Proceeding of Sensitization Workshop on Generic Seed Issues, Ecological Agriculture and Related Laws in Ethiopia

Organized for Media People, Parliamentarians and Agricultural Researchers

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Executive Summary

In 2011, MELCA-Ethiopia has organized three distinct workshops on the subject of Generic Seed Issues, Ecological Agriculture and Related Laws in Ethiopia for three supposedly influential stakeholders in the subject matter. These are parliamentarians, agricultural researchers and media people. The workshops were organized based on the recommendation forwarded on a seed workshop organized for other stakeholders in 2010. The sensitization workshops on Generic Seed Issues, Ecological Agriculture and Related Laws were organized for media people, parliamentarians and agricultural researchers on Sept. 2, 2011, Dec. 14, 2011 and Dec. 16-17, 2011 respectively.

Five papers, entitled Agro-biodiversity Resource Base: A Foundation for Sustainable Livelihood at Present and in the Future, Practices of Learning From and Working with Farmers: The Case of Ethio-Organic Seed Action (EOSA), Sustainable Agriculture: Feasible and Resilient Option, National and International Legal Regime on Seed and Farmers’ Rights and Ethiopia’s Global Responsibility for Protection of Farmer’s Rights: Challenges and Opportunities were presented on all the three workshops by same presenters.

The paper entitled ‘Agro-biodiversity Resource Base: A Foundation for Sustainable Livelihood at Present and in the Future’ was prepared and presented by Ato Regasa Feyisa from EOSA. The main pointes reflected in Ato Regasa’s presentations were that agro-biodiversity, which consists of food and non-food values and other livelihood services, is a sub set of biodiversity. It
is a set of biological, ecological and social asset, which makes up the pillars on which livelihoods rest.

Being a biological, ecological and social asset on which livelihoods rest, agro-biodiversity is something that needs to be managed and handled with care. Management of agro-biodiversity thus will be a system management, that requires due consideration of all the elements it harbors rather than a treatment of a single or few elements in it. The basis for sustainable agriculture is management of agro-biodiversity as an integral system.

A sustainable agriculture is an agriculture that is persistent and resilient to varying climatic conditions and remains stable in its productivity to meet the food demand of a given population. And evidently, the best strategy to bringing about sustainability in the agricultural system is maintaining agro-biodiversity, including crop diversity. This calls for conservation of traditional farmers’ variety seeds and making use of related traditional ecological knowledge residing with the farmers. These, combined with modern scientific knowledge can be effectively used to address the food security problem we want to get rid of.

The other paper entitled ‘Practices of Learning From and Working with Farmers: The Case of Ethio-Organic Seed Action (EOSA)’ was prepared and presented by Dr. Bayoush Tsegaye, again from EOSA. Dr. Bayoush explained that Ethiopia is known to be one of the leading centers of diversity. The country is known, not only for its richness in diversity of crops, but also for its diverse agro-ecologies that readily accommodate different varieties depending on the specific condition. However, many farmers of the country
are not free from problems relating to supply and quality of seed. Seed related problems in the country are attributable, by and large, to limited supply of seeds, climate change, agro-ecological challenges and displacement of farmers’ variety seeds and erosion of related traditional ecological knowledge. Moreover, the tendency of replacing farmers’ seed varieties with the modern improved ones in pursuit of increasing yield per hectare is growing. As a result, the ecological, social and spiritual values attached to these varieties are gradually diminishing. And this trend will obviously have an effect on the environment thereby affecting sustainability and persistence of the agricultural system.

The third paper entitled ‘Sustainable Agriculture: Feasible and Resilient Option’ was prepared and presented by Ato Ayele Kebede from Heinrich Boll Stiftung Foundation (HBF). The main ideas raised in Ato Ayele’s paper were that, in terms of productivity, sustainable agriculture is described as a farming system capable of maintaining its productivity and usefulness to the society indefinitely. It is characterized by its multifaceted functions of addressing social, economic and environmental needs in addition to food production. As opposed to industrial agriculture, sustainable or ecological agriculture makes best use of nature’s goods and services by integrating natural, regenerative processes such as nutrient cycling, nitrogen fixation, soil regeneration and natural resistances to pests. As such, the concept of sustainable agriculture has evolved mainly as a system of production to achieve food self-sufficiency, as an idea of environmental protection and as a livelihood support system for rural communities. Proponents of sustainable agriculture agree on the idea that on farm crop diversity is its basic component.
Ato Melese Damte, from Ethiopian Civil Service University (ECSU) law faculty, prepared and presented the fourth paper, which deals with national and international legal regimes on seed issues and farmers’ rights. In his presentations, Ato Melese explained, among others, that the issue of seed, which is the fundamental component of agro-biodiversity in general and on farm crop diversity in particular, should be protected and regulated by laws for the existence of sustainable agriculture. Besides, protection of the rights of farmers as breeders and custodians of seed varieties also resides in the existence of laws dealing with seed issues.

Internationally, the development of laws dealing with seed issues and farmers’ rights, in its modern sense, starts with the advent of the Convention on Biological Diversity (CBD). The CBD recognizes, in its article 8 (J), the rights of farmers relating to not only their genetic diversity, but also their traditional knowledge and practices. Other international laws, like African Model Law (AML), International Union for the Protection of New Varieties of Plants (UPOV) Convention and Trade Related Intellectual Properties (TRIPs) Agreement have also their contributions for issues relating to seed and farmers’ rights.

Finally, Dr. Gemedo Dale, from Institute of Biodiversity, presented a paper entitled ‘Ethiopia’s Global Responsibility for The Protection of Farmers’ Rights: Challenges and Opportunities.’ In his presentations, Dr. Gemedo noted that, as a party to the CBD, Ethiopia has also national policies, laws and documents, including the constitution, dealing with seed issues and farmers’ rights. The constitution, which is the supreme law of the land, vests the right
to custody and regulation of access to natural resources, including seed, in the state and the people, while the right to related traditional knowledge and practices remain with the concerned communities. The country has also a national seed industry policy, which aims to regulate the development, conservation, production, registration and supply of seeds.

There are also other national laws, basically emanating from the CBD, to deal with access and benefit sharing, biosafety, organic agriculture system and rights of breeders. Among others, the law on organic agriculture system has the objectives of enhancing the market opportunity for the rural population as a result of increased consumers’ demand for organically produced agricultural products, and encouraging organic agriculture system, which involves less intensive use of land and the protection of biodiversity and the environment.

Although same presenters presented same presentations on the issues on all the three workshops, there were various concerns and deliberations raised in relation to the issues at each of the workshops. Some of the common concerns raised on all the consultative workshops are whether ecological farming is potentially fit to solve food security problems in the country, whether modern agricultural technologies can be entertained in ecological farming and the issue of erosion of on farm diversity as a result of displacement of local varieties. Details of the presentations and the deliberations that followed the presentations at each of the workshops are discussed as follows.
Proceeding of the Workshops

The series of sensitization workshops on the same subject, but for different stakeholders, were launched by the one, which was organized for media people, on September 2, 2011. Journalist from government and the private media have participated on this workshop. This particular workshop was opened a keynote speech addressed by Dr. Melaku Werede, an Ethiopian scientist famous for his researches in plant genetic resources. Dr. Melaku is the founder of the first Plant Genetic Resources Center (PGRC) in Ethiopia. He has received a number of national and international awards for his contribution in the field of plant genetic resources and protection of farmers’ rights, among which the Right Livelihood Award, commonly referred to, as Alternative Nobel Prize and the Herman Warsh Memorial Award are the prominent ones. In addition, there was a brief introduction about MELCA-Ethiopia and its interventions by Kirubel Teshome, advocacy coordinator at MELCA, on all the workshops.

I. A keynote speech by Dr. Melaku Werede

In his keynote speech, Dr. Melaku said that the issue of protecting and properly using farmers’ variety seeds is currently becoming a crucial issue in the field of agriculture. In doing so, the role of the media in making the issue public is irreplaceable and so it is very important to create a forum on which they can discuss the issue with professionals in the field. ‘I believe that would help them to see deep enough in to the issue and contribute their part in the process of bringing about a resilient and sustainable agricultural...
system that would enable us get rid of the problem of food security in the country’ Dr. Melaku said.

In the other keynote speech he made on the workshop organized for agricultural researchers, Dr. Melaku said, “For me, this is an exciting deliberation as it will be a discussion among researchers on biodiversity, in general, and plant/crop genetic resources, in particular, on which I have life long experience. It is my belief that the scientists and researchers from different parts of the country will use this forum as a good opportunity to have a common understanding on issue of our on farm crop diversity, problems of the diversity erosion and possible solutions for tackling it.

In my experiences I have participated in both conservation of biodiversity and improvement of crop varieties through breeding. I and my then fellow researchers have tried to work with farmers to improve the productivity of their variety seeds through breeding. And I believe we have succeeded in achieving better yield without making basic change in the germplasm of our local variety seeds. I think the researchers here have more technology and better knowledge to help our farmers get more yield by improving their own varieties. Because that is the indispensable option to maintain the on farm diversity, which our country is famous for, and also is crucial to enhance resilience and ensure food security.

I think this discussion forum is designed to examine the threats and opportunities we have in relation to seed varieties. Hence, it is my hope that you will all share the experiences in your respective areas and reach a level of consensus on the prevailing erosion of farmers’ seed varieties and possible ways of ensuring their
conservation for the common good. This will make us have a common understanding of the threats to our agro-biodiversity and join hands to work toward curbing the problem.

II. A Brief Introduction About MELCA-Ethiopia and Purpose of the Workshops

By Kirubel Teshome from MELCA-Ethiopia

MELCA-Ethiopia is a local non-governmental organization that works on conservation of biodiversity and related cultural values in Ethiopia. MELCA has three project areas in two Regional States namely Oromia and Southern Nations Nationalities and Peoples (SNNPR) regions for the implementation of its innovative approaches with the aim of disseminating them to be adapted by any interested party. MELCA is currently working at the Bale Mountains National Park and Suba-Sebeta forest in Oromia region and the Sheka Forest at Sheka zone in SNNPR.

MELCA works on five integrated program areas, namely Environmental Education (SEGNI), Participatory Mapping, Improving Livelihoods, Ecosystem Rehabilitation and Environmental Advocacy in its three project areas.

In his introduction, Kirubel raised the national and global contexts in relation to agro-biodiversity, climate change and food crisis. He stated that food and agricultural issues are high on the international agenda, especially with the increasing number of people suffering from food insecurity in developing countries. The crises in the global food security has been exacerbated by the ever
increasing environmental degradation coupled with the global climate change having a great impact on the productivity and sustainability of the agricultural system. As such finding an answer for a viable farming system that is ecologically sound and can meet the demand by the increasing global population remains to be the challenge of today's world.

He added that, when we see the national context, we find the agricultural sector to be among those severely affected by the global climate change: a vulnerable agricultural system resulting in food crisis. Today, the issue of feeding the rapidly growing population in Ethiopia through the current agricultural system has become the biggest challenge. So, it would be a problem still waiting on the desk of agricultural researchers and other concerned parties to be solved. In this regard, debates are going on as to which type of agricultural system shall the country follow to become at least food self-sufficient. Some argue that we have to use modern agricultural inputs to boost agricultural products, while others say we can increase agricultural productivity by still maintaining the organic agriculture and farmers’ traditional knowledge supported by appropriate modern scientific knowledge. There are also others who consider large-scale industrial agriculture as the best way to tackling the problem of food security.

