Global Veterinaria 16 (4): 399-412, 2016
ISSN 1992-6197

DOI: 10.5829/idosi.gv.2016.16.04.10368

Organic Livestock Farming and the Scenario in the Developing Countries: Opportunities and Challenges

[1]Daniel Taddesse Wolde and [2]Berhan Tamir

[1]Depatrtment of Dairy and Meat Technology,
Haramaya University College of Agro-industry and Land Resource, Chiro, Ethiopia
[2]College of Veterinary Medicine and Agriculture,
Addis Ababa University, Bishoftu campus, Bishoftu, Ethiopia

Abstract: Alongside the advancement of scientific researches to enhance productivity of agriculture with the scarce resources the world has today, agricultural scientists had begun long ago to reveal the limitations of intensive agricultural practices and sought deeply the solutions which can potentially keep and satisfy the growing world population need in terms of food that is derived from farm animals. In this regard, they are trying to answer the question of quality-conscious consumers who are increasingly seeking environmentally safe, chemical-residue free and healthy foods, along with product traceability and a high standard of animal welfare. Thus, this study intends to explore and discuss about organic livestock farming and the condition in the developing countries including the opportunities and challenges. Efforts have been made to assess and collect relevant information to reach to the different aspects of organic livestock farming and its condition in the developing countries. This review familiarize and explores the basic knowledge of what organic livestock farming mean, compare rationally between conventional and organic livestock farming and incline to practice it, initiate more and more producers to start organic livestock farming and enjoy premium prices for their produce. Moreover, the document will be an input for policy makers of developing countries to draw policies and commit to its accomplishment.

Key words: Organic agriculture · Conventional farming · Developing countries Opportunities · Challenges · Livestock standard

INTRODUCTION

Until the early part of the 20th century pretty much all the food grown across the world was organic. It wasn't called organic food – it was just food. Nobody had thought of putting chemicals into soil and sprays to enhance crop growth and yield. Genetic engineering took place over generations as farmers selectively bred to improve their stock or their seeds [1]. With the rise of the petro-chemical industries in the early 1900s, agricultural research became focused very much on the chemicals that are needed for plant and animal growth until the problems became too big to ignore [1]. In fact agrochemicals, veterinary drugs, antibiotics and improved feeds can increase the food supply while minimizing production costs in various livestock production systems around the world. However, these days, quality-conscious consumers are increasingly seeking environmentally safe, chemical-residue free healthy foods, along with product traceability and a high standard of animal welfare, which organic production methods are said to ensure [2].

Global sales of certified organic food and drink reached US$54.9 billion in 2009 [3]. It is considered new and interesting option for sustainable agriculture in developing countries because it offers a unique combination of low external inputs and technology, environmental conservation and input/output efficiency [4].

[5] viewed organic farming as holistic production management systems (for crops and livestock) emphasizing the use of management practices in preference to the use of off-farm inputs. This is

Corresponding Author: Daniel Taddesse, Departement of Dairy and meat technology,
Haramaya University College of Agro-industry and Land Resource, Chiro, Ethiopia.

accomplished by using, cultural, biological and mechanical methods in preference to synthetic materials. Organic farming takes the best of the traditional and combines them with modern scientific knowledge [6].

Organic farming is about the regulations governing it that contain detailed guidelines as to how specific livestock should be bred and fed. Thus, organic livestock farming is based on the principle of a close link between animals and the soil. The need for a link with the soil requires animals to have free access to outside areas for exercise and also implies that their feed should not only organic, but needs to be made on the farm. This sector of organic farming is, more or less, strictly regulated by provisions on animal welfare and veterinary care [8].

Farmers in resource-constrained countries traditionally use few external inputs, such as allopathic medicines and antibiotics and follow grazing-based extensive or semi-intensive production systems. In many ways, they are thus closer to organic farming systems, though largely by default. However, a lack of appropriate agro-ecological knowledge means that they fail to gain most of the environmental, social and economic benefits of organic management, which translate into ecological intensification (i.e. sustainable farming). Nevertheless, developing countries are becoming important suppliers of organic foods [2].

In general, in the Global South, organic production exists in two parallel forms, one which is mainly focused on certified organic farming for exports to Europe and USA and the other is (non-certified) mainly focused at improving food self-sufficiency using agro-ecological methods and often supported by NGO's [9]. In the Global North organic farming is mainly certified and driven by a combination of consumer demand and political support to the sector through agricultural payment schemes [3].Therefore, organic production is not only a challenge for producers in developing countries, it offers new export opportunities as well [2].

