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Agriculture and Agro-industries Development towards Sustainable and Resilient Food Systems to

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Background Report

1. Introduction

2015 witnessed remarkable developments in the global commitment to ending hunger and undernutrition and ensuring food security. Following the success of the Millennium Development Goals in halving global poverty five years ahead of the 2015 deadline[1], with more than 1 billion people lifted out of extreme poverty, and a reduction of the proportion of undernourishment in developing countries of over 40%, the international community achieved another significant milestone with the adoption of the 2030 Agenda for Sustainable Development and of the Addis Ababa Action Agenda (AAAA). Among the 17 goals and 169 targets which will dictate the global development agenda in the next fifteen years, of utmost importance are Sustainable Development Goal (SDG) 2 which focuses on food security and nutrition and sustainable agriculture, and SDG 9 on infrastructure, industrialization and innovation. Food and agriculture lies at the very heart of the 2030 Agenda for Sustainable Development. SDG 2 and its targets are inherently connected to almost all other goals[2].

At the historic Paris Climate Conference (COP 21) in December 2015, 195 countries adopted the first ever universal and legally binding global climate deal which entered into force in November 2016. Through this agreement, the global community including developing countries and countries in special situations[3] have demonstrated their political commitment to delivering climate conscious sustainable development. Recent events such as the tropical cyclones in the Pacific and the El Nino-induced droughts across regions in Africa and change in rainfall patterns in the Dry Corridor of Central America have shown that climate resilience must be a priority for all developing countries. Meeting the SDGs and addressing the threat of climate change will require a profound transformation of food and agriculture systems worldwide including reform in formal agriculture and agribusiness (with investments in, for example, better irrigation, seeds, storage, and processing).
Already, the world's food systems are undergoing a process of significant structural transformation as a result of global social and economic trends such as the burgeoning demographics across developing countries, expansion of the middle-income consumer class, urbanization, and increasing energy and

[1] According to FAO SOFI (2016), 72 countries attained the MDG goal of halving hunger by 2015.

[2] For details on these linkages, see the Report of the Secretary General on Agriculture to the Seventy First Session of the General Assembly, 3 August 2016.

[3] According to the classifications provided by UN-OHRLLS, countries in special situations comprises Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs), and Small Island Developing States (SIDS) http://unohrlls.org/. There is certainly overlap in these categorization. For example, most LLDCs are also LDCs and over half of the LDCs and LLDCs are in Africa.

raw material needs, which have fueled unprecedented demand for agricultural products[4] and competition for land. While countries are going through this stage in different ways and at different speeds, the process has historically been characterized by migration from rural to urban areas particularly of youth seeking decent employment opportunities, a shrinking share of agriculture in GDP, changing food consumption patterns, a shift from subsistence to commercial farming and increased value-creation in the agri-food industry.

It is also well established that industrialization is a *sine qua non* for development. The East Asian economies transformed themselves into industrial powerhouses within a generation, and the unprecedented pace of industrialization in China has lifted hundreds of millions out of poverty and hunger. Despite the overwhelming evidence of manufacturing success in developing countries, a substantial part of the developing world especially in Africa, remains at risk of failing to establish a vibrant, competitive industrial economy (Jerome, 2013). Moreover, it is increasingly becoming more difficult than ever for poor developing countries to foster industrial development as they face a more complex, and daunting set of circumstances[5] than developing countries that embarked on industrialization few decades ago (Szirmai, et. al. 2013). At the same time, new opportunities are provided by resource-based industrialization; the accelerating pace of technological change in manufacturing; and opportunities provided by South-South cooperation and the rise of the BRICS (Kormawa and Jerome, 2014). Agro-industry is often the first rung of the ladder to fully fledged industrialization; a ladder Africa and countries in special situation must climb in order to transform their economy.