Accordingly the overall purpose of the workshops is to sensitize the media people, and government decision makers about the significance of agro-biodiversity in coping with the impact of climate change and in ensuring food security. It will also create a forum to debate on the role of farmers’ knowledge and local seed
varieties to go for a sound agricultural policy. Same workshop will also be organized for agricultural researchers to create a forum on which researchers with varying backgrounds and from the various corners of the country come together and share ideas and experiences on seed issues, agro-biodiversity and farmers’ rights. It is also believed that this would allow them to have a common understanding of the problems relating to the agricultural system and food insecurity. Consequently the researchers would be able to contribute a concerted effort to the solution.

III. Presentation One

The first paper entitled ‘Agro-biodiversity Resource Base: A Foundation for Sustainable Livelihood at Present and in the Future is presented by Ato Regasa Feyisa, from Ethio-Organic Seed Action (EOSA). The paper generally discusses what biodiversity means and the elements that constitute agro-biodiversity, how agro-biodiversity is related with the concept of sustainable agriculture and its significance for ensuring food security at national level. It also explains how diversity on farm strengthens resistance and resilience to shocks resulting mainly from climate change.
Agro-Biodiversity Resource Base: A Foundation for Sustainable Livelihood at Present and in the Future

By Ato Regassa Feyissa from Ethio-Organic Seed Action (EOSA)

Biodiversity is defined in the Convention on biological Diversity (CBD) as a collection of genes, species and ecosystem. It consists of all life forms beginning from micro-organisms to huge marine and terrestrial animals as well as all sorts of plant species.

Agro-biodiversity is a vital sub-set of biodiversity, which encompasses the genes and species of all sorts of living things including microorganisms and the ecosystems in which they interact. Agro-biodiversity as a sub-set of biodiversity consists of many food and non-food values and services that make up the basis of livelihood for billions of people all over the world. As such it should be understood as a set of biological, ecological and social asset or capital, which should aggregately be seen as the pillars on which livelihoods rest.

Agro-biodiversity as an asset can be characterized by genetic diversity of both crops/plants and livestock, agro ecologies and climatic conditions under which it functions, knowledge and cultural practices that manage it, farming and production systems that it supports and socio-economic values and services embedded in it.

Hence, management of agro-biodiversity is a system management rather than treating one or a few elements of the system independently or partially. All the elements of agro-biodiversity,
which includes, among others, crop varieties, coastal plantations, the soil and microorganisms in it and the agro-ecology should be treated as a whole system co-existing in an integral relationship. Disrupting even a single element will result in the disturbance of the whole ecosystem. So it is only when we are able to manage our agro-biodiversity as an integral system that we may talk of a sustainable agriculture.

Sustainable agriculture is the product of harmonious functions of all elements of agro-biodiversity. Thus, we need to have a sound knowledge of the nature and content of the agriculture to make it sustainable. On farm crop diversity can be seen as the major component of agro-biodiversity. But it is by no means the only one. Agro-biodiversity also includes coastal plantations, the soil and microorganisms in it as well as the agro-ecology. So, conserving crop diversity and all the other supporting systems is a condition to have a sustainable agriculture.

Sustainability in the agricultural system is manifested in the stability of the farming and production systems. And stability in a farming system can be described as the degree to which productivity under environmental stress remains stable and reliable in terms of satisfying needs.

The most sustainable strategy to stabilize productivity under climate change condition is to increase the total farm productivity in situ. Sustaining on farm diversity is the basis for stabilizing productivity and ensuring food security. In this regard, participatory variety development practices, where
farmers and scientists work together, are proven to be good strategy.

Our farming system is characterized, by and large, by small-scale farming and on farm crop diversity. Yet, the advent of industrial agriculture or western agricultural system, which is characterized, by and large, by monoculture farming system is pushing us to look down on our long lived agricultural system.

Many people, including agricultural researchers and the government, assert that the best strategy to ensuring our national food security is shifting our agricultural system to high input agriculture. Food security involves many elements and dimensions as well as interactions, which affect individuals and nations in different ways. So we need to answer the questions, “To what extent have we invested on our system? Are we really sure that it is our farming style which is the cause to poverty and food insecurity? What kinds of food crops do we have in terms of diversity? Do we really have food security problems, considering our diverse food sources? Have we tried to identify our potentials and invest on them?” before labeling our agricultural system as backward and incapable.

As related to this, due regard should also be given to the value of farmers’ knowledge in maintaining diversity on farm and bringing about a sustainable agriculture, resilient to shocks resulting from climate change, including its impact on agro-ecological functions and its socio-economic values on which local farming communities depend for livelihood. The impacts of climate change are further described as crop diversity crisis, option crisis, health
crisis, system crisis and food crisis. So the current global food crisis is, by and large, attributable to the effect of climate change. As evidence to this, a graphic description of the global annual growth in cereal yields from 1967 to present time and till 2020 in the future is presented as follows:

![Graph of global annual growth in cereal yields](image)

*Figure 1 A graphic description of the global annual growth in cereal yields*

As can be seen from the graph, the global annual growth in cereal yields is decreasing since 1967 and will continue to do so in the coming years. The trend is mainly attributable to the ever-increasing effect of climate change.

Regarding the amount and distribution of annual rainfall, which is considered by most, as the underlying cause of food insecurity in developing countries like Ethiopia, it is asserted that in agriculture, what matters is not the amount of total annual rainfall but the seasonal and spatial distribution. In Ethiopia, for instance, data collected regarding the annual rainfall distribution
over 40 years (from 1960-2000) show that there is no significant change in the total annual rainfall amount. There is, however, a big shift in the spatial and temporal rainfall intensity; the main rain season (kiremt), which is expected to last from June to early September, is coming late in June and last until late November with some intervals. The next rainy season, on the other hand, which is Autumn/Belg is being a total failure in some parts of the country. So adapting cropping seasons to such changes is becoming today’s crucial issue.

As climate change varies over different locations affecting agriculture differently, there can be many possible ways towards adaptation to climate change and agricultural sustainability under the climate change conditions. Among others, knowledge of local farmers and genetic diversity are stated as the pillars for adaptation to climate change in agriculture. Whereas the capacity of local farmers to adapt to climate change determines the level of livelihood security at that level, the strength of the adaptive capacity depends on the available options or diversity on farms. To that end increased diversity on farms can be sustained by enhancing the use values of the diversity and its productivity, which is the most important tool to bring about stability in a farming system. And stability in a farming system is described as the degree to which productivity under environmental stresses remains stable and reliable in terms of satisfying needs. According to the presentation, an agricultural system is sustainable/resilient if:

- it is able to provide better opportunities to innovate alternatives in the face of uncertainty,
it enables build the capacity to resist accidental shocks of environmental stress,

it enables build the capacity to progressively cope with environmental and socio-economic challenges and

local genetic wealth such as farmers’ varieties are the building blocks of the adaptive capacity.

The fact that on farm crop diversity is a key factor for resilience should be underscored. And food security can only be ensured when our agriculture becomes resilient to the changing climatic conditions and the various natural shocks. The strength of adaptive capacity in agriculture depends on available options. Thus we have to consider our on farm crop diversity and our wealth of agro-biodiversity as a means for ensuring food security. The measurement for food security should be the level of richness of agro-biodiversity found in a particular location and serves as a source of food.

In general, an agricultural system with high levels of natural, social and human capital is more resilient or resistant to shocks and stresses and more persistent.

Ato Regasa also mentioned the role and importance of farmers’ participation in selection and improvement of local seed varieties as one of the good practices being implemented by EOSA. In this part, the significance of scientists’ working in collaboration with farmers and recognizing farmers as breeders have been highlighted. The fact that any agricultural research aimed at boosting productivity by making the agricultural system more
stable would be incomplete unless it gives value and space for farmers’ knowledge, which would be an indispensable input.

![Image](image.jpg)

Figure 2. Participatory variety selection in different farmers' field sites
Photo - EOSA

IV. Presentation Two

The second paper entitled ‘Practices of Learning from and Working with Farmers: The Case of Ethio-Organic Seed Action’ is presented by Dr. Bayoush Tsegaye from EOSA. The paper generally discusses about the global centers of diversity and the place of Ethiopia in relation to that and the challenges being faced by Ethiopian farmers in relation to seed. The paper also presents farmers as the banks of traditional ecological knowledge and describes some features of traditional ecological knowledge that farmers have. The paper further deals with the value of on farm diversity as a solution to shocks resulting from climate change.
Practices of Learning from and Working with Farmers: The Case of Ethio-Organic Seed Action (EOSA)

By Dr. Bayush Tsegaye from EOSA

The different crop types and varieties that we have today are results of farmers’ long term domestication, adaptation and selection efforts and the role of women in this process has been very crucial. As farming is being practiced almost all over the world for several centuries, one can assert that all countries have different crop types and varieties that they use in their farming. With regard to crop varieties, countries can be categorized in to two as Primary Centers of Diversity and Secondary Centers of Diversity. Primary centers of diversity are places where crops are originally domesticated whereas secondary centers of diversity are places where crops develop and reach status of diversity outside of their area of origin.
In relation to crop diversity, different regions of the world have been labeled as global centers of diversity for different crop varieties. Ethiopia is among the leading global centers of diversity. It is known to be a center of diversity for crops such as tef, Ethiopian sunflower, barley, enset and coffee.
Although Ethiopia is known as a center of crop diversity until recently, these days, Ethiopian farmers are facing challenges in seed supply, especially after the advent of technology affiliated agricultural inputs such as improved seeds and chemical fertilizers. Among the challenges being faced by farmers in relation to seed supply, are shortage of seed, displacement of farmer varieties which reduces available options for farmers, lack of resource to meet the demands of high input varieties, agro-ecological instabilities, loss of time-tested traditional knowledge and practices and fluctuation in climatic conditions are the major ones.

The assertion regarding problems of seed shortage and lack of option for farmers as a result of the displacement of farmer
varieties has been demonstrated by showing on farm examples of how hybrid variety seeds fail to give yield if planted for the second time and how farmers are becoming victims of adulterated seeds supplied by traders. Formerly farmers have a coping mechanism to different natural shocks by planting different varieties at different farming seasons: if they face failure in one variety type, they have an option of trying the other one. These kinds of available options are currently being eroded, as farmers are encouraged to use one or two improved varieties. Even if farmers want to use the improved varieties, many of them cannot afford paying for the high input varieties.

The problem is also related to erosion of farmers’ time tested knowledge of local variety crop management. Conservation of farmers’ varieties is a condition for the existence of related traditional knowledge. In other words it means that loss of the farmers’ seed varieties as a result of the introduction of improved varieties will obviously result in the loss of related traditional knowledge. Farmers traditionally know which variety best fits what type of agro-ecology including the season in which it should be produced. So, when loss of variety results in loss of knowledge related to it.

Agro-ecological challenges are the other problem being faced by farmers. These are mainly related with variance in soil fertility and rainfall condition. The variance, which primarily affects low potential areas, calls for seed varieties that can do well in low precipitation, less soil fertility and more resistant to disease. None of the improved varieties that are being introduced to the farmers have showed these characteristics. So the best solution to tackle
the problem is to make different varieties available to the farmers so that they will have options fitting in to the diverse agro-ecologies that exist in the country and work in close collaboration with the farmers on improving productivity of the local varieties.

Our farmers are also victims of climate change, an issue of the global community. Attributes of climate change affecting our farmers and productivity of our agriculture include late rains, prolonged dry spell or moisture stress, flooding, wheat rust etc. So all these challenges show that blanket recommendation or promotion of monoculture varieties is not recommendable for our context.

In fact currently there are signs showing that other nations who were promoting industrial agriculture and mono-cultures are becoming victims of what they were promoting and are looking for farmer variety seeds in countries like Ethiopia.