Organic production practices are just one of the many options available to livestock producers to grow and market quality livestock and wholesome end-products. Organic livestock management practices offer unique rewards and challenges to the livestock producer regardless of the animal species produced. Organic livestock production often necessitates the integration of animal-pasture-crop production to be successfully. There are a number of considerations that need to be addressed to successful produce certified organic livestock and products [10]. Therefore, the aim of this study is to explore and discuss about organic livestock farming and the current scenario in the developing countries including the opportunities and challenges.

Defining Organic Agriculture and Organic Livestock Farming: According to the National Organic Standards Board (NOSB) of the United States Department of Agriculture (USDA), organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain, or enhance ecological harmony. The primary goal of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants, animals and people [11].

Organic animal husbandry, on the other hand, is defined as a system of livestock production that promotes the use of organic and biodegradable inputs from the ecosystem in terms of animal nutrition, animal health, animal housing and breeding. It deliberately avoids the use of synthetic inputs such as drugs, feed additives and genetically engineered breeding inputs [2]. Organic livestock farming is based on the principle of a close link between the animals and the soil. The need for a link with the soil requires animals to have free access to outside areas for exercise and also implies that their feed should be not only organic, but preferably produced on the farm. This sector of organic farming is, moreover, very strictly regulated by provisions on animal welfare and veterinary care [12].

Historical Development of Organic Livestock Farming: Historically, livestock have always played a key role in organic production systems. During the formative years of the organic movement (the 1920s through the 1950s), the typical organic farms of Great Britain, Continental Europe and North America integrated livestock production with the growing of both food and feed crops. Livestock provided manure, which is one of nature's best fertilizers and a good means for recycling nutrients within a crop rotation. Growing livestock feed alongside food crops diversified rotations; since forage legumes and sod-forming grasses are among the best feeds for ruminant livestock, these soil-building crops naturally became part of long sustainable cropping sequences. In such systems, livestock could also be fed cull vegetables, weather damaged crops, crop residues, "alternative" grains and forages and cash crop grains during years of low prices [13].

Organic agriculture has its roots in traditional agricultural practices in small communities around the world. Farmers passed down knowledge of effective practices onto subsequent generations. Organic agriculture became visible on a wider scale in the 1960s, when farmers and consumers became concerned that the amount of chemicals used in crop and animal production could have negative consequences for human health and the environment. Since then, it has developed into a more cohesive and organized movement and it is now the fastest growing food sector globally [14].

By the end of the 1960s, however and especially in the 1970s, organic farming came to the forefront in response to the emerging awareness of environmental conservation issues. New associations grew up, involving producers, consumers and others interested in ecology and a lifestyle more in tune with nature. It was in the 1980s, however, that organic farming really took off, when the new production method continued to develop, along with consumer interest in its products, not only in most European countries, but also in the United States, Canada, Australia and Japan [12].

In November 1998, the IFOAM adopted basic standards for organic farming and processing. The Federation, which was set up in 1972, brings together organizations from all over the world which are involved in organic production, the certification of products, research, education and the promotion of organic farming. In June 1999, the Codex Alimentarius Commission adopted Guidelines for the Production, Processing, Labeling and Marketing of Organically Produced Foods. These guidelines set out the principles of organic production from the farming stage through the preparation, storage, transport, labeling and marketing of crop products. They are intended to enable member countries to draw up their own rules, on the basis of the principles, while taking account of specific national features. Guidelines are shortly to be adopted for the organic production of animal products. In 1999, the FAO also embarked on an organic farming work program, mainly concerned with promoting organic farming in the developing countries [12].

Comparison between Conventional versus Organic Livestock Farming: In conventional agriculture the negative environmental impact of many intensive production systems has increased the importance of more sustainable and environmentally friendly systems. In addition to environmental benefits, standards for organic livestock production provide several pre-conditions that are required to achieve good living conditions for farm animals [15] and today more farmers are converting to organic farming.

Organic farms use fewer inputs than conventional farms. In the milk sector, organic farms have lower stocking densities. They grow less fodder maize than their conventional counterparts, but the proportion of pasture in their utilized agricultural area is higher. They also buy less concentrated feed and coarse fodder per dairy cow. In an exploratory study raw(bulk) cow's milk from five organic and five (bulk) cow's milk from five organic and five neighboring conventional farms were compared at the end of the winter housing period. The levels of CLA (conjugated linoleic fatty acids) were significantly higher in the organic than conventional milk. No clear difference in taste was observed. The organic milk was generally considered creamier and tended to taste more of hay and grass than conventional milk [16].

Organic holdings have more extensive production methods than their conventional counterparts, but these involve a more intensive use of labor. The labor needed to manage an organic farm is ten to twenty percent higher than on comparable conventional farms.As expected, the lower input intensity of organic production systems results in lower yields (output per hectare or per cow).

Studies in developing countries showed that organic fields were generally higher under normal or favorable conditions [17] and significantly higher under less favorable conditions [18]. Overall, the majority of economic studies in developing countries showed higher yields from organic production, whereas not one study on developed countries showed higher yields from organic compared with conventional [19].