Although the contribution of agriculture to GDP is declining in most parts of the world, agricultural production has increased to unprecedented levels globally. Agriculture and agro-industry sectors contribute between 20% and 30% of GDP in most least-developed countries (LDCs). Agriculture is, in many cases, the sector best placed to absorb youth that enter into labor markets - an estimated 10 million a year in Africa alone in the coming years. Changing food systems generate vast opportunities for entrepreneurs to create and grow businesses at each stage of the food value chains, from production to retailing. Agro-industry firms have strong multiplier-effects as they simultaneously generate decent jobs, profits and value-added food products, and create new markets for the raw materials that feed into them from mainly rural areas where most of the poor live. In this structural transformation process, small-scale agro-industries, especially informal agro-industries, play an important role. They are responsible for around 15-20% of value-added food products, although national and regional policies often overlook them. Agro-industrial development also allows countries to shift from exporting raw/unprocessed agricultural commodities to exporting value-added food products that not only generate more jobs and income (foreign currency) but also reduce the country's exposure to excessive volatility of international agricultural prices. Very significantly, this also allows for import substitution, with more value added produces made in country.

It is clear that the successful development of the agroindustry and the promotion of inclusive, sustainable and resilient food systems, can offer developing countries, and indeed LDCs, a strong driver for long-term economic growth. Agriculture and agro-industry are sectors that can generate significant job, market and entrepreneurship opportunities, especially for the burgeoning youthful population. Over time, growth in agro-industry has continued to spur growth in agriculture, which has been shown to have at least twice as much impact on poverty reduction than investment in any other sector (World Bank, 2007).

[4] At FAO, this implies crops, fisheries, livestock and forestry.

[5] The new challenges include the shrinking of policy space; integration into global value chains; the rise of the Asian driver economies; how to deal with jobless growth in manufacturing; and how to respond to the threats of global warming and climate change. See Szirmai, et. al. 2013 for details.

However, challenges faced by developing countries in general, and LDCs in particular, in realizing the above potentials are daunting[6] and have been extensively documented. They include:

- Lack of integrated value chains;
- Unreliable information and analysis to value chain stakeholders and policymakers;
- Lack of incentives for responsible private sector investment in agribusiness;
- Weak industrial capacities and capabilities, including technology know-how;
- Low level of entrepreneurship and institutional support;
- Inadequate energy, water management systems and other infrastructures;
- Incoherent, unsupportive or unpredictable policy environments;
- Supply-side constraints resulting in low labour productivity;
- Weak access to quality and affordable inputs for crops, livestock, fisheries, etc.;
- Weak access to suitable, reliable and affordable mechanization;
- Weak access to (customized) finance and risk management products;
- Lack of investment in agriculture and rural-urban linkages;
- Excessive post-harvest losses; etc.

This background paper addresses issues related to agriculture and agro-industries development towards sustainable and resilient food systems across developing countries and countries in special situation.

2. Developments in Agriculture

Agriculture plays an important role in industrialization and economic growth, particularly in the context of structural transformation (Hayami and Ruttan, 1985). Evidence from the 18th century industrial revolution in the United Kingdom which later spread to other countries, and the Green Revolution in Asia and Latin America suggests that agricultural transformation has been a precursor to and co-factor in the rise of industry and services in countries such as Japan, South Korea, and Taiwan, and more recently, emerging markets such as China, Brazil and Vietnam. Although the contribution of agriculture to GDP and employment inevitably decreases as the economy grows, the current consensus points to the increasing importance of agro-industry.

Agriculture is at the heart of the economies of developing countries, and has underpinned food security, export earnings and rural development. Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity and feed 9 billion people by 2050. According to the World Bank, growth in the sector is also about two to four times[7] more effective in raising incomes among the poor compared to other sectors, especially for the 78 percent of the world's poor who live in rural areas and depend largely on farming to make a living.

The structure of agricultural production in developing countries has radically changed in the last three decades. From the 1960s to 1980s, the "Green Revolution" in Asia and Latin America which led to the development of new seed varieties and crop yields helped to double food production and saved hundreds of millions of lives. In Africa, however, daunting political and ecological challenges inhibited its takeoff. 50 years on, Africa and the world needs to green the Green Revolution, assuring that agricultural production and environmental preservation go hand-in-hand, and also assuring that today´s food systems not only produce enough food but that food security and nutrition is achieved by all.