As part of the effort toward the solution, EOSA’s engagement in strengthening the informal seed supply system was presented. Some of the activities being undertaken by EOSA are reintroduction of displaced farmer varieties of major food crops and restoration of on-farm variety. Farmer varieties such as the different types of sorghum were under a threat of being displaced by improved variety of maize and wheat. These improved varieties are, however, found to be highly demanding, less productive, especially after being planted for more than one cropping season, and are vulnerable to disease. Hence reintroduction of displaced farmer varieties and restoration of on-
farm diversity have been found to be crucial problems that need to be addressed.

The other engagement of EOSA, is participatory variety selection or crop improvement. In this activity EOSA’s experts in the field go out in to the community and select the best crop seed varieties together with farmers. As the farmers are good at detecting seed varieties that are resistant to disease, can do well under low precipitation, and give better yield best seeds will be selected, breaded, if need be, and multiplied. It is believed that the participatory variety selection would offer a good opportunity to learn what kind of crop varieties the farmers prefer and why so that the best quality on farm can be enhanced. The participatory variety selection would also offer an opportunity for reciprocal learning among farmers and experts as well as transfer of knowledge from elders to the youth. Alongside with reintroduction of displaced farmer varieties and restoration of on-farm diversity through participatory selection and multiplication, introduction of new good crop types will also be conducted. This helps to boost production of selected varieties and enhance variety options for the farmers. EOSA’s experience of community seed banking aimed at supporting the local seed supply system has also been presented.

As concluding remarks Dr. Bayush stated that diversity on-farm is needed to develop new varieties to meet the needs of the future generation. And to that end, making use of farmers’ knowledge is of paramount importance. Farmers have valuable knowledge that complements the formal system. Listening to them and appreciating their valuable contribution is crucial to create
synergies. Experiences so far tell that farmers are custodians and managers of diversity. Hence farmers need to be allowed to choose their seeds and how to manage them without unnecessary interference or any barrier.

V. Presentation Three

The third paper entitled ‘Concepts and Principles of Sustainable Agriculture: The Feasible and Resilient Option’ is presented by Ato Ayele Kebede, from HBF Ethiopia. The paper generally discusses the underlying concepts and principles of sustainable agriculture and its merits as compared to the conventional or industrial agriculture. It also discusses the economic, social and ecological functions of sustainable agriculture. Furthermore the paper describes the challenges relating to sustainable agriculture and some of the possible remedies to the challenges.

Concepts and Principles of Sustainable Agriculture: The Feasible and Resilient Option

By Ayele Kebede (Program Manager Ecology, HBF, Ethiopia)

Ato Ayele started his presentation on the concepts of sustainable agriculture with a quotation from Keny Ausubel’s The Eleventh Hour. The quotation reads “When we look at the history of humanity, it is basically this relationship between the two most complicated system on earth, the human society and nature. And
at the end of the day, we all talk about saving the environment in such a way that it is misstated because the environment is going to survive, we are the ones who may not survive. Or survive in a world we particularly do not want to live in.” In short, the quotation holds the idea that environmental change in one way or the other is inevitable, and we, humans, are the ones who will perish or have to learn to live in the changed environment.

As a system, biodiversity is the largest component of the environment we live in and again, agricultural biodiversity or agro biodiversity is a vital sub-set of the wider biodiversity. Agro biodiversity is termed, as a vital sub-set of biodiversity because it is the basis for fulfillment of food, without which humans cannot survive. Genetic diversity that we have in the agricultural system today is a result of natural selection processes and the careful selection and inventive development of farmers, herders and fishers over millennia.

Humans have been engaged in farming for some 600 generations and as such one can boldly assert history, culture and community values are embedded in agriculture. Or in other words, we can say production and consumption of food has been intimately linked to cultural and social systems.

Though there are about 15,000 plants that can be used as food by humans, only about 7000 of them are used in agriculture so far. Out of these, only 30 types of crops dominate providing an estimated 90% of calories consumed by the world’s population and 14 animal species account for 90% of all livestock production. So, we can see that agriculture by its very nature is so selective
and hence the most contributor to the loss of biodiversity. Unfortunately, resent developments in the agricultural system are tending to exacerbate the erosion of agro biodiversity, rather than adding to what has been existing.

The aim of agriculture, as stated by FAO, is to provide all people at all times the food and other natural resources they need for an active and healthy life.

On the other hand, there are those who assert that a successful agricultural system based on industrial principles, has been developed over the last two to three generations, especially in terms of fulfilling the increasing demand for food. The success in the agricultural system based on industrial principles can, however, be appreciable if its harmful effects on the environment, such as loss of soil health, damage to biodiversity, pollution of water and air and harm to human health are not considered.

Industrial agriculture is characterized among others, by:
Rapid technological innovation
Large capital investment on large scale farms
Single crops/row crops grown continuously over many seasons
Uniform high-yield hybrid crops
Extensive use of pesticides, fertilizers, and external energy inputs
High labor efficiency and dependency on agribusiness

The principal philosophical underpinning in industrial agriculture is that nature is considered as a competitor that humans have to overcome. It is something that should be controlled and exploited in order to bring social good. And for that science is considered as
the best instrument free from biases. As related to this issue, it was also noted in the presentation that the current global food insecurity is attributable to the unequal and unfair distribution of wealth rather than scarcity of food. Yet the argument that which type of agricultural system, the industrial or ecological, can feed the alarmingly increasing global population is still floating. The global population, which has just hit 7 billion will project to 9.2 billion by 2050. The growing global population, combined with other crises, such as the accelerating climate change, energy crises and the rising food price could lead to a collapse in the global food systems.

So which of the agricultural systems will be able rescue the world from this serious problem by feeding the extra mouths to come, while at the same time supplying bio-energy feedstock to meet the growing share of the world's power needs? Of course without compromising the environmental health. The world needs an agricultural system that can able to feed its population while being environmentally, socially and economically sustainable.

This leads us to the conclusion that going for an industrial farming, which demands high input and energy and so has a serious collateral damage to the environment, is no longer acceptable.

Hence we need to promote sustainable agriculture based on organic farming as opposed to industrial agriculture, which demands high input and energy. Sustainable agriculture is defined as a farming system that is capable of maintaining its productivity and usefulness to society indefinitely.
For an agricultural system to be termed as sustainable, it has to fulfill social, economic and environmental functions, food production being their common denominator. In other words it means that it must be resource conserving, socially supportive, commercially competitive and environmentally sound.

![Diagram](image)

Figure 5. Social, economic and environmental functions of sustainable agriculture

As can be seen from the diagram, economic functions of a sustainable agriculture constitute, among others livelihood and food production while its environmental function is about conservation of natural resources such as biodiversity, soil and water. Socially it has to promote and protect the social capital, meaning people’s capacities to work together to solve problems and depend on locally adapted practices to innovate in the face of uncertainty. Food production appears in the center as a common denominator of all.
Yet, this does not mean that it is totally against modern technology. It can make use of all appropriate technologies. Environmentally it has to be multifunctional and contribute to public goods, such as clean water, wildlife, carbon sequestration in soils, flood protection and landscape quality. It also has an irreplaceable contribution to the harmonious relationship of the soil, plant and microbial population. Economically, sustainable or ecological agriculture makes best use of nature’s goods and services by integrating natural, regenerative processes such as nutrient cycling, nitrogen fixation, soil regeneration and natural resistances to pests. It also minimizes the use of non-renewable inputs (pesticides and chemical fertilizers) that damage the environment or cause harm to human health.

Sustainable agriculture is also seen as both a philosophy and a system of farming that reflects both ecological and social reality. Its proponents further assert that it is something based on four essential system properties: stability, equitability, productivity and sustainability.

An approach to a sustainable agriculture can be seen in many forms that can fall within the boundary of sustainable agriculture; but may have different degrees of sustainability. Among the different forms of sustainable agriculture are natural agriculture, agro ecology, organic agriculture, ecological agriculture and biological agriculture. The basic function of natural agriculture or ecological agriculture lies in its on farm diversity, which makes it resilient to shocks resulting from climate change, resistant to diseases and persistent. As described by P.Koohafkan, M.A Altieri
and E.H. Gimenez on farm diversity has its own features, functions and services.

As opposed to industrial agriculture, sustainable or organic agriculture is considered, by many, as friendly to the environment, suitable for human health and encompasses a wide range of farming systems. As such, the concept of sustainable agriculture has evolved mainly as a system of production to achieve food self-sufficiency, as an idea of environmental protection and as a livelihood support system for rural communities.

Accordingly, proponents of the idea are now promoting sustainable agricultural practices, such as crop rotation, soil and water conservation, integrated paste management and planting of leguminous crops and use of organic fertilizer or compost to improve soil fertility. So, one can boldly assert that the future fate

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**Figure 6.** Ecological role of biodiversity in agro-ecosystem function

Source: (P. Koohafkan, M. A. Altieri and E. H. Gimenez, 2011)
of global food security relies, by and large, on green or ecological agriculture.

![Diagram](image)

**Figure 7. Features of green agro ecosystems of the future: productivity, diversity, integration and efficiency**

In order for sustainable agriculture to have a real sustainability it should be based on certain basic principles: the principle of health, the principle of ecology, the principle of fairness and the principle of care. The principle of health dictates that the system should sustain and enhance the health of soil, plant animal and planet as one and invisible and the principle of ecology says the system should be based on living ecological systems and cycles, work with them, emulate them and help sustain them. In a similar way, the principle of fairness states that the system should build on relationships that ensure fairness with regard to the common environment and life opportunities and finally the principle of care concerns that the system should be managed in a
precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.

Now, what does the idea of sustainable agriculture signify for Africa in general and Ethiopia in particular?

Before ten years, the westerners have labeled the small scale and ecological African agricultural system, based on traditional farming, as backward and inefficient. But currently, there are tendencies of appreciating the African way and demanding to copy it.

Ethiopia has been declared, at the 2011 Climate Conference held in South Africa, Durban, as one of the few countries that have officially started on to follow the green growth path. The economic objective of the country has also been stated as a climate resilient green economy (CRGE). It envisions middle-income status by 2025 in a climate resilient green economy and plans to follow a green path that fosters development and sustainability to achieve that status. As stated in the document issued by the government of FDRE, the green economy plan is based on four pillars:

Improving crop and livestock production practices for higher food security and farmer income while reducing emission
Protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks
Expanding electricity generation from renewable sources of energy for domestic and regional market
Leapfrogging to modern & energy-efficient technologies in transport, industrial sectors and buildings
Thus this is an indication that there is a move, at a policy makers level, to make the economy based on sustainable and natural agriculture friendly with the natural environment, productive, beneficial to poor farmers, and will allow adaptation to climate change as opposed to high input industrial agriculture.

In general, the underlying principle of sustainable agriculture is the use of farming techniques, which are based on an intimate understanding of nature’s ways of working and survival. A sustainable agriculture that is biodiversity based and culturally perceptive is resilient, productive beneficial to poor farmers and will allow adaptation to climate change.

VI. Presentation Four

Ato Melese Damte, assistant professor at Ethiopian Civil Service University (ECSU) Law Department, presented the fourth paper, entitled ‘National and International Laws on Seed Issues’. The paper generally discusses national and international legal frameworks as well as policies dealing with seed issues and the rights of farmers and other breeders in relation to this. The paper also discusses the underlying principles of seed laws.
National and International Laws on Seed Issues

*By Melese Damte, Asst. Prof. ECSU*

**Basic Concepts of seed and seed laws**

Seed is a fundamental component of the human dietary system. As such it is one of the important assets that human beings have to properly manage and handle with care. The roles played by the farming community, for the past several centuries, in the selection and development of seed varieties is tremendous. The variety selection and development, however, varies from country to country, and even within communities of same country, depending up on the culture, agro-ecology and traditional farming practices of the communities.