Total costs for operating most organic farming systems are lower than those for comparable conventional farms and there are differences in the relative importance of individual cost elements. The restrictions on the use of fertilizers, pesticides and feed concentrates on organic farms result in reductions in these costs of production [20]. However, market income per unit of labor is often lower. The net market margins per unit of production are often higher for organic farms. This does not necessarily translate into higher net market income per unit of labor, because organic farms need more units of labor to tend the same number of hectares or cows [20].

The other aspect is organic farmers receive, on average, much higher agri-environment and animal welfare subsidies. These are granted to farmers who voluntarily commit themselves to exceeding the minimum relevant standards and are intended to promote agricultural

production methods that help to protect and enhance the environment, the landscape, natural resources, the soil and genetic diversity. As we have seen, such practices come at a cost in that they may require more work and/or limit production. The payments cover income foregone as well as such additional costs.

Organic livestock production requires the use of a number of breeds, with selection of breed and crossbreeding being the main strategies for improving product quality. The selection of animals via sire referencing is used by organic livestock producers. While conventional livestock production looks mainly at a limited number of traits such as conformation and fat and milk yield, organic livestock production is shown to consider a broader range of attributes, including forage conversion, ease of calving and general disease resistance. Traditional breeds are able to contribute to the extensification, diversification and environmental conservation objectives now required by both organic producers and rural development policy [21]. Advocates for conventional farming argue that organic farming decreases yields. Organic advocates, on the other hand, believe that yields are equal to those of conventional farms over the long term and that it is a more sustainable system because the health of the environment must be factored into any agriculture measurements [14].

In general, when organic livestock farms are contrasted with comparable conventional farms they were found to use less fossil fuel energy, lose less soil to erosion, generate fewer groundwater pollutants and have less impact on global warming-all characteristics of a more sustainable approach to agriculture [13].

From studies in developing countries conclusions can be drawn that higher yields combined with high premiums seemed to be the underlying reasons for higher relative profitability. Establishing organic markets for staple crops (e.g. organic soybeans, wheat, chillies) that are part of a rotation offers considerable potential to further improve the profitability of organic farms in developing countries. If these crops could be sold at a premium price, the revenues of organic farms would further increase [19].

Organic Livestock Farming in Developing World and the Case in Ethiopia: Almost all countries which are investing in their organic agricultural sector are taking note of the changing import environment in industrialized countries and making the required changes to their production standards to enable them to export to the major consumer countries in the North. Developing countries in Asia, such as China, India, Thailand, Malaysia, Sri Lanka; in Africa, such as Kenya, Tanzania and Ethiopia; and among the South American countries, such as Argentina and Brazil, have already developed regulations, standards and certification procedures for organic livestock production. The number of such countries is increasing, mainly due to improved prospects for their exports, as well as a slowly growing domestic market for environmentally friendly food products [22].

In African countries, where an established and widespread domestic market for organic produce is not present, the majority of certified organic production is for export. Whereas, third-party certification is essential for export of organic produce to Europe and the United States [23].At present, Tunisia is the only African country with its own organic (EU compatible) standards, certification and inspection systems. Egypt and South Africa have both made significant progress in this direction, both have two certifying organizations and are well on the way to developing standards [24].

Studies have shown that even in the absence of price premiums, farmers are willing to change to OA because of lower production costs. The organic sector is expected to continue to be the fastest growing sector in agriculture [25]. Much of the increase in organic production is occurring in developing countries where farmers are being attracted by export benefits and substantial price premiums [26].

The organic sector development in Ethiopia where most farmers in Ethiopia has a long history and still continue to practice low external input agriculture, otherwise known as traditional or subsistence farming, with a strong bias towards organic principles for at least 5000 years [27]. Ethiopia has an abundance of hydro, geothermal, solar and wind power. It can thus industrialize by harnessing its wealth of renewable energy resources without polluting the atmosphere. Strengthening its existing organic agriculture with needed scientific inputs will, therefore, given Ethiopia a globally competitive edge in agriculture. Developing a formal system of certification of organic agricultural products will then also give it a globally competitive edge in trade in this era of climate change [28]. The Ethiopian livestock (cattle, sheep and goat) are the preferred breeds in the Middle East market, as they are organically produced and the meat is of good tastes [29].

From a commercial point of view, organic agriculture was started in 1996 by a private company called ‘Mandura' Ethiopia in the north-western part of the country, where it focused on producing organic sesame.

Then after, the role of the private sectors in the organic sector development has shown dramatic progress to where there are 23 private companies and 5 farmers' cooperatives currently involved in organic production and export mainly in Coffee, Sesame, table honey and Bee wax production [27].