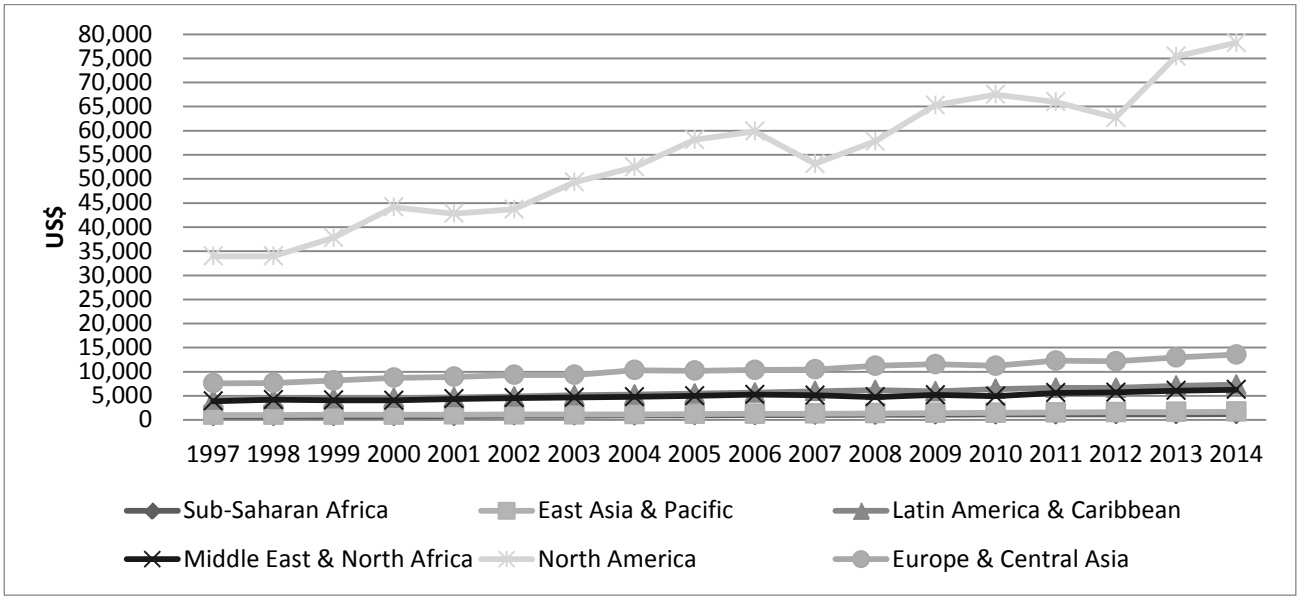
Figure 1 presents value added per worker for the sector by regions from 1997 to 2014. The figure indicates that North America far surpasses the rest of the world with productivity consistently rising

[6] It is important to note that, without adequate support, family farmers and small and medium-sized agro-enterprises in middle-income countries often face challenges similar to those seen in LDCs.

[7] See http://www.worldbank.org/en/topic/agriculture/overview

from USD 34,000 in 1997 to USD 78, 000 in 2014. Following North America is Europe and Central Asia where it grew from USD 7,000 in 1997 to USD 13,000 in 2014. Sub-Saharan Africa and East Asia and the pacific are at the bottom rung with value added per worker consistently below USD 4,000 across the period.

Figure 1: Agriculture value added per worker (constant 2010 US$)



Source: World Development Indicators, 2016.

Despite notable progress, the sector is still bedeviled by many challenges unevenly spread across developing countries, especially Africa where large gaps persist (See Box 1). A profound and prolonged lack of investment in agriculture is evident in many countries – infrastructure is missing or weak especially in rural areas; smallholders and small firms find it difficult to access technology, skills, and finance; while agricultural productivity has remained stagnant or severely constrained by low technology and inadequate infrastructure. Due to a myriad of factors including ad-hoc surplus production, small geographical spread and the prevalence of subsistence agriculture, small-holder farmers are also poorly connected to the agri-food supply chain. Often, there is also a gender divide. Although women make significant contributions to the rural economy, they have less access to productive resources than men, and families often rely on children for farming activities. On average, women make up about 45% of the agricultural labour force in developing countries, but they are often discriminated against in access to productive resources and inputs, often as a result of local traditions and socio-cultural factors.