Ethiopia is one of the few countries endowed with seed varieties. Though the country has immense bio-diversity, only a small number of the species have been cultivated so far. Yet, it is one of the Vavilov’s centers of diversity as it is center for some of the world’s major food plants such as barley, castor bean, coffee, onion, sorghum and wheat. Traditional crop varieties have multitudes of genetic diversities; they are a primary source of new resistant germplasm for both farmers and breeders. The genetic evolution of cultivated crop is closely interwoven with the evolution of human civilization and crop husbandry.

Regarding the history of seed, there are three historical phases of seed selection: sub-conscious selection, deliberate selection and purposeful selection.

From the three phases of seed selection, the deliberate and purposeful selection practices are the ones widely operating these
days. In line with the technological developments in the agricultural sector and the growth of research on seed varieties, it became necessary to regulate seed exercises with law, at both international and national levels. Once the need to regulate the seed issue by law is determined, the main argument around seed laws becomes the issue of ownership. *Who is the real owner of seed?*

Seed is an irreplaceable input to an agricultural activity. No one can think of farming and food production without seed. As farming communities are the primary breeders and custodians of seed varieties, no question that they are the real owners of seed. As such any law dealing with seed issue shall take the protection of farmers’ rights in to consideration.

Hence, we need to address the question “What kinds of seed policies and laws do we need for the protection of farmers’ rights?”

There are underlying principles that should be used as a guide to have seed laws.

The first is the principle of diversity. For small-scale traditional farming like that of Ethiopia, specially, diversity is the number one security to natural hazards. It increases the options and the chances of adapting successfully to changing environmental conditions and human needs. It includes both diversity of seed and diversity of cultures.

The second principle is the principle of freedom of seed. Seeds are not a corporate invention. They are rather a gift of nature and of diverse cultures. Hence, farmers should enjoy the freedom of saving and sharing or exchanging their seeds without any interference from any national or international law which makes seed saving and sharing a crime. Farmers should also have the
freedom to breed new varieties. Unlike seed industries which breed for uniformity and monopolization of seed through privatization, farmers breed for diversity. Thus allowing privatization of seeds through patenting as an intellectual property violates the rights of farming communities and leads to debt, impoverishment and dispossession.

The third principle is the right of farmers to be free from genetic contamination and bio-pollution. And finally, there is the principle of protecting farmers from being victims of terminator technology used in seeds. Providing terminator technology induced seeds to farmers is an assault to the fundamental nature of seed as the source of reproduction of life and to the fundamental freedom of farmers.

**Development of Seed Laws and Farmers’ Rights**

Before, the advent of the CBD, unlike technological innovations by the global north, agricultural and other genetic resources of the global south were perceived as res communis, which means the public domain or a common property.

So, at international level, the need for seed laws was triggered by the coming in to picture of the Convention on Bio-diversity (CBD), which was found to be a good step forward to regulate the relationship between the global South, which is rich in genetic diversity, and the global North, which has the technological capacity to exploit and use it. The most notable legal provision in this regard is article 15 of the CBD, which provides that access to genetic resources shall be subject to the prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.
The CBD recognizes the rights of farmers relating to their genetic diversity and traditional knowledge and practices. Article 8 (J) of the Convention provides that parties to the CBD agree to respect, preserve and maintain traditional knowledge, innovation and practices, as far as possible, as appropriate and subject to their national legislation. The Parties were also encouraged at the third meeting of the Conference of Parties (COP III in 1996) to build capacity among indigenous and local communities for the in situ management of agricultural biodiversity (COP Decision III/11, paragraph 15f).

As a follow up of the CBD, FAO recognized the concept of Farmers’ Rights, which it defined in Resolution 5/89 as “arising from past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the centers of origin/diversity.” The FAO thus incorporated farmers’ rights into its International Undertaking, albeit in a more limited form than originally envisioned by the proponents of the concept in the developing world.

Africa had also came up with the **African Model Law (AML)**, which is a legal system to govern Access and Benefit Sharing (ABS) and community rights, including Farmers’ Rights, as appropriate for Africa’s peculiar characteristics of enormous biological and cultural diversity. The law warns African Governments, in particular, not to allow foreign driven commercial interests to undermine the survival of their people for short-term gain, at the expense of the long-term food security.

As regards farmers’ rights, the AML, under its part V, recognizes protection of traditional ecological knowledge of farmers relevant to genetic resources, their right to obtain an equitable share of benefits arising from the use of genetic resources under their
custody and their right to use a new breeders’ variety protected by law to develop farmers’ varieties, including material obtained from gene banks or plant genetic resource centers.

The AML was, however, criticized by the International Union for the Protection of New Varieties of Plants (UPOV), which was adopted in Paris in 1961 and revised in 1972, 1978 and 1991, and World Intellectual Property Organization (WIPO) for not confirming to the 1991 UPOV Convention. The convention aims to encourage development of new plant varieties by award of an intellectual property right.

The most recent UPOV Convention (1991) requires that member countries provide a monopoly of limited duration to reward for the development of new plant varieties by way of an exclusive property right, often called “Plant Breeder’s Rights” (PBRs). The goal of PBRs is to provide an incentive to individuals or companies to invest in plant breeding and grant a legal monopoly over the commercialization of new plant varieties to the plant breeder.

For plant breeder’s rights to be granted, the new variety must meet 3 criteria (distinct, uniform and stable-DUS for the 1978) and (distinct, uniform stable, and new-DUSN for the 1991) under the rules established by UPOV. The alarming thing in the provisions of UPOV is that novelty is defined entirely by commercialization and not by the fact that the variety did not previously exist. So this seems to be a clear threat to the rights of farmers’. Article 27(1) of the TRIPS agreement, on the other hand, provides that “…patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application.”
An exception to this provision, stated under article 27(2), (3)) provides that members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law. Members may also exclude plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes from patentability.

In addition, the US government has argued that the Model Law’s call for the prohibition of patents over life forms violates the Trade Related Intellectual Properties (TRIPs) Agreement.

**National Policies and Laws on Seed Issues and Farmers’ Rights**

When we come to the Ethiopian legal context, the issue of seed is addressed by the constitution though in general terms. It is stated under article 40 (3) of the constitution that ownership of all natural resources is exclusively vested in the state and in the people of Ethiopia. According to this provision, even if individual seed or plant can be a private property, the general knowledge in the development of the seed is vested in the people.

Under its article 41(8) again, the constitution provides that Ethiopian farmers and pastoralists have the right to receive fair price for their products, that would lead to improvement in their conditions of life and to enable them to obtain an equitable share of the national wealth commensurate with their contribution. This
objective shall guide the State in the formulation of economic, social and development policies. Cognizant of this, the constitution provides, under its article 89 (1) that the Government shall have the duty to formulate policies, which ensure that all Ethiopians can benefit from the country’s legacy of intellectual and material resources.

The country has also a National Seed Industry Policy, adopted in 1992. The policy recognizes the accelerated genetic erosion of local landraces due to aggressive promotion of improved exotic varieties, and notes the need to minimize such impacts through the implementation of balanced development strategies in conservation, seed production and supply of plant genetic resources. It also promotes the active participation of farmers in the seed industry for the promotion of sustainable use of local cultivars.

The main objectives of national seed industry policy are to:
- Streamline evaluation, release, registration and maintenance of varieties developed by national programs.
- Develop an effective seed production and supply system through participation of public and private sectors.
- Encourage the participation of farmers in germplasm conservation and seed production.
- Create functional and efficient institutional linkages among seed industry participants.
- Regulate seed quality, seed import-export trade, quarantine and other seed related issues.

The National Seed Industry Policy recognizes the Ethiopian Seed Enterprise (ESE), state farms, private farms and farmers as the major producers and suppliers of seed.
Following this policy, an executive organ dealing with the national seed industry is established by proclamation No. 56/1993.

The first national law dealing directly with seed issue is the Seed proclamation No. 206/2000. This Proclamation seems to be more comprehensive and tries to create stronger legal framework for the protection and control of the interests of all players in the seed industry. From the preambular statements one can understand that the main purposes of this Proclamation were:

Enabling farmers to use high quality seed particularly of improved crop varieties and making such seeds available as smoothly, effectively and quickly as possible; and

Realizing the need for creating conducive conditions for the distribution to the farmers and the wide utilization of quality seed.

According to article 3 (2) of the proclamation farmers can freely exchange the seeds that they produce either for consideration or free provided that there is no advertisement for the purpose of sale of seeds. Moreover, the Proclamation is inapplicable on seeds, which are used for other purposes (other than planting).

Articles 25 (5)(6) are provisions that have more significance from the viewpoint of farmers’ rights and from protection of biodiversity. The first sub article provides that seeds which are genetically modified through genetic engineering, shall be imported only if the Agency receives assurances from the concerned body that these seeds or planting materials are in conformity with the laws issued regarding the importation of genetically modified plants and other pertinent directives while the second sub article totally prohibits importation and sell of seed whose second generation seed cannot germinate or seed which has terminator gene technology.
There is, however, a draft seed proclamation, which, if promulgated, will substitute the foregoing proclamation. The draft seed proclamation is not fundamentally different from the existing Seed Proclamation № 206/2000. However, it has some differences from the existing proclamation. For instance, the draft proclamation introduced new terms and expressions in the definition part, such as “commercial seed market”, “genetically modified organism”, and “OECD seed scheme.” From the introduction of these new terms and expressions one can possibly guess that the Ethiopian seed law is becoming more internationalized and commercialized.

The purposes of the draft proclamation, as stated under its article 4, include production of high quality seed and introduction of improved seed to the market. As in the existing proclamation, the draft proclamation also requires the permit by the concerned authority in accordance with the relevant law, for the purpose of importing GMOs. It also prohibits the importation of seeds with a terminator gene technology.

A new introduction in the draft law is that it empowers the minister to waive the requirement of any certificate of competence in case of severe seed shortage. Unless this provision has some restrictions, it may give a leeway for the importation of unexpectedly harmful seeds into Ethiopia.

The newly adopted Growth and Transformation Program (GTP) also focuses on ‘new’, ‘improved’ and ‘modern’ seeds and technologies for the purpose of enhancing agricultural productivity. The document, however, does not clearly specify whether these technologies focus only on hybridized varieties or also on agro-biodiversity of the landraces.
The other national law dealing with seed and farmers’ rights is the Plant Breeders’ Right proclamation No. 481/2006. This Proclamation is meant to provide recognition and economic reward for plant breeders as they contribute to agricultural productivity. The plant breeders shall be recognized if they produce or develop new varieties, especially the ones different from farmers’ varieties. “Farmers’ variety” is defined by the Proclamation as a plant variety having specific attributes and which has been discovered, bred, developed or natured by Ethiopian farming communities or a wild relative of variety about which the Ethiopian farming communities have common knowledge.

Part Five (Articles 27 and 28) of the Proclamation provide for the farmers’ rights. As a matter of principle, farmers’ rights emanate from the enormous contributions that local farmers have made and will continue to make in the conservation and sustainable use of plant genetic resources that constitute the basis of breeding for food and agricultural production. Under its Article 28 the Proclamation lists down many of the farmers’ rights prescribed under article 26 of the AML. However, the Proclamation is silent regarding the provision of the AML on the obtaining of equitable share of benefits arising from the use of genetic resources by the breeders. But the Proclamation provides, under its article 14 (3), that in order to obtain the plant breeder’s right, the plant breeder, must have a proof that he has obtained the genetic resource used to develop the variety in accordance with the relevant laws on access to genetic resources. So it is important to cross-refer to the access to genetic resources law.