Generally, the lack of recognized systems for collection of data on organic agriculture worldwide and the prevalence of uncertified organic farms presents an inherent weakness in terms of getting reliable information [30]. This situation is also true in Ethiopia. In Ethiopia there are certified and non-certified organic farms producing for export and local markets where the later are only for the local market.

Opportunities of Organic Livestock Farming in Developing Countries

Acceptance by Consumers: Most consumers prefer organic foods because they say it is tastier, as well as healthier both for themselves and the environment [8]. Consumers are willing to pay more for organic products [31]. Another reason for Organic products prominence is the opposition to genetically modified food [8]. Under organic livestock production systems, consumers expect organic milk, meat, poultry, eggs, leather products, etc. to come from farms that have been inspected to verify that they meet rigorous standards, which mandate the use of organic feed, prohibit the use of prophylactic (protecting against infection or disease) antibiotics (though in fact all antibiotics are discouraged except in medical emergencies) and give animals access to the outdoors, fresh air and sunlight [33].

Consumer demand for certified organic products is mainly concentrated in North America and Europe with the two regions contributing 96 percent of global revenues of certified organic products [3]. Besides a large variety of organic crop products, main livestock products sold are eggs and dairy products [34]. Even though there is less availability and lack of certification process of organic livestock products in developing countries, most of the people especially those living around urban areas in are aware of the beneficiary aspects of organic products and thrive to use these products for consumption. Once if the government of these countries endorse organic livestock farming as a policy and if awareness created and technical assistance is provided among the communities of both urban and rural areas, people tend to produce more of the organic livestock products so this will increase the supply and compensate the price of products.

Impact on Environment: Organic farming is environmentally friendly. This is because it is well known that chemicals have destroyed many beneficial insect species and have caused environmental degradation[8].[35]reported that Korean researchers found avoiding pesticides in paddy fields encourages the muddy loach fish, which effectively control mosquitoes that spread malaria and Japanese encephalitis (inflammation of brain). In this regard, it is useful for biological pest control.

Organic livestock producers are mandated to manage manure so that it does not contribute to the contamination of crops, soil or water and optimizes the recycling of nutrients [2].

Encourages Biodiversity: Organic farming also provides energy for microbial activity and this has been suggested as an indicator of change for soil properties [36] because the size and activity of the microbial quotient is directly related to the amount and quality of carbon available [37]. Organic farms, often explores biodiversity than conventional farms because it is usually with more trees, a wider diversity of crops and many different natural predators, which control pests and help prevent disease [38].

Livestock farmers may tend to think of insects as pests: mosquitoes and various flies come to mind. Yet dung beetles and other similar insects help to take manure into the soil, where it feeds the microorganisms and eventually the pasture plants. Pollinators that help the ecosystem function are beneficial to livestock and insects are vital to the food chain. You can encourage insects by having a diversity of flowering plants and by not using broad-spectrum insecticides [39].

In addition to a diversity of forages, it can be beneficial to have diversity in grazing animals. For example, adding sheep or goats to a cattle operation will help keep pasture composition stable because all the plants present will be grazed. Otherwise, a plant that cattle will not graze will eventually take over the pasture, causing a loss in biodiversity and in productivity. Along with evening out grazing, adding cattle to a sheep or goat operation helps with predator management and internal-parasite control. The presence of larger animals helps deter coyotes and cattle are a dead-end host for sheep or goat parasites. Also, cattle will graze the more mature forages that sheep tend to ignore. Poultry deserve a mention here, too. Grazing poultry along with larger livestock helps because the birds break up manure clumps and consume fly larvae [39].

Soil Improvement: Increasing soil organic matter by organic farming has the added benefit of improving soil quality and thereby enhancing the long-term sustainability of agriculture [40]. Organic agriculture also help to conserve and improve precious resource-the topsoil, compaction, nutrient loss and erosion, organic farmers use trees, shrubs, leguminous plants to stabilize and feed soil, dung and compost to provide nutrients and terracing which prevent erosion and conserve ground water [38].

Organic agriculture is built around the notion that providing nutritious food and feed improves and sustains the health of people and livestock. The strategies that organic agriculture employs to grow nutritious food emulate nature, beginning with feeding the organisms of the soil. Soil microorganisms and macro-organisms function as a digestive system that processes organic matter, delivering a smorgasbord (variety) of minerals, vitamins and other nutrients to the crop at a metered pace. The food that soil organisms need to do their job comes in the form of organic matter. Composting, manuring, green manuring and other similar techniques are consequently the standard practices of organic crop production. Rotational grazing management provides comparable humus development through the sloughing off of roots when plants are grazed or mowed; the trampling of plant matter into the soil by the animals' hooves; and the natural deposition of urine and manures. Nitrogen is the limiting nutrient on most organic farms and legumes provide the most economical source of nitrogen [39].