The reaffirmation of the sector's role in development and growth provides fresh impetus to foster investments that raise productivity and incomes in the sector. Contemporary agricultural policy agenda needs to address at least four sets of challenges:

- Reduce poverty and hunger —FAO estimates that about 795 million people of the 7.3 billion people in the world, or one in nine, suffered from chronic undernourishment and 2 billion people from malnutrition between 2014 and 2016 despite the notable successes in Asia. Almost all the hungry people, 780 million, live in developing countries, representing 12.9 percent, or one in eight, of the population of developing countries (FAO, et. al. 2015);

- Mitigating rising food prices against the background that a spike in world food prices has regained momentum after the 2007-08 crises. High staple food prices across the world has heightened food related protests not just in the MENA region where they have contributed to

regime change but also in Sub Saharan African Africa, East Asia and Latin America (Bush and Martiniello, 2017).

- Addressing the interest of small-scale producers who account for a large proportion of global agriculture and food production. According to FAO (2015), more than 90 percent of the 570 million farms worldwide are managed by an individual or a family, relying predominately on family labour. These farms produce more than 80 percent of the world's food, in terms of value. Globally, 84 percent of family farms are smaller than 2 hectares and manage only 12 percent of all agricultural land.

- Agriculture is both a contributor to climate change, accounting for 25% of greenhouse gas emissions, and is adversely affected by it. Unless action is taken now to make agriculture more sustainable, productive and resilient, climate change impacts will seriously compromise food production in countries and regions that are already highly food-insecure (FAO, 2016). Global cereal yields, for example, are projected to fall by 20% by 2050 due to climate change. Adoption of climate-smart approaches — including low-carbon policies, zero-till farming, and climate-ready crop varieties such as C4 rice can help meet these goals. A shift to agro-ecological modes of production is also being encouraged.

Box 1: Developments in African Agriculture

While Africa has the highest area of uncultivated arable land (202 million hectares) in the world, about 50% of the global total, its productivity considerably lags behind other developing regions. Yields are only 56% of the international average (African Development Bank, 2016a), and private sector involvement beyond production remains relatively underdeveloped, especially in upstream activities such as seed and fertilizer distribution, as well as downstream activities such as dry and cold storage and agro-processing . Further, Africa has steadily lost competitiveness in global export markets over the past 50 years. The value of agricultural exports from Thailand, which has less than 10 percent of Sub-Saharan Africa's population, is greater than exports from the whole of Sub-Saharan Africa. Likewise, the value of Brazilian exports is 150% higher than the value of African exports (Green, 2013). African countries have made little progress in value-added exports, beyond horticulture.
Nevertheless, some progress has been recorded in recent times. In 2003, the African Union Heads of State and Governments adopted the Comprehensive Africa Agriculture Development Programme (CAADP), committing to a range of initiatives and spending priorities with a view to achieving 6% annual growth in agriculture. African leaders agreed to spend 10% of their national budgets on agriculture by 2008. This target has proved to be overly ambitious though as the share of government spending in the sector fell over time. Africa's public agriculture expenditure was 6.6 % in 2003–2008, but declined to 2.3 percent in 2008–2014, reflecting the considerable impact of the global food and financial crises on both fiscal revenues and Official Development Assistance (ODA). Although the volume of public agriculture expenditure has increased over time, the amount spent as a share of total public expenditure has been less than 4 percent per year for Africa as a whole, far short of the CAADP target of 10 percent (AGRA, 2016). In 2014, African countries spent altogether US$12 billion on agriculture, far short of the US$40 billion target for that year (African Development Bank, 2016b).

In January 2014, on the tenth anniversary of CAADP, the African Union created a new momentum with the proclamation of the year 2014 as the "Year of Agriculture and Food Security in Africa". In the June 2014 Malabo Declaration on "Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, African leaders made a bold pledge to end hunger in the continent by 2025, resolving to, among others, accelerate agricultural growth by at least doubling current agricultural productivity levels by the year 2025, improve nutritional status with a view to bringing down stunting to 10% and the number of people underweight to 5% by 2025, and tripling intra-African trade in agricultural commodities and services by the year 2025.

The "seize the moment" campaign launched in Accra in April 2016 recognizes the significant progress African countries have made over the last decade in revitalizing the agriculture sector both on and off the farm across the entire value chain and called for both public and private investment in modernizing the sector.