Still another national law is access to genetic resources and community knowledge, and community rights proclamation № 482/2006. The objective of this Proclamation is to ensure that the
country and its communities obtain fair and equitable share from the benefits arising out of the use of genetic resources so as to promote the conservation and sustainable utilization of the country’s biodiversity resources. As prescribed under article 5 (1) of this Proclamation, the ownership of genetic resources is vested in the state and the Ethiopian people. Sub Article 2 of same article continues prescribing the ownership of community knowledge is vested in the concerned local community. This law clearly explains the ownership rights of the state and the Ethiopian people on the natural resource.

The country has also a law dealing with organic agriculture system (Proclamation № 488/2006) and biosafety (Proclamation No. 655/2009). The objectives of the organic agriculture system proclamation include:
To enhance market opportunity for the rural population as a result of increased consumers’ demand for organically produced agricultural products, and
Encourage organic agriculture system, which involves less intensive use of land and the protection of biodiversity and the environment.

The objective of the biosafety proclamation, on the other hand, is to protect human and animal health, biological diversity and in general, the environment, local communities and the country at large by preventing or at least managing down to levels of insignificance the adverse effects of modified organisms.

The biosafety proclamation is meant for the implementation of the Cartagena Protocol to which Ethiopia is a party. Yet the proclamation was enacted after nearly six years from the entering into force of the Cartagena Protocol.
The proclamation provides, under its article 3 (1), a general rule that seems to appear that the proclamation is applicable to all transactions of things so long as such things contain Living Modified Organisms (LMOs). However, exceptional provision to this general rule is given in sub-article (2). This means that, even if a transit of any thing that contains LMOs is subject to the rules of the Biosafety Proclamation as per the general rule of sub-article (1), such thing is not subject to the rules of the proclamation so long as the transaction of the thing is covered under any international treaty that Ethiopia has ratified.

In other words it means that the said thing that contains LMOs must be used as pharmaceuticals for humans could be anything but must transit (that is, should not be used in Ethiopia) through Ethiopian territory; and must be declared to have no adverse effect.

This exceptional provision of the Biosafety Proclamation implies that there is no need for advance informed agreement for a person who wants to Import pharmaceuticals which contain LMOs for human use; Transit anything that contains LMOs through the Ethiopian territory; and Import anything that contains LMOs, but declared by any international treaty that is ratified by Ethiopia to have no adverse effect.

In conclusion, Ato Melese stated that we need laws, which do not impair the control of seed at the local level. Our laws must strike the balance between high level of productivity and diversity of seeds. Long-term benefits should never be compromised for short-term needs.
VII. Presentation Five

The fifth paper, entitled ‘Ethiopia’s Global Responsibility for Protection of Farmers’ Rights: Challenges and Opportunities’ is presented by Dr. Gemedo Dalle from the National Institute of Biodiversity Conservation. The paper generally discusses the rights of farmers and local communities enshrined in the Convention on Biological Diversity (CBD) to which Ethiopia is a party and relevant national law.

**Ethiopia’s Global Responsibility for Protection of Farmers’ Rights: Challenges and Opportunities**

*By Gemedo Dalle (PhD) from Institute of Biodiversity Conservation (IBC)*

It has already been discussed under the foregoing presentation that farmers are considered the custodians and managers of agrobiodiversity. As a reaffirmation of this, Dr. Gemedo stated, in the introductory part of his presentation, that farmers and rural communities play a critical and innovative role in the conservation and further development of genetic resources, and so their right to benefit from the resource deserves legal recognition. This right includes, among others, the right to save seed and exchange germplasm, the right to choose not to make their germplasm and knowledge available to others and the right to share benefits arising from making use of their genetic resources and knowledge.
The role of biodiversity in poverty reduction is immense. Researches conducted in the field confirm that conservation and sustainable use of biological resources is of critical importance for meeting the food, health and other needs of especially the rural population in developing countries. Apart from this, there is no question that biodiversity is the principal life support system whether in underdeveloped, developing or developed countries. Life and continuation of generations without biodiversity is hardly imaginable. That is why the international community has laid down an international law for protection of biodiversity, namely The Convention on Biological Diversity (CBD), almost two decades ago.

There are three major objectives that are intended to be met by the CBD: Conservation of biological diversity, sustainable use and fair and equitable sharing of the benefits arising from the use of biological resources. In its preamble, the convention underscores that conservation of biological diversity is a common concern of human kind and that it has to be an integral part of the development process. As such, the convention now stands as a landmark in the international law because it deals with issues so vital to human’s futurity.

Agro-biodiversity is one of the component parts of biodiversity. It is the basis for sustainable food production and livelihood systems especially for agrarian communities. Genetic erosion in the agricultural sector would obviously result in disturbance of the ecosystem that can seriously affect the food production. Hence boosting or maintaining agricultural productivity is something inextricably linked with maintaining genetic diversity in the
agricultural sector. Genetic diversity on farm provides species with the ability to adapt to changing environment and evolve by increasing their tolerance to shocks resulting from climate change and different crop diseases. Thus, in the agricultural sector, the effort to boost production, get rid of food insecurity and poverty reduction can not be attained without conservation and sustainable use of crop and livestock varieties. But this does not, by any means, mean that we have to totally avoid improved varieties. We have to also use improved varieties; but the use should be based on strict scrutiny of which improved variety should be used where, when and how. And above all, it should be based on the interest of farmers. So the best way for maintaining crop diversity is to use both improved variety and farmers’ varieties in parallel.

A notable weakness of improved varieties is that they are mostly vulnerable to crop disease and shocks resulting from climate change. Hence we have to have farmers’ varieties as insurance for such failures.

Conservation of crop genetic diversity is one of the top focuses of the CBD. Regarding the use of crop genetic resources out of their place of origin, the CBD requires fulfillment of mutually agreed terms between food genetic resources owners and users. To that effect, the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was negotiated to make the conservation and sustainable use of crop genetic resources consistent with this requirement of the CBD.
As one of the objectives of the CBD is ensuring the right to fair and equitable sharing of benefits arising from the use of genetic resources, and Ethiopia is one of the countries that have ratified the CBD, it has made a local legal arrangement (Proclamation NO. 482/2006) for the protection of the rights of its indigenous and local communities to their genetic resources and related knowledge. They are patented to the knowledge, innovations and practices relating to genetic resources under their custody. As such, they are empowered to allow or disallow the use of such knowledge, innovation or practice by others and, when allow, share the benefits arising from such use. Whenever other parties are allowed to make use of genetic resources, the law provides that local communities, having knowledge and practice relating to such use, shall obtain a fair and equitable share of the benefit arising out of such use. The law also recognizes the rights of local communities to regulate access to their knowledge and practices.

Although existing legal provisions are quite good enough for the realization of farmers’ rights in Ethiopia, there are challenges to the realization of these rights. Some of the challenges, as pointed out by Dr. Gemedo, are lack of awareness on the existence and implementation of the laws, lack of understanding of local structures, lack of strategic institutional arrangements, low level of farmer’s capacity and conflicting interests.

As a way out of the challenges and problems, Dr. Gemedo also mentioned that development support for small-scale farmers should be based on both the enforcement of basic rights and a pro poor development of markets.
Questions, Suggestions, Comments and Discussion

The foregoing papers were presented on the sensitization workshops organized for media people, parliamentarians and agricultural researchers separately on different days. Each of the workshops proceeded in such a way that one or two papers are presented one after the other followed by reflections, questions and discussions from the participants and a response on these, if needed, by the presenters. Accordingly the reflections, questions and discussions as well as responses by the presenters that followed the presentations on each of the workshops are presented as follows:

Reflections, Questions and Discussion on the Workshop
Organized for Media People

The sensitization workshop for media people was conducted on September 2, 2011 at Ghion Hotel in Addis Ababa. This was a workshop on which journalists from various government and private media participated. It was aimed at sensitizing the journalists on the issue of seed, ecological agriculture and related laws dealing with the rights of farmers in this regard so that they would have a wider and deeper understanding on the issues to come up with strong and triggering environmental and agricultural reporting in their respective medias.

The following are reflections, questions and discussions and presenter's responses that followed the presentations on this workshop.
Q You mentioned in one of the presentations that organic or sustainable agriculture is the best agricultural system. On the other hand we have to get more agricultural produce to meet the increasing demand for food. But how can production be boosted without the use of modern agricultural inputs such as chemical fertilizers? Or what kind of inputs do you think we should use?

Q The shifting of seasons, especially the rain pattern, which is likely attributable to the climate change is seriously affecting agricultural productivity. What do you suggest to enable our farmers make adaptation to the shifting in the seasonal rains? Do you think the government is doing something in this regard?

Q We see that environmentalists resist the importation of Genetically Modified seeds (GMOs). There are others who assert that GMOs could be solutions to the problem of productivity in some crop types. What is your position regarding the use of genetically modified seeds?

Q We have learned from one of the presentations that some of the improved seeds fail to give yield if they are planted for more than one cycle. What is the underlying reason?

Q Do you think that sustainable agriculture can be practiced through smallholder farming like the one in our country?
Q  What is the current status of community seed banking that is being practiced by EOSA at some places and how do you see its significance in terms of contributing to the seed supply?

Responses

In response to some of the questions Dr. Gemedo said that modern technologies can be used to boost agricultural productivity; yet they should be used wisely. We should carefully consider the relevance and pros and cons of a given modern agricultural input instead of rushing to apply it widely and in such a way that its application has an effect of eroding the traditional system. This is one important aspect we should consider: integrating relevant and appropriate modern agricultural technologies with farmers’ traditional knowledge. Whenever we have an option of getting the same result through the traditional system, we have to stick to that. That is so because it is good for both environmental and human health.

The other main reason for sticking to the farmers’ variety is because they are the basis for agro-biodiversity. Experiments and experiences in the field prove that improved seeds have very limited variety and that they are vulnerable to various crop diseases and natural shocks. Farmers’ varieties, on the other hand, provide a wide range of option to fit to different agro-ecologies and that they are also more resistant to crop diseases and natural shocks. Further more, it is evident that farmers’ varieties are preferable for other factors such as taste, friendliness to health
and economy. Hence, the best approach would be to integrate both varieties through breeding.

In support of Dr. Gemedo’s idea, Dr. Bayush stated that we have to also see the fact that improved seeds are demanding for many farmers. They cannot afford paying the price of the seeds and the inputs required to grow them. There is no problem if they are provided for those who can afford them.

The other thing that has to be considered, according to Dr. Bayush, is the interest of the farmers. Farmers prefer their own varieties because they use them for many purposes other than food. Many of the improved varieties fail to fulfill these needs of the farmers. The farmers also prefer their own varieties because they have seen that they are more resistant to diseases and natural shocks. And above all, we have to understand that we need diversity on farm to cope up with natural shocks resulting from the global climate change.

Ato Ayele also responded to the some of the concerns saying, “As regards the questions and concerns about sustainable agriculture, I would say sustainability is hardly possible in any sector including agriculture. We may be able to slow down or accelerate changes; but in no way can we avoid changes, especially changes in the environment. As I have already stated, environmental changes are inevitable and we, humans, are bound to vanish or adapt ourselves to the changes and live in the new environment. As agriculture is strongly linked with environment, apparently it will go through changes resulting from the changes in the environment. So I believe the idea of sustainable agriculture will
vary depending on the environmental situation we will face and that we may not have the same agricultural system some years from now.”