Marketing: Organic farming provides long-term benefits to people and the environment. It aims to increase long-term soil fertility, control pests and diseases without harming the environment, ensure that water stays clean and safe, use resources which the farmer already has, so the farmer needs less money to buy farm inputs, produce nutritious food, feed for animals and high quality crops to sell at a good price [6].

According to the latest survey done by Helga [41] on organic agriculture, worldwide, organic agriculture covers a land area of 37 million ha in 160 countries with a total of 1.6 million producers worldwide. Thirty four percent of the world's organic producers are in Africa followed by Asia (29%) and Europe (18%). The countries with the most producers are India (400,551), Uganda (186,625) and Mexico (128,862). The countries with the most organic land are Uganda (0.23 million ha), Tunisia (0.18 million ha) and Ethiopia (0.14 million ha). The majority of certified organic products in Africa are destined for export to European Union, America and China where the market exist for organic produce. In Uganda, the export value for organic products was 42 million Dollars in 2010/2011 and in Ethiopia it was 33.9 million Dollars in 2010.

Employing organic farming methods will lead to higher profits for farmers not only because of price premiums, but also because of lower production costs [42]. OA technologies can decrease the costs of production as chemical inputs are substituted by locally available and cheaper organic inputs and more intensive labor which the poor often have in abundance. Adoption of OA systems also lowers the need for credit, which is often expensive and difficult to obtain for small farmers [43].

Market income is not the only factor determining a farmer's agricultural income. Subsidies also play an important role [32]. Therefore, governments in developing countries should subsidize and encourage those farmers who are participating in organic livestock farming.

Social Benefits: Organic agriculture may have a significant social impact on rural communities. To begin with, organic farming may lead to improved employment opportunities in local communities. Organic farming often requires more manual labor to compensate for the loss of synthetic fertilizers and pesticides and thus generates more jobs in rural communities. Organic farmers also diversify their crops and spread their planting schedules throughout the year in order to maintain biodiversity and enhance the health of the soil. This creates opportunities for year-round employment, reduces turnover and may alleviate problems related to migrant labor. Greater job opportunities on organic farms contribute to strengthening rural communities as well, by halting exodus to urban areas for jobs [14]. The main benefit according by some organic farmers in developing countries (e.g., China and India) is that they now have better standards of living. Good product prices, low unemployment, dropped rural emigration and reduced health risks (from chemicals) are the results of farming organic [44].

Challenges of Organic Livestock Farming in Developing Countries: Developing countries are already producing a wide range of organic products and many are thriving well. However, most of them are often faced by a number of constraints, such as:

- Lack of technical know-how, for example organic farming practices and production methods [43]. In most developing countries, the technical support is oriented towards using technologies that can enhance productivity per unit input and time. The technical knowhow about organic livestock farming is restricted to private companies that have the access to export and limited local markets.
- Lack of market information, for example which products to grow, which markets and distribution channels to choose, competition, market access [45].Although most of the population in the developing countries become aware of the health and environmental hazard of inorganic agricultural products, there are no extensive promotion works concerning the negative impacts of these products and initiation on the use of organic ones. In addition, most governments in developing countries are promoting the usual conventional production systemswhich could hamper the market information about the availability of organic agricultural products.
- Organically produced foods must meet strict regulations (certification). Entering this lucrative market is not easy. Farmers are denied access to developed country organic markets for two to three years after beginning organic management since such countries will not certify land and livestock as organic before that time, arguing that it is necessary for the purging of chemical residues [46].
- Intensive management and this is why the farming is mostly done on a smaller scale.
- Organic farming is still faced with the problem of higher labor input in its operation. Other studies shows that the main reason why organic farming require more labor is to carry out manual and mechanical tasks essential to growing. The preparation for sale on the farm or on the market also involves more labor on organic holdings [45]. Infact this could be a challenge to organic livestock farming because of the growing flow of the labor force from rural agriculture to urban areas where they could enjoy better payment.
- Organic farming is still hampered by lack of clarity: Consumers were not always sure about what was really covered by organic farming and the restrictions it implied. The reasons for the confusion lay, among other things, in the existence of a number of different "schools" or philosophies, the lack of harmonized terminology, the nonstandard presentation of products and the tendency to blur the distinctions between concepts such as organic, natural, wholesome and so on. The situation was worsened by cases of fraudulent use of labeling referring to organic methods [8]. In the future, organic livestock products will gain access to lucrative local markets because of the growing income, urbanization and the increasing demand of animal products and these together with the information on the inclination to the demand of organic livestock products, will create opportunity to the deceitful use of labelling.
- Organic research tends to be more diffuse, farm-base participatory, drawing on local knowledge and tradition. It also focuses on public goods, resources and tools that are not readily patentable. This explains why organic farming attracts little investment from private sources compare to conventional and biotechnological approaches [38].