3. The Changing Food Systems

FAO 2013 defines the food system as: "the entire range of activities involved in the production, processing, marketing, consumption and disposal of goods that originate from agriculture, forestry or fisheries, including the inputs needed and the outputs generated at each of these steps. Food systems also involve the people and institutions that initiate or inhibit change in the system as well as the socio-political, economic and technological environment in which these activities take place".

The global food system needs to be reshaped to achieve a whole range of SDGs. While it feeds 7 billion people, it leaves 795 million people hungry and about two billion micronutrient- deficient, many of them in Africa and South Asia. It does not generate adequate livelihoods for millions of people employed in the food system; it is not environmentally sustainable, and about one-third of total agricultural production is lost or wasted every year.

In a world of growing complexity and uncertainty, the security of food supplies is threatened by many factors. Climate change, soil degradation, pest outbreaks, economic and political crises, and population growth are major factors adding pressure to the global food system (Caiazza and Volpe, 2012 and Reardon, 2016).

Growth in the world's cities is exploding. More people live in urban areas (54 % in 2014) than in rural areas. Feeding urban populations has become an urgent and critical challenge, especially in low- and middle-income countries in Asia, Africa, and Latin America. Estimates by UN (2015) indicates that continuing population growth and urbanization would add 2.5 billion people to the world's urban population by 2050, with nearly 90% of the increase concentrated in Asia and Africa, fueling an unprecedented demand for food.

The changing food consumption pattern is also altering the demand for food. As cities grow, diets are changing. There is greater demand for processed foods, dairy, meat products, and fresh fruits and vegetables as a result of rising incomes and urbanization. The nutritional impact of the increase in consumption of products with higher nutritional values is potentially very positive. However, the rapid increase in the consumption of processed foods that has accompanied rising incomes and urbanization has tended to lead to the increasing prevalence of overweight and obesity. Some 1.4 billion people are estimated to be overweight globally, with 500 million of them obese (FAO, 2013). Today's food systems are also overly focused on food quantity rather than food quality.

The multiple forms of malnutrition will continue to accelerate unless policy makers and business leaders deliberately work in concert to reshape food systems in ways that will advance the goal of healthier diets for all. The societal costs of malnutrition are quite high. IFPRI (2016) estimates that 11 percent of gross domestic product (GDP) is lost every year in Africa and Asia due to malnutrition. Every year, global GDP losses from malnutrition are greater than what was lost each year during the 2008-2010 financial crisis.

The Global Panel on Agriculture and Food Systems for Nutrition (2016) warned that unless policy makers act decisively to control overweight, obesity and diet-related diseases, countries will pay a heavy price for high mortality, poor physical health and mental well-being, economic loss and environmental degradation. The stark message to world leaders is that only a response on the scale and commitment used to tackle HIV/AIDS and malaria will be sufficient to meet the challenge. Also noteworthy are the potential environmental threats associated with dietary transitions towards more meat-based diets, which are less efficient per calorie produced.

Another development is the rapid spread of supermarkets which are increasingly becoming the dominant outlets of food products, from fresh vegetables produced by farmers to foods processed by

multinational companies (MNCs). The 'supermarket revolution' in developing countries which started in the early 1990s (Reardon et. al. 2003) has continued to the present. The roll-out has occurred in several phases. The first wave occurred in Latin America, and Central Europe in the early 1990s, the second-wave in Asia in the mid-2000s and the third wave has been in China, Vietnam, India and Russia in the late 1990s and 2000s (Reardon et. al. 2005).

In Africa outside South Africa, which belongs to the first wave, the supermarket revolution is just catching up fueled largely by South African firms, which are extending and expanding their reach to the rest of the continent. Local supermarket chains are also rapidly picking up in some countries, e.g. in Uganda; in Kenya as well as in Zimbabwe. The spread of supermarkets has led to important restructuring within the agro-food systems in many countries including rapid changes in the procurement systems. Supermarkets imply for example for fresh produce, centralized procurement, i.e., larger volumes, regular supplies, standards compliance, non- collect on delivery payment terms, etc. Surprisingly, the relationship between the supermarket-driven food systems and human health is not quite an issue yet for developing countries and studies are only just emerging. With poor diet being a key determinant of some of the biggest health issues facing the world (obesity, type 2 diabetes, cancer), a health narrative will soon be a major issue.