Regarding the concern about using GMO seeds, Ato Ayele said we have to understand the basic philosophy behind fabrication of GMO seeds before rushing to use them. As to him the producers attach the issue of food security to GMO seeds just to give it a face value, he said. I believe the underlying reason is to make seed a business matter. We have to also consider the reason why we resort to the use of GMOs when we do have ample varieties and options. Those who do not have choice other than using GMO may use it; but why do we do it? We have to see it seriously taking the advantages and disadvantages we may get. We have to also see the experience of others who used GMO seeds.

GMOs could be seen as the extreme case of breed seeds. Field experiences show that breed seeds do not give yield if used for more than one cycle. That is so because the breeders intentionally design them in such a way to ensure the continuous existence of their breed seeds in the market. It is something driven by an interest for profit.

As a concluding remark, Dr. Melaku said, “As to me, to get the best out of the agricultural sector, we have to integrate the time tested traditional knowledge in the sector with the modern one. We need both to get the best. Relying on either of the two separately will have a problem or cannot give us what we want.
Ethiopia is one of the few countries rich in agro-ecology and agro-biodiversity. These resources are a result of an experiment and production by traditional farmers, who should be considered traditional breeders. Their traditional knowledge is a knowledge tasted and proved through time. On the other hand, there is modern scientific knowledge that is developed through scientific experiments. This knowledge is also important to support and improve the traditional knowledge. So we have to try to make the best out of the two, instead of favoring one and despising the other.”

Ato Mulugeta Tafa, a farmer from Telecho Kebele in Welmera woreda, has presented his and his fellow farmers’ experience regarding the use of farmers’ varieties and improved varieties. He said, “Some years have passed since we started to use improved varieties (wheat and maize) provided by government. We were happy for the first two years because the production we got from the improved seeds were good. But after the second year the production started to decline. The land also started to demand more chemical fertilizers year after year. Further more, the crop of the improved variety became an easy target for crop diseases and lack of humidity. So we began to feel desperate. We wanted to resort to our own varieties but we do not have them since we stopped using them since the introduction of the improved varieties. So we shared the idea with MELCA, which works with us on environmental protection issues and they arranged a visit for some of the members of our community to Ejere and Chefe Donsa. These two places have community seed banking. We got some local seed variety (one kilo per person) from there and planted this along with the improved varieties. We got more local variety
from the harvest and so improved the coverage of local variety seed the following year.

While we were using the two varieties side by side, we observed that the improved variety keeps on demanding more chemical fertilizers year after year, the yield keeps on decreasing and it becomes more and more vulnerable to crop diseases such as ‘wag’. The local variety, on the other hand, do not need chemical fertilizers, is resistant to wag and gives more yield especially if planted with compost. On the market also we get more price for the local variety. So finally, as a community, we are becoming fond of our own varieties after seeing the advantages and disadvantages of both.”

Finally, Ato Argaw Ashine, former director of Environmental Journalists Association (EJA), announced a fellowship award for three competent environmental journalists. He said the purpose of the fellowship award is to initiate the private media to come up with interesting and triggering stories regarding the countries agricultural sector and underlying causes of the food insecurity. So journalists who want to compete for the fellowship award are expected to submit an impressive proposal of the story they will be producing.
Reflections, Questions and Discussion on the Workshop Organized for Parliamentarians.

The sensitization workshop for parliamentarians was conducted on December 14, 2011 at Ghion Hotel in Addis Ababa. Members of the House of Peoples’ Representatives from environmental protection, agriculture and culture and tourism standing committees have participated on this workshop. The objective was to sensitize members of the legislative organ of the country on seed and agricultural issues so that they would have a better understanding of how to shape the future agricultural system of the country.

The reflections, questions and discussion forwarded by the participants after the presentations and responses by the relevant presenters are presented as follows:

Q There are two lines of argument regarding GMOs. Some argue that GMOs are harmful to human and animal health and they are also unfriendly to the environment, and so we must avoid them. On the other hand there are others who argue that GMOs are not harmful and we have to use them especially to enhance productivity and ensure our food security. Where is your stand?

R+Q As regards to our traditional varieties there is no question that they should be conserved. But we cannot totally close our doors to the option of using improved varieties, especially considering our food security problem. Agricultural productivity can be enhanced in two ways: Through extension
or intensification. Extension refers to expansion of the farmlands while intensification refers to increasing productivity through use of technological inputs; without increasing the farmland size. If we have to avoid increasing the farmland size for the sake of having a healthy ecosystem, then do not we have to use improved seeds and other inputs to increase production?

Q Do we have to refrain from using improved varieties to conserve the farmers’ varieties? What is the purpose of conserving the traditional or farmers’ variety seeds? Is it for historical purpose? If so, how can we achieve the goal of ensuring food security by sticking to the old way?

Q Are you suggesting, in your presentations, that our farming system is not backward and should be sustained? Do not we have things to be improved?

Q Do the people and the government have equal right on genetic resources? Do the laws treat food and non-food crops differently?

R+Q. Ato Regasa has rightly put that we have diverse agro-ecologies that are fit for diverse crop varieties. There is also enormous traditional ecological knowledge that go along with these diversities. But most of the renowned agricultural experts of the country are ignorant of these. They consider the indigenous variety and knowledge as backward. As a result they give inform decision makers in the line of their thinking and influence government decision in that way. So what should
be done to allow decision makers to make an informed and balanced decision that considers all options?

Q Currently there are tendencies of making farmers specialize in one or two export oriented cash crops without considering the agro-ecological effects. Ensuring food security or producing export crops should not be done against environmental health. Otherwise whatever we do today for immediate advantage will backfire on us in the future. So what kinds of options should be considered to avoid such undesirable moves on the agricultural system?

R+Q. If we see the laws of nature, everything on this earth exists on purpose. We can easily recognize the fact that existence of one living thing is important for the existence of the other and vice versa. This implies that we should conserve our biodiversity for our own sake. Our living depends on the existence of other living things.

You said that Ethiopia is one of the countries rich in biodiversity. What is the status of our country in terms of biodiversity? How are we benefiting from the diversity?

R Regarding GMOs we have to be cautious of the political motive behind it. And most importantly our parliamentarians should be well informed of such things as they are makers of laws that affect the lives of citizens. GMOs are sometimes described as expressions of globalization. On the other side we see that globalization is an interaction that does not accommodate traditional varieties and related traditional ecological
knowledge. So it seems that globalization is designed in the interest of the westerners. We see that huge seed companies in the west are controlling the agricultural system in some countries. By controlling the food system they can control everything in a country. And they want to impose that on us in disguise of globalization and modernization.

We have to explore our own potential before giving them way. There are clear evidences that our traditional varieties, if handled systematically, can compete with the improved varieties. We have to also see the advantages we get in diversity as compared to monoculture cropping.

**Ato Mellese’s response on the comments and questions**

To begin with, I have to raise, again, the question I asked at the beginning of my presentation. “Why do developed nations subsidize their agriculture?” The reason, as to my understanding, is because their agriculture is not profitable. Since they use industrial agriculture, which is highly demanding, at the end of the day the cost of production becomes higher than the food they produce. On the other side they have huge industries, which are much profitable. So, in order to keep their agriculture moving and produce food for their people, they have to subsidize it. Hence we have to also see large-scale industrial agriculture in this light and analyze whether it fits our context or not.

We can also see the advantages and disadvantages in terms of on farm diversity. Industrial agriculture is known by production of
monoculture crops while our traditional way of farming is known by on farm diversity. On farm diversity is one way that we put guarantee to our food security. The key to a resilient and sustainable agriculture lies in the diversity of available options that can fit in different agro-ecologies and conditions. This also includes giving space for non-crop off farm diversities to keep the whole ecosystem healthy.

So the need to conserve our landraces or traditional varieties is not only for their historical value. We need them to survive as well as ensure our food security in diversity. Of course we have to improve the productivity of our landraces through application of modern technology without making fundamental changes to their germplasm. So they are still our basis to the improved varieties. We cannot get the improved ones without the traditional varieties. Personally, I am not also against importation of foreign improved varieties as long as they are health and environment friendly. But that should not be at the cost of our traditional varieties. Hence we have to try to strike the balance.

**Ato Regasa’s response on the comments and questions**

Let me start my responses by commenting on the ways our parliamentarians can use to get information on various legislative issues. As to me, the parliament should exploit both formal and informal ways to get information regarding issues to be considered in a bill before its enactment.
Coming to our agenda of agriculture and seed issues, some of you have reflected your concern regarding whether our traditional way of farming and traditional varieties can enable us ensure food security. Your concerns are right in terms of the amount of research and investment we dedicated to improving it. If we see our investment in agricultural research in the past 50 years, there is no significant institutional improvements or changes. So this shows that we have not yet explored our potentials in the agriculture and agro-biodiversity. As a result, we know not much about its contents and the contexts in which it exist.

Evidently, our country is rich in biodiversity at large and agro-biodiversity in particular. Along with the agro-biodiversity we have also time tested traditional ecological knowledge that can be integrated with modern scientific knowledge to get the best out of our agriculture. So we have to invest on improving the capacity of our agricultural research institutes and human resource in order to fully know our capacities and exploit them to ensure food security.

As Ato Mellese has rightly stated we have to have the common understanding that our on farm diversity is one of our potential to ensuring food security. We have to invest on improving our own varieties, rather than labeling them as backward and useless and try to import foreign improved varieties. Our researchers have to also learn working with farmers and giving space for their traditional ecological knowledge in their researches. It is only when we accommodate the needs, life styles and traditional knowledge and practices that our research outputs can be well entertained by our farmers.
Participants of the workshop also forwarded the following questions for more clarification of issues raised in the presentations by Dr. Bayoush Tsegaye, Dr. Gemedo Dalle and Ato Ayele Kebede:

Q In some literatures India is presented as the best example of nations that tackled the problem of food insecurity through green revolution; is there anything that we can learn from the experience of India?

Q These days we hear that Europeans are after the idea of replacing hybrid variety seeds by their landraces or traditional varieties; so why do we promote the use of hybrid or improved varieties that they are doing away with?

Q We hear that our farmers are taking part in multiplying improved seed varieties. But to what extent our experts inform the farmers about the advantages and disadvantages of these improved varieties vis a vis their traditional varieties?

Q One can easily observe or tell that there is no coordination and cooperation among the various experts in the field of agriculture in rural areas. There is, for instance, conflict, rather than cooperation between an agricultural extension expert and the environment expert. This kind of relationship between and among the experts will obviously have a negative impact on the productivity and sustainability of the agriculture. So what is your suggestion to improve such undesirable relationship?
Q We hear that there are different non-governmental enterprises engaged in the production and distribution of improved seeds. Do we have a mechanism of checking and verifying the quality of such seeds being transacted through private persons? How can farmers claim compensation if they incur loss as a result of poor quality seeds?

Q The ever increasing population size, land degradation and other factors require that we must use technological inputs to improve farm productivity to meet the demand for food. Yet, your presentations seem to consider technology as a threat and promote maintaining the old systems. How can that be realistic? Can we really maintain the existing old or traditional system and exist in this dynamic world?

Ato Ayele’s response on the comments and questions

The first green revolution was conducted in the 1960's and 1970's. It is right that India was one of the countries that implemented the green revolution extensively. But, as far as I know, India’s success in ensuring food security is, by and large, attributable to its investment in human resource development and transfer of technology. Besides, the then green revolution was implemented while population was less and resources were relatively abundant. India had an advantage of getting huge foreign aid and loan as well as technical support for the green revolution.
But now, after some four decades, we are in a totally different situation. Population has shown significant growth and resources are scarcer. So I personally do not think India’s experience in the first green revolution can work for us now in the second green revolution.

