right answer: AI!

To conclude, with the increasing speed of development in technology especially in AI, I believe that the future will be as portrayed in Movies. There will be no war for the resources because the machines will be producing the resources, then they will be producing new machines to work on heavy labor. Humans will have time to spend with their beloved ones since they will not be wasting time for working. I don’t know if this extend of freedom will be good for us, or it will bring us more problems, but I believe machines will be helping us a lot.