There are a number of challenges related to organic farming when it comes to practice. In areas where the agro ecology is not well developed like in areas where industrialization and monoculture is dominant, there comes challenges of shortage of land and manure and this forces farm owners to employ zero grazing and confined system husbandry practices. The other challenge is the conditions for farming and the way in which global food distribution systems are organized, e.g., how live animals are transported, how feed is traded and transported all over the globe and the development of infrastructure and large herds [47].

In a survey conducted in Kenya, given a selection of pre-formulated challenges, the respondent farmers in both selected counties reported that the most important barrier to conversion to organic dairy production at the moment was lack of organic inputs to control external and internal parasites especially ticks and helminthes and secondly, lack of input to use for treatment of diseases like mastitis and East Coast Fever. Smallholder dairy farmers expressed that they were not sure of the efficiency of some of the cultural or biological methods used to control pest and diseases [48]. The second most abundant choice from the list of challenges to organic milk production was lack of organic feeds for livestock. One in three farmers also indicated that there was no market for organic livestock product in both counties. Most of the milk produced by the farmers was sold locally and the possibility of earning higher prices from organic milk production was low [489].

In the Ugandan livestock sector, the challenges of implementing sustainable organic practices that threaten its future development include vectors and vector-borne diseases, organic feed insufficiency, limited education, research and support to organic livestock production [7].

Organic Farming and the Millennium Development Goal: A series of case studies conducted by the Asian Development Bank Institute (ADBI) in Tokyo showed that Organic Agriculture (OA) contributes to both income and non-income aspects of the Millennium Development Goals (MDGs) in all the study areas in selected Asian countries. OA's outcomes on MDGs include contributions to the alleviation of poverty by way of higher incomes, improved farmers' health owing to less chemical exposure, integration of sustainable principles into rural development policies, improvement of access to safe water and sanitation and expansion of global partnership for development [49].

Organic Livestock Production and Handling Standards Livestockstandards: EPA [50] had set standards for organic production and handling: These standards apply to animals used for meat, milk, eggs and other animal products represented as organically produced. The livestock standards say that:

Animals for slaughter must be raised under organic management from the last third of gestation, or no later than the second day of life for poultry. Producers are required to feed livestock agricultural feed products that are 100 percent organic, but may also provide allowed vitamin and mineral supplements. Producers may convert an entire, distinct dairy herd to organic production by providing 80 percent organically produced feed for 9 months, followed by 3 months of 100 percent organically produced feed.

Organically raised animals may not be given hormones to promote growth, or antibiotics for any reason. Preventive management practices, including the use of vaccines, will be used to keep animals healthy. Producers are prohibited from withholding treatment from a sick or injured animal; however, animals treated with a prohibited medication may not be sold as organic.

All organically raised animals must have access to the outdoors, including access to pasture for ruminants. They may be temporarily confined only for reasons of health, safety, the animal's stage of production, or to protect soil or water quality.Additionally, the National Organic Standard is [51]highlighting some of the key elements of the regulation can aid in understanding the evolution of organic agriculture and the present state of affairs. For livestock production, the National Organic Standard of the USA contains key elements these include:

Origin of Livestock: Essentially, the regulation allows that dairy stock can, in many instances, be transitioned to organic milk production in 12 months. Poultry can be transitioned if under organic management from the second day of life. [52] stated that in general, female mammalian livestock used as brood stock in meat production must be under organic management by the third trimester of the dam's pregnancy. This class of livestock would include such animals as cattle, goats, sheep, hogs and rabbits.

Livestock Feed: Organic livestock must be fed 100% organic feed. Synthetic hormones and antibiotics are prohibited in organic feed; so are plastic pellets, urea, manure and slaughter by products. Synthetic feed supplements and additives are allowed only if they are on the National List.

Living Conditions: When it comes to living conditions, the National Standard reflects the considerable influence the animal welfare community has had on its development. Living conditions must accommodate the natural behavior of each livestock type. Outdoor access, fresh air and sunlight and space to exercise are required. Shelter must also be provided. It, too, must allow natural maintenance and behavior, must provide protection from temperature extremes, have adequate ventilation and be safe. Some specific details include required pasture access for ruminants and provision of bedding, which must be organic if it is consumed. Temporary confinement is allowed only as protection from inclement weather, if required for a specific stage of production, to protect soil and water quality, or to ensure the health and safety of the animals.

Waste Management: Manure must be managed in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, heavy metals, or pathogenic organisms and which optimizes recycling of nutrients. Under ideal circumstances, manure is returned to the land from which feed is harvested, preferably on the same farm.