As regards the comments on science and modern technology, what I said in the presentation is that industrial agriculture considers science as unbiased and so the only solution. But, what we are saying is that, yes science is important and can be a solution to many problems; yet, that is not always true. If we take the invention of DDT fifty years ago, it was taken as a paradigm shift in the history of pesticides. But now it is being cursed for the unforeseen effects it inflicts on the human health and the environment.

The fact that we have to use science and modern technology to solve our social and economic problems is undeniable. But we have to buy only those, which fit to our context. So we have to evaluate the idea of entertaining western big seed industries, like Monsanto, in this light. We say that they are profit oriented and as such want us to be totally dependent on them for seed. In other words, they want to control our agriculture and food system. This is a failure not only for our farmers but also for all of us as a nation.

**Dr. Bayoush’s response on the comments and questions**

Let me connect my reflection to what Ayele has finally said about hybrid seeds and big seed industries. These industries apply...
terminator gene to the hybrid seeds they produce. They do this to make the seeds non-reproducible or usable more than once. And their reason is obvious; it is to get profit. They want the farmers go to them for seed every time they want to plant their farm. That is the strategy. So that is why we have to be cautious of their approach. The other effect of entertaining hybridized seed is their effect of displacing the local varieties. When we lose the local varieties we lose the time tested traditional ecological knowledge along with them. Hence the effects are far reaching.

We cannot just sit and say we do not want the hybrid or improved varieties. We should work on improving our traditional varieties. So far our investment on improvement of local varieties is insignificant. The little investment we made is on limited varieties. So we need to invest more on researches intended to improving our local varieties. And for that we can rely on the ample varieties we have instead of limited ones.

We also need to conserve our local varieties, as they are the ones, which can adapt and survive in the diverse agro ecology and the unreliable climatic condition. Abreast this we have to also give due consideration for the traditional ecological knowledge of our farmers, which, if integrated with the modern scientific knowledge can take us to the level we want to reach.

**Dr. Gemedo’s response on the comments and questions**

I would like to comment on the concern about the quality of improved seeds being transacted by private enterprises and the right of farmers to claim compensation for the loss they incur as a result of poor quality seeds. As to the mechanism of verifying the
quality seeds in transaction, I think there is a government institution responsible for seed issues. It is the Ethiopian Seed Enterprise. So, this institution is responsible for controlling the quality of seed that any organ would present to farmers.

And regarding farmers’ right to claim compensation in case they incur loss as a result of poor quality seed, I think there is a law dealing with this issue and so they can go to a court of law to demand their right. Besides, I think we need to place a system of guaranteeing to protect farmers from such fraudulent acts.

**Concluding Remarks**

At the end of the one-day workshop, participants have forwarded the following comments and suggestions to be considered by the organizers for similar meetings to be held in the future:

- Generally the workshop is very good and informative. We have got valuable information regarding seed issues, ecological agriculture and farmers’ rights. But the workshop would have been even more fruitful had there not been time constraint to accommodate the ideas and reflections of every participant. Many people did not get the chance to say their ideas because of time limitation. So consider the time when organizing such a workshop in the future.

- This workshop is organized only for members of the parliament. It would have been good if people from other fields, like research institutions, have participated to get diverse views on the issues.
You should have prepared and provided us the presentations in hard copies so that we can refer to them whenever we wanted to.

The researchers and scientists who have presented the papers should be open to give information to the parliament on relevant legal issues in the future.

The government appreciates civil societies and NGOs taking such initiative to open discussion on a national issue especially relating to environment and agriculture. So we call up on MELCA to continue organizing such workshops for all concerned organs in the future.
Reflections, Questions and Discussion on the Workshop Organized for Agricultural Researchers

The workshop organized for agricultural researchers was conducted on December 16-17, 2011 at Jupiter Hotel in Addis Ababa. Agricultural researchers from the federal and regional agricultural research institutes have been invited and participated in this workshop. The purpose of the workshop is generally to create a forum on which the researchers in the agricultural field discuss on issues of seed, ecological agriculture and related laws so that they share ideas and experiences. The workshop is further aimed at creating a common understanding, among the researchers, on the current trend opportunities, challenges and the fate of the countries agricultural system in the future.

Following presentation of one or two the papers, the floor is open for reflections, questions and suggestions on issues raised in the papers. As such the deliberations made in relation to the presented issues and suggested way forwards are presented as follows:

Questions and Reflections on Presentations by Ato Regasa and Dr. Bayoush

Ref. In line with the growing population and diminishing land holding size, the current trend in research institutes seems to focus on the breeding of high yielding varieties. This is basically to
meet the increasing demand for food and solve the prevailing food security problem.

We have seen from the presentation that our investment on improving our local varieties is very limited. I think we all agree with the idea. So, I think it is we need to contextualize our researches with the information we got from this workshop hereafter and work on improving our traditional varieties along with the improved ones.

**Q** Linking our agricultural research institutions with institutions like the Institute of Biodiversity Conservation (IBC) is crucial for the conservation as well as improvement of our traditional varieties. There was a relatively good link between these two institutions some years back. But now that link has totally disappeared. So how can we revitalize that link and coordinate our works for the common good?

**Q** Is modern technology a threat to agro-biodiversity? What is the value of modern technology in light of low input-low yield traditional agriculture?

**Ref.** As rightly reflected in the presentation, our country is one of those few endowed with diverse genetic resources. And most of these resources can be used for food. But our food is limited to very few crop types. It is different from the food style of other countries. So, this should be one of the areas we have to work on to solve our food security problem. We have to introduce new food types and diversify our sources of food.
Ref. As far as modern technology is concerned, there is nothing wrong in using it. We have been using it and will continue using it. But the basic idea is that we have to cautious of the context and condition we use them. Everything we buy from the west may not fit our way of life, culture, agro-ecology, etc. Some of them may even be dangerous to our health and environment. So we have to be selective in buying western technology.

Even those technologies we consider worth buying should not be at the cost of our time tested traditional ecological knowledge. Our researchers have to try to create a synergy between the modern technology and knowledge and the traditional ecological knowledge of our farmers. For sure we can get the best out of such integration.

By doing so we can enhance productivity while, at the same time, promoting diversity. The idea that traditional farmers are good only as a source of genes is now obsolete. The westerners, who used to propagate this notion, are now considering traditional ecological knowledge as the basis for agro-biodiversity and healthy ecosystem. Hence, as researchers we have to focus on integrating our science based knowledge with that of the farmers, who have ample experiences in traditional breeding.

Ref. It is not only our food style or culture that is different from others, especially the westerners. Our agro-ecology is also very different. We have diverse agro-ecologies that call for different approaches depending up on the condition. We have very limited topography that can fit for the western type large scale industrial agriculture based on monoculture cropping. So we have to
consider all these when thinking of boosting productivity through the application of large scale industrial farming.

Q In EOSA, what kinds of technical and resource supports do you provide for the Community Seed Banking (CSB)?

Q It is reflected in the presentation that there are different varieties that fit the different agro-ecologies. That is true. But the crop types that farmers want to plant vary from time to time. So, how can we set limited crop types as appropriate for a given agro-ecology?

Q Displacement of farmers' variety may occur as a result of the act of farmers themselves. How can we manage such acts?

Ref. There is a plan on the part of the government to revise the existing seed law. The draft seed law, which makes seed options more limited, has already been prepared and it can be enacted any time. So we have to do something to influence the parliament not to promulgate the law in its existing status.

Ref. Theoretically we all agree that genetic diversity is the basis for healthy life and ecosystem. We also assert that we can enhance farm productivity by promoting diversity. On the other side there is an idea of boosting productivity by through use of limited improved varieties. So we need to substantiate our assertion of enhancing productivity by promoting diversity with practical data. Otherwise government policy and decision makers can not accept our argument.
There are two issues related to this. The issue of sustainability and enhancing productivity. Enhancing productivity through use of modern inputs may help to tackle the immediate problem of food insecurity, but it obviously compromises sustainability of the agricultural system. Enhancing productivity by promoting diversity is a strategic way of making the agriculture resilient and sustainable. So we need to work to strike balance to have a persistent, resilient and sustainable agriculture that meets the demand for food of the people.

Q: There are people who argue that modern breeding has no the side effect of eroding traditional varieties. Does EOSA or MELCA have a plan of doing research to prove or disprove this assertion?

A: Regasa’s Response to the Questions and Reflections

I totally agree with the reflection that there is no coordination and cooperation between researchers or research institutes and the IBC. I think we lack working materials required to create the link and coordination. But that should not have been a reason for the total disconnection. Exchanging information regarding exploration, collection and conservation of germplasms can be done without the need for working materials. So, I can say there is also a lack of disposition. Any ways, there is no question that we need to reinitiate the link for the common good.

As regards the question about modern technology, I would not say much because it has already been said. We need technology to solve our problems in the various sectors. What I want to
emphasize is that we have to critically see what kind of technology we use for what and in which context. And when using modern scientific knowledge in the agriculture we have to integrate it with the traditional ecological knowledge of farmers. In our case we tend to make farmers responsible for both increasing production and conserving the diversity. But I do not think that is right. We should not leave the issue of conservation to farmers. We should also invest on increasing the productivity of the farmers’ varieties. Besides, we have to build the capacity of our farmers to be engaged in the production of improved local variety seeds to meet the increasing demand.

**Dr. Bayoush’s Response to the Questions and Reflections**

Regarding the question what technical and resource support we make for the community seed banks, we build the seed banks and fill with required facilities. We also train farmers on how to handle the seeds in the seed banks and so far we faced no problem of germination with the seeds saved in the banks.

And on farm fields, we work with both farmers and agriculture experts in the communities as to how the various varieties should be improved and handled on farm. Farmers are also being engaged in the production of improved seeds. So we provide them training on how to produce the improved seeds.

There is also effort to introduce new improved seed varieties where they can give best yield depending on the agro-ecology. But the side effect of this, as we have seen, is that, sometimes all
farmers in same area start to produce one variety that is highly needed in the market, year after year. And this is having the effect of displacing the other local varieties and compromising the diversity.

As regards the need to create link with universities, it is right that we should have a way of working with them to share our experiences to students who will be the future experts in the agricultural field. So we are willing to do so and will take the initiative some time in the near future.

Questions and Reflections on Presentations by Ato Mellese and Ato Ayele

Ref. It is stated in Ayele’s presentation that a significant number of the global population is suffering from hunger not because there is scarcity of food but it is because of the unjust way of food/resource distribution in the world. There is excess food in some parts of the world while there is little or no food in some other parts (like Sub Saharan Africa) to which Ethiopia belongs. Ayele condemns such unfair and unjust food distribution. But I say we have to strive to fill our food gap rather than counting on their excess food because that is their food; we cannot claim their food. We may get it as aid not as of right. So the right way is to work hard to be able to produce our own food.

To do that, we have to work both on the improvement and conservation of our farmers’ varieties and use improved seed
varieties and external inputs to get high yield to meet the increasing demand for food. As far as possible, yes, we have to use organic matters to produce food. But that is not enough to meet the demand. So using external inputs is something that we cannot avoid. But still the use of improved varieties and external inputs should not, by any means, be at the cost of our farmers’ varieties. So we have to try to strike balance and find our own way toward food security and sustainable agriculture.

**Ref.** I am afraid if we can accommodate most of these principles to the context we are currently in. But, in any case, we have to give way for considering them to revisit our agricultural system. We should think of how to integrate not only all the elements that contribute to sustainable agriculture but also the various institutions working in the area of agriculture and biodiversity.

**Ref.** For us, as part of African countries, climate change can be seen as both a challenge and an opportunity. On the other hand, as a poor African nation, Ethiopia is not at a level of being considered as contributor to climate change. The country is far from that. Rather it is a victim of climate change to which did not contribute.