A major inefficiency lies in food losses and waste. One-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year (FAO, 2011)[8]. In some African, Caribbean and Pacific (ACP) countries, where tropical weather and poorly developed infrastructure contribute to the problem, food loss can regularly be as high as 40-50% (SPORE, 2011). Food losses refer to the decrease in edible food mass throughout the part of the supply chain that specifically leads to edible food for human consumption. Food losses take place at production, postharvest and processing stages in the food supply chain. Food losses — occurring at the production, harvest, post-harvest and processing phases — are most important in developing countries, due to poor infrastructure, low levels of technology and low investment in the food production systems. Food losses occurring at the end of the food chain (retail and final consumption) are rather called "food waste", which relates to retailers' and consumers' behavior and it is mainly confined to industrialized countries. (FAO, 2011). Obviously, one way of strengthening food security is by reducing these losses and waste. Improving infrastructure, technology, transportation, and distribution along the supply chain to reduce food loss, and educating consumers about food waste is critical.

Resilience is a key dimension. With so much uncertainty and complexity, food systems must be able to fulfill their goals, even in the face of multiple, unpredictable drivers of change. The concept of resilience is increasingly used to address the above challenges. Food systems resilience is defined as "the capacity over time of a food system and its units at multiple levels, to provide sufficient, adequate and accessible food to all, in the face of various and even unforeseen disturbances" (Tendall, et al. 2015, p. 19). FAO has recently advocated building resilient food systems in various contexts (FAO, 2013). These include macroeconomic resilience, which enables markets, trade and institutions to respond to unforeseen events including disasters, and microeconomic resilience, which focuses on the most vulnerable segments or populations within the food system. Building resilience in the agriculture and food sectors will require investment in innovative policies and systems.

4. Agro industries in Developing Countries

[8] See http://www.fao.org/news/story/en/item/74192/icode/

Agro- industry has been defined by FAO (1997 and 2009), as "a subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector". It broadly translates as post-harvest activities involved in the transformation, preservation and preparation of products that originate from agriculture, forestry and fisheries for intermediary or final consumption.

It encompasses all activities starting from harvests, transformation, storing and preparation of agricultural raw materials for production or final consumption (Wohlmuth, and Kormawa, 2012). The industry's focus is on production and food processing, but it should not be wrongly identified with the food industry, which entails processing agricultural raw materials into food and beverages (Marsden and Maurizio 1998). The agro-industry is very diverse with hybrid characteristics and heterogeneous features, ranging from the informal contract relations of poor rural communities to the complex, transnational activities of global players (Henson and Cranfield, 2009). It is also intensive in resource use and heterogeneous on the level of industrial and technological intensity (Wilkinson and Rocha, 2009). The defining characteristic of the agro-industrial sector is the perishable nature of the raw materials it employs, the supply and/or quality of which can vary significantly over time. Agro industry also has some linkages with sustainable and resilient food systems (Box2).

Box 2: Linking Agro Industry and Resilient Food Systems

The 2030 Agenda for Sustainable Development clearly shows that transition towards environmentally, socially and economically sustainable food systems is a must for achieving sustainable development and specifically sustainable food and nutrition security for present and future generations, including feeding 9 billion people by 2050.

A better understanding of food systems means comprehending issues at play from 'farm to fork' i.e. production (crop, animal, seafood), processing, trade and distribution, and consumption as well as cross-cutting issues such as gender, innovation and technology. Such a deep knowledge and consequent corrective actions are crucial to address the multiple challenges and dysfunctions of the current global food system such as food insecurity, obesity, food waste, climate change, biodiversity loss, land degradation, water depletion, deforestation, market concentration and food heritage erosion (Moscatelli, et. al. 2016).

Agro- industry is a decisive component of our food system as it intermediates raw material production in the rural context and consumption in the urban milieu working along the supply chain (UNIDO, FAO, IFAD, 2008). A sustainable systems-based approach to the global food system is clearly needed. This is the justification for the push for agriculture and agro-industries development towards sustainable and resilient food systems across developing countries and countries in special situations.