Health Care: Organic livestock health care begins with prevention. This includes selection of livestock species and type, nutrition, proper housing and pasture, sanitation, stress reduction and vaccination. There are

also restrictions on physical alterations. Producers may not withhold treatment from a sick animal in an effort to preserve its organic status. Sick animals may be treated using natural therapies such as herbs, homeopathic, flower remedies, essential oils, acupuncture, radionics, etc. All appropriate medications must be used to restore an animal to health when methods acceptable to organic production fail. Synthetic parasiticides on the may also be used, but they are highly restricted. External parasites and other pests may be controlled using non synthetic pest means such as traps, botanicals, biologicals and mineral-based materials like diatomaceous earth. Livestock treated with a prohibited substance must be clearly identified and may not be sold, labeled, or represented as organically produced.

According to the East African standards for organic dairy production, animal management allows the animal to express natural behavior, feeding is based on 100% organic feedstuff except in situation where organic feed is no available (maximum 40% of non-organic feed is allowed) and pest and disease management seeks to avoid the use of synthetic drugs [53], thus preventive use of pest treatments is not allowed. Based on these production guidelines organic dairy production aims at sustaining animals in good health, realizing high animal welfare standards and producing milk of high quality.

Organic Agriculture and Food Security at Household Level: There are misconceptions that organic agriculture can further enhance food security problems however, [54] concluded on basis of evidence from projects and modeling that organic agriculture does not increase food security problems, but on the opposite, presents solutions to them both in terms of increased productivity and of improved access to food. Where the yield often drops when converting chemical farming systems to organic production (as is e.g. shown in Europe), but several studies show that yields often more than double when converting from traditional farming systems or through consciously building up soil fertility using purely non-chemical methods [55].

Organic Agriculture can lead to improved food security at the household level. [56] cited the results of a study by the University of Sussex which showed that OA resulted in improvements in food production by smallholder farmers through one or more of the following mechanisms: Intensification of a single component of the farm system – such as home-garden intensification with vegetables and trees; Addition of a new productive animals to a farm system – such as fish in paddy rice - that improved the farm's total food production, income, or both but did not necessarily affect cereal productivity. Better use of natural capital to increase total farm production, especially water (by water harvesting and irrigation scheduling) and land (by reclamation of degraded land), enabling growth of additional new dry land crops, increased supply of water for irrigated crops, or both; and improvements in per-hectare yields of staples through introduction of new regenerative elements into farm systems (for example, integrated pest management) or locally appropriate crop varieties and animal breeds.

[57] stated that one of the impacts of organic farming is food security and stability is that in organic agriculture, a diversity of crops is often grown and many kinds of livestock kept. This diversification minimizes the risk of variation in production, as different crops react differently to climatic and edaphic variations, or have different times of growth (both in the time of the year and in length of the growth period). Consumers' demand for organic food and premium prices provide new export opportunities for farmers of the developing world, thus increasing their self-reliance. Organic agriculture can contribute to local food security in several ways. Organic farmers do not incur high initial expenses so less money is borrowed. Synthetic inputs, unaffordable to an increasing number of resource-poor farmers due to decreased subsidies and the need for foreign currency, are not used. Organic soil improvement may be the only economically sound system for resource poor, small-scale farmers.

Animal Health and Welfare in Organic Livestock Systems: The International Federation of Organic Agricultural Movements (IFOAM) developed four new ethical principles of organic agriculture to guide its future development: the principles of health, ecology, care and fairness [56]. The key distinctive concept of animal welfare in organic agriculture combines naturalness and human care and can be linked meaningfully with these principles.

Animal welfare at an individual level can be understood as three basic concepts: (1) the animal should feel well (referring to its experience, feelings, interests and preferences), distinguishing between welfare as the satisfaction of preferences, or as pleasure (hedonism), i.e., experienced as pleasant feelings along with the absence of unpleasant feelings; (2) it should function well (meeting its needs and being in good clinical health condition); and, (3) it should lead a natural life through the development and exercise of its natural adaptations, with referenceto its innate nature [46]. The emphasis in organic livestock production standards is on:

Table 1: Summary of criticism and counter arguments of organic livestock farming

Criticism	Counter arguments
• Animals under organic management are denied proper veterinary treatment, such as vaccinations and antibiotics, which leads to unnecessary and prolonged suffering.	• Organic livestock management practices reduce the risk of diseases. Preventive practices (such as regular exercise, free access to pasture and/or open-air runs and adequate grazing rotations) stimulate the natural immunity of the animal and increase tolerance to diseases. • Organic farmers are encouraged to use natural and complementary therapies for their animals, including homeopathy, Ayurvedic medicine and acupuncture.
• Natural living conditions include non-hygienic stables and mud, which are sources of disease and bacteria, exposure to which results in animal suffering.	• However, in organic agriculture, access to outdoor areas, appropriate stocking rates and possibilities to express their natural behaviors promote animal health and reduce stress. • Organic farmers are more motivated to keep a good standard of hygiene to prevent diseases.
• Animal diseases such as avian flu are spread because animals are allowed to be outside. If they were all kept indoors, the disease would not spread to animals in holdings.	• However, there is no evidence that keeping birds indoors does anything to stop the spread of avian flu. The highly-pathogenic strains of bird flu are essentially a problem of the transnational poultry industry, which sends the products and waste of factory farms around the world through a multitude of channels.
• Organic farm animals don't grow well and provide high production yields but conventional industrial farms are very productive. • Animals grow more slowly under organic production.	• The health of intensively-bred animals is not the norm, but rather that these animals live permanently in unhealthy conditions and under medical treatment. • However, growth rate is not the only characteristic desired by organic breeders and farmers; they also consider animal longevity, health and adaptability.
• Organic animal husbandry standards are not harmonized worldwide, so it would be best if OA did not try to define anything.	• However, there are indeed variations in organic animal husbandry standards worldwide, to account for different local agro-ecological, cultural, social, economic and technical conditions, but all standards are based on the universal principles of Organic Agriculture. Organic Agriculture is indisputably better able to guarantee high animal welfare than conventional agriculture.
• There are not enough cows in the world to provide enough nutrients in terms of cow manure for today's food crops.	• However, cow manure is not the only source of nutrients for organic farming; other sources of nutrients include, but are not limited to, green manure (leguminous plants), compost, mulch and seaweed.
• Buying organic does not help maintain small family farms since most of the organic food available in the market actually comes from a few large-scale organic farms, often located far from the point of sale.	• However, buying organic does help maintain family farms, improve smallholders' livelihoods and maintain diverse landscapes. Many organic products imported from developing countries (e.g., coffee, cacao, cotton, sesame and groundnuts) are actually grown by very small producers. Buying these products organic helps to sustain the livelihoods of these farmers through premium prices and promotion of sustainable production practices.
• Organic agriculture is labor intensive, which means that an increased burden is placed on families affected by HIV/AIDS or war in developing countries when they practice organic agriculture.	• However, in most poor countries, land and capital (rather than labor) are the limiting factors. Organic Agriculture may require more labor, but it generates increased income through premium prices and reduction of other input costs.
• Organic certification is another protectionist measure designed to maintain the dominance in global markets of producers from developed countries by hampering access by small developing country producer to developed markets.	• However, organic standards are not stricter for imports than they are for domestic products, so they are no disguised protectionist measure. Developing countries have several comparative advantages when it comes to organic production, among which are cheap labor and traditional agro systems that align more closely with organic standards.

- Maintaining closed herds and flocks; i.e. breeding replacements on the farm, so as to minimize the risk of importing diseases from elsewhere and in order to develop stock that are adapted to the specific farm conditions
- Use of organically-produced livestock feed
- Avoiding the unnecessary use of veterinary medicines and pesticides in order to reduce possible adverse health impacts
- Providing animals with the conditions and opportunities of life that accord with their physiological needs, natural behavior and general well-being
- Allowing animals to adapt to local conditions
- Maintaining/cultivating genetic diversity

Organic Livestock Farming and Certification: As organic foods cannot be distinguished from conventional products at a glance, consumers depend entirely on third-

party certification that is the process according to which public or private certification bodies provide assurance that organic products have been produced and handled according to applicable standards. Organic standards have long been used to represent a consensus about what an "organic" claim on a product means and to convey that information to consumers. Certification not only leads to consumer trust in the organic system and products but also gives organic farming a distinct identity and makes market access easier [14]. IFOAM has summarized the criticism and misconception (Table 1) about organic livestock farming and the counter-arguments given by scientists accordingly [59].

CONCLUSIONS AND RECOMMENDATIONS

The already present indigenous knowledge of livestock farming practice, with the availability of cheap labor force and land, the increasing prices of farm inputs in the conventional farming whereas the lower cost of production of organic farming, with achievement of higher margin per unit production through premium price if supported by successive capacity and knowledge building taken as a strategy and the establishment of certifying organizations and promotion of the importance of organic farming to initiate consumers awareness of organic products, its nature of being environmental friendly and capacity to maintain the soil fertility and integrity, its help of farmers on control over their means of production and greater independence will help more farmers of developing countries to initiate and engage in this important farming practice and contribute to the well-being of the environment, the livestock species, the human being in general. Therefore, organic farming is the way towards sustainable development for developing countries.

A well designed policy on organic agriculture with emphasis to organic livestock production should be addressed for attaining three vital aspects of sustainable agricultural development: environmental health through sustainable use of natural resources within and outside the agro-ecosystem; rural development through employment and community empowerment; and income generation through diversification, value addition, marketing and trade.

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