If we see the development path that the developed nations have passed through it is an approach that has never considered the safety of the environment and the climate. They are now talking about the effects of climate change widely. As the effect of climate change is transboundary, we are now victims of their environment unfriendly development path. So we have to learn from that and reengineer our development plan.
Q Does proclamation No. 481/2006 protect the rights of Ethiopian breeders? Is it fair to treat commercial and non-commercial breeders by the same law?

Q Why nothing has been mentioned about farmers’ varieties in the seed proclamation? Regarding GMO seeds the law talks about GMOs; what does it mean the law bans importation of only living modified organisms (LMOs)?

Q How can we totally avoid importing GMO products? Do we have the mechanism of checking GMO products?

Ato Ayele’s Response to the Questions and Reflections

I think I have to make my point clear regarding Ethiopia’s contribution to the climate change. I have not raised this point to discuss Ethiopia’s emission contributing to climate change as compared to other countries. It is a clear fact that there is no emission that Ethiopia has contributed to the global climate change. I raised the issue just to show that agriculture is the most contributor of green house gas emission as compared to other economic sectors in the country. Otherwise, I totally share the idea that Ethiopia is rather a victim of the global climate change.

I also agree with the idea that we have to reengineer our development plan. We have to see ways that would enable us boost our agricultural productivity in a sustainable manner. And the key to sustainable agriculture is maintaining genetic diversity both on farm and off farm. We may also use external inputs to
increase our agricultural productivity. Yet, we have to be cautious of maintaining the balance by using inorganic external inputs as a gap filling mechanism.

**Ato Mellese’s Response to the Questions and Reflections**

Regarding the law about importation of GMOs, we have two versions: the Amharic and English. On this issue the Amharic version talks about LMOs while the English says GMOs to refer to the same thing. So we see that the two versions can be interpreted differently. In such a case, according to the law of the country, the Amharic version has an overriding effect. Accordingly, the law forbids importation of LMOs. So the law does not ban importation of processed foods.

Generally, we have a biosafety law that regulates the transaction of genetically modified organisms. According to this law, the country may import genetically modified materials depending on the condition and use of the material. Hence, importation of GMOs has not been totally avoided.
Challenges and Way Forward

MELCA, in collaboration with EOSA and ISD has organized a similar national workshop on seed issues and sustainable agriculture in August 2010. It was a national workshop on which researchers, academicians, environmentalists, journalists and farmers have participated. The idea of organizing the same workshop for media people, parliamentarians and researchers was raised on that workshop. MELCA has taken the initiative of organizing the workshop on Seed issues, Ecological Agriculture and Farmers’ Rights based on that suggestion.

After briefing the purposes of the workshop and how it was initiated, Kirubel Teshome, from MELCA-Ethiopia introduced that there are challenges and way forwards stated by the participants of the workshop held in August 2010. So he suggested that it would be better to use those challenges and way forwards stated then as a basis and enrich them instead of dwelling up on drawing up new challenges and way forwards.

Participants of the workshop agreed to the suggestion by Kirubel, and accordingly he presented summary of the challenges and way forwards as follows:
Challenges

1. Very low concern and awareness on the value, significance and use of Farmers Variety

   - Alarming lack of acceptance and knowledge about the value and significance of Farmers’ variety seeds

   - The common misconception and attitude of both the researchers and decision makers which equates farmer’s varieties with low production and yield.

   - Low level of awareness among decision makers, research institutes and farmers about the national and international laws regarding seed, farmer’s varieties and indigenous knowledge.

   - Serious gap in intergenerational transfer of knowledge from elders to younger generation

   - The growing dominance of western paradigm of thinking in our education system which results in diminishing the relevance and value of traditional knowledge

2. Lack of market access and recognition of farmer’s variety seed due to inadequate scientific documentation, labeling and publicity work

   - Lack of value addition, certification, processing, packing and labeling for farmer’s variety seeds
3. Lack of functional and effective linkage among relevant stakeholders on farmers' variety seeds

- Lack of integration and prior consultation between farmers and research institutes in setting the research agenda.
- Regional research institutes do not periodically update and document their collection and research results in collaboration with the national gene bank.

4. Very poor enhancement efforts

- There is hardly adequate collection, characterization made in terms of both quantity and quality;
- Traditional breeding practice of farmers is not yet properly recognized and studied;
- No strict investment, long term research and well organized enhancement program on farmers varieties or the local germplasm.
5. The advent of growing corporate push for modern seed, industrial agriculture and techno fix for agriculture

- Corporate dominance and the need to control of global seed system (like Monsanto, Syngenta, etc)
- The increasing push for Green Revolution for Africa which is synonymous to Industrial Agriculture

6. The lack of skilled manpower, leadership and institutional capacity on farmers’ varieties

- High turnover of skilled manpower on trained on farmers’ varieties;
- The absence of specific institution to train the future generation (young development workers) on farmers varieties;
- The huge erosion of traditional ecological knowledge and the huge intergenerational gap between elders and the younger generation;

7. The lack of awareness on the enormous role of women farmers on keeping farmers varieties

- Their voice is not usually heard
- The roles women play in the development and conservation of farmer varieties of seeds, although valuable, were not
given adequate recognition for it is not usually valued in monetary terms.

**Way forward**

**There is a crucial need to engage with awareness raising programs for**

- Farmers
- Extension workers
- Research dissemination and farmers communication council
- Research institutes and researchers
- Decision makers
- Media
- There is urgent need for joint planning and collaboration of IBC with research institutes
- IBC shall continue to do the collection and characterization task to facilitate utilization of collected materials by research institutes
- Research institutes should give emphasis for farmers’ varieties
o The work for effective institutional linkage and coordination should be channeled through the existing Council of Agricultural and Rural Development Stakeholders Linkage setup at zonal and wereda level

o Efforts to enhance and popularize farmers’ varieties by value adding, labeling and certification

o To organize bazaars and exhibitions to display the diversity of farmers varieties to facilitate seed exchanges and promote wider use

o To institutionalize the training for farmers so that they would own the process of participatory varietal selection and crop improvement activities

o To include the voice of women in defining research areas/topics

o To call for urgent consideration of establishing a committee within the Council of Agricultural and Rural Development Stakeholders Linkage that specifically deals with farmers varieties.

Then participants got split up in to groups to discuss up on and enrich or amend the foregoing challenges and way forwards. After discussing in groups, they came up with the following additional challenges and way forwards:
Participants started presenting what they discussed in groups by commenting on the presented challenges and way forward. Accordingly, they commented that while the challenges and way forward drawn in the previous workshop are all sound and acceptable, most of the challenges are described as lack of one or another thing. It is difficult to generalize that there is lack of all the things mentioned as lacking in the challenges, like Lack of functional and effective linkage among relevant stakeholders, lack of skilled manpower, lack of awareness. Sometimes the problem could be not lack but inadequacy. Hence some of the terms should be corrected accordingly.

The other comment is forwarded on taking the introduction of big seed companies as a threat. Instead of considering them a threat, they said that it should be seen as an opportunity that pushes us to show the competence of farmers’ varieties provided that we improve them through research. Besides, seed companies could be useful for us in terms of resource availing and technology transfer. Furthermore, it would be good to refrain from labeling improved varieties as threats. Rather we should develop the mind set that all varieties, including the improved ones, have their own traits to fit to specific situations. So we need all varieties to deal with different conditions (like moisture stress) and utilize them complementarily.
Additional Challenges

1. Lack of Capacity
   - Lack of capacity for quality standardization and labeling of farmers’ variety seeds.
   - Absence of incentive mechanism for farmers who conserve landraces with unique and high quality trait.
   - Lack of skilled man power to generate and document data that disprove the perception that farmers’ varieties are low yield.
   - Lack of capacity at community level for implementation of laws dealing with issues of seed and other genetic resources.
   - Inadequate knowledge of the traits and germplasms in farmers’ seed varieties.
   - Inadequate investment on enhancement of the productivity of farmers’ varieties.

2. Problems of perception
   - Giving low value for the original germplasm from which the improved seed has been generated.
o The perception that only improved varieties can solve our problem of food security because farmers’ varieties can not give high yield.

o The perception that, farmers’ varieties cannot cope up with the climate change.

3. Institutional Problems

o Weak or unsustainable institutional linkage between research institutes, IBC and EPA on seed issues and conservation of other genetic resources.

o Absence of an organ responsible for in-situ and ex-situ conservation of biodiversity and coordination of stakeholders within research institutes.

o Non-decentralization of the IBC low regard for collecting and documenting genes.

o Lack of functional linkage between farmers and seed market.

4. The global development pattern and alarmingly increasing demand for food that focuses on high input-high out put agricultural system.
Additional Way forwards

- Organizing an awareness raising campaign for concerned organs on the conservation and utilization of farmers’ variety seeds.

- Set a system of rewarding farmers who conserve varieties with unique traits.

- Set a system for the collection, description, recognition and certification of farmers’ varieties.

- Conduct a baseline survey on the genetic and social values and dynamics of farmers’ varieties.

- Push for the inclusion of education about the history of seeds and farmers’ varieties in school curriculums.

- Decentralization of ex-situ conservation and scaling up of in situ conservation of local varieties.

- Invest on enhancement of the productivity of local variety seeds.

- Awareness creation regarding laws dealing with seed and other genetic resources at community level.

- Giving equal consideration, on the part of breeders, for treat and variety development.
○ Giving due consideration for integration of traditional ecological knowledge with modern scientific knowledge and enhancing farmers’ breeding capacity as well as quality traits in breeding strategy.

○ Provide pertinent information to the legislative organ to shape future laws dealing with issues of seed and other genetic resources to meet our social and needs.
Conclusion

Humans have been farming for some 600 generations, and for most of that time the production and consumption of food has been intimately connected to cultural and social systems. Yet, over the last two or three generations, the tendency to shift the agricultural systems to industrial agriculture, with the intention of producing more yield per area, to meet the growing demand for food in line with the growing population is pushing. But as Jules Pretty, a professor of environment and society at the University of Essex, UK, has rightly put it, “industrial agriculture produce more food per area and per worker than ever before, but only look efficient if the harmful side-effects: the use of fossil fuels, the loss of soil health, the damage to biodiversity, the pollution of water and air, the harm to human health caused by agricultural pesticides on food and in the environment, and the development of antibiotic-resistant bacteria in large-scale animal production facilities are ignored.”

Concerned of the environmental and human health problems associated with industrial agriculture, researchers and scientists in the field of environment and agriculture are advocating, based on research evidences, the value of ecological or organic agriculture. A key question that is often asked about ecological agriculture, is whether it can be productive enough to meet the world’s food needs. While many agree that ecological agriculture is desirable from an environmental and social point of view, there remain fears that ecological and organic agriculture produce low yields.
However, several research outputs are showing that ecological agriculture is productive and has the potential to meet food security needs, especially in the context of countries like Ethiopia, where, poor, smallholder farmers dominate the agricultural system. In such a system, even if the technology is available, the poor farmers cannot afford them, provided that it is supported by appropriate research.

Hence, there should be other solutions based on locally available and/or cheap technologies combined with making the best of natural, social, and human resources. Yet, ecological agriculture does not mean total avoidance of modern technologies. If a technology works to improve productivity for farmers, and does not cause undue harm to the environment, then it is likely to have some sustainability benefits.

The purpose of the consecutive workshops organized for organs considered influential stakeholders in the countries agricultural system is to enlighten these organs with these views and trigger them kindle a kind of debating, sharing and exchanging of ideas with in their respective professional areas as well as in the society at large. We believe this will have the effect of probing policy makers to consider the matter and make necessary amendments to the country’s agricultural policy direction.