The conventional agro-industry divisions according to the *International Standard Industrial Classification*, includes six main sub-sectors: (i) food and beverages; (ii) tobacco products; (iii) paper and wood products; (iv) textiles, footwear and apparel; (v) leather products; and (vi) rubber products.

Agro-industrial sectors generally account for a substantial part of industrial output in developing countries[9] compared to industrialized ones. This is particularly true in the case of Africa, where the share of the agro-industrial sector in total manufacturing could be as high as 50%.

Among the agro-industrial subsectors, the food and beverages subsector has a particularly strong presence in both industrialized and developing countries; however, its size relative to total manufacturing varies significantly. In industrialized countries, it contributes well below 20% of the total value added of the manufacturing industry, while its share is much higher across developing countries.

A recent development is the increasing role of private investment in this sector. Several private equity and venture capital firms—both agricultural specialists and generalists—have identified the agro

[9] Recent data on the sector virtually do not exist.

industry and agribusiness in general as an attractive sector. Records of private equity investments in emerging markets agribusiness documented by Credit Suisse et. al. (2015) indicates that 153 private equity firms invested in 283 agribusiness deals in emerging markets between 2008 and 2014, with aggregate annual investment ranging from US$643 million to US$2.6 billion. Geographically, Latin America raised the most capital between 2008 and 2014—approximately US$1.9 billion in total—though there has been a discernible shift toward Asia and Sub-Saharan Africa since 2010, with accumulated investment of US$2.1 billion and US$1.3 billion, respectively, over the last seven years. By country, Brazil has attracted the largest amount of investment—nearly US$1.5 billion compared to US$356 million for China, which ranked second.

Unlike emerging Asia's concentration of activity in two countries, Sub-Saharan Africa exhibited rich diversification, with 21 countries receiving investments. With its abundance of land, Sub-Saharan Africa has become a popular destination for global investors, most especially by sovereign wealth funds, though some of them have been accused of land grabbing.

A study commissioned by UNDP in 2012 indicates that the private sector in Africa is gradually extending its roles as off-takers to providing more value-added services through forward integration of agro-input suppliers, backward integration of agro-processing firms and supermarkets, provision of extension services and employing innovative financing and market systems to enhance productivity. A case in point is Kaizen Venture Partners which have helped turn around distressed coffee processing companies in Rwanda. A relatively small group of very large multinational corporations (MNCs), spreading their reach across the globe are playing major roles in agro business.

Globally, the agro-food industry exhibits high levels of concentration and this has undergone increasing consolidation in recent decades with several mega-mergers especially by input supply firms. Fuglie et. al. (2011) present concentration measures for the global agricultural input market and demonstrate that the top 8 companies account for over half of global sales of pesticides, seeds, farm machineries, and animal health products. Moreover, the market share of the top eight has risen substantially over the past 15 years, attesting to rising industry concentration at the global level.

Nonetheless, private investment in the sector is still small and a number of factors constrain small- and medium-scale agro-based enterprises. At the macro level, many policies implemented by governments have served to hinder the development of small-scale industries, including related to foreign exchange rates and energy provision. Although many countries have implemented major policy reforms over the past two decades, their business environments are still far from being conducive for agribusiness and agro-industries. The World Bank Enabling the Business of Agriculture 2016 report which measures regulations that can impact firms in the agribusiness value chain, in seed, fertilizer, machinery, finance, markets and transport shows that the regulatory quality and efficiency in South Asia and Sub-Saharan Africa are the lowest in the world. In fact, Burkina Faso, Burundi, Ghana, Myanmar and Niger score below average on all topics covered. At the firm level, several factors collude to inhibit the development and they hold sway in all developing countries though in varying proportion. These include limited access to credit and foreign currency; poor technological capability; unreliable supply of raw materials; poor managerial and technical skills; poor product quality control; and poor markets amongst other factors.

A major limiting factor for firms in developing countries especially small-scale firms in the agro industry sector is the rapid proliferation of industry standards and quality requirements. Over the past decade, many agribusiness firms, industry organizations and consortia have been developing their own standards and quality requirements, which typically surpass public standards. Many developing countries are also ill-equipped to take advantage of the opportunities provided by trade. Recent health concerns arising from bovine diseases, bird flu and various toxins entering the food chain have led to stringent standards and conformity procedures, particularly in agro-food exports. Exporting countries must thus acquire the capability to conform to requirements in terms of quality, safety, health and the environment if they are to participate fully in global markets.

5. Innovative Approaches and Good Practices around the World

There are several innovative and good practices all over the world targeted at developing agro -industry and agribusiness in general that can be scaled up. Some of them are novel, such as FAO's promotion of inclusion of rural disabled through agro-and rural enterprise development in the Asia and pacific region[10]. What follows is a selective review.

High-level programs in Africa

The Agribusiness and Agro-industries Development Initiative (3ADI)

As an outcome of the High-Level Conference on the Development of Agribusiness and Agro industries (HLCD-3A) held in Abuja (Nigeria) in March 2010, a follow-up to the Global Agro-Industries Forum (GAIF) held in New Delhi (India) in 2008, the Agribusiness and Agro-industries Development Initiative (3ADI) was established with the objective of increasing private sector investment flows into the agriculture sector in African countries by mobilizing resources for agribusiness and agro-industrial development from domestic and international financial systems.

The program, among others, aims to significantly increase the proportion of agricultural produce in Africa that are transformed into differentiated high-value products, such that by 2020 more than 50 percent of Africa's food products sold in local and national markets are in the processed form, and that the proportion of Africa's agricultural exports that are processed into final consumer products more than doubles, fully meeting food safety standards demanded by African consumers and in the global market. Significantly, the 3ADI program has gone beyond the initially envisaged geographic coverage. Interest in the initiative has also waned in recent years and there is need to resuscitate it.

African facility For Inclusive Market Development (AFIM)

In November 2010, the UNDP launched the African facility for Inclusive Market Development (AFIM) as a continental platform to engage the private sector. It is working to accelerate progress toward the SDGs by supporting the development of inclusive and pro-poor markets across Africa. The platform facilitates knowledge sharing and access to finance, advances tangible value chain projects, and disseminates best practices in market development where the emphasis is on creating opportunities for low-income groups – especially women and youth. AFIM focuses on agriculture and agribusiness. Thus far, AFIM has assisted 34 UNDP country offices and governments to improve their capacity to promote value chain development and regional cooperation. It has also undertaken and published several mappings and studies on the 'Roles and Opportunities of the Private Sector in Africa's Agro-Food Industry' and 'Inclusive Business Finance'. It co-organised the Agribusiness' Forum 2011 (in Johannesburg) and 2012 (in Dakar). AFIM, over time has built an alliance of IMD partners, including the African Development Bank, the African Union Commission (AUC), NEPAD Planning and Coordination Agency, the Pan-African Agribusiness Consortium (PanAAC), Regional Economic Communities (EAC, ECOWAS, COMESA), UN agencies and bilateral development partners.

Agribusiness and food value chain approaches at the United Nations

In recent years, governments, donors, and NGOs have increasingly embraced agribusiness and food value chain development (VCD) for stimulating economic growth and combating rural poverty. Within the UN system, the following are some examples:

- FAO is currently developing a set of twelve entrepreneurship case studies in Sub-Saharan Africa which will not only provide key policy advice to incubator programs but also provide learning

[10] See FAO (1998). The "Midas" Touch: Food and Agro-industries for Income Generation by Disabled People. [FAO Regional Office for Asia and the Pacific, Thailand].

materials. FAO is also implementing the Technical Cooperation Programme (TCP) 'Support for the establishment of a continental agribusiness platform and capacity building for effective agribusiness development in Africa' in cooperation with AU.

- UNIDO is the leading UN agency supporting industry development. It has strong expertise worldwide in supporting value addition in agriculture in developing and transitional countries. The organization has taken part in some of the seminal works on the concept of global value chains and its application to specific industries such as the global apparel industry, the agri-food sector and the global furniture industry (ILO, 2011). In recent years and at the operational level, UNIDO has played a key role in the development of leather value chains in East Africa and the cotton value chain in West Africa.

Box 3: Illustration - FAOs Roots and Tubers project:

Value chain models aimed at linking farmers to markets have often focused on high value crops such as coffee, fresh vegetables and cocoa that target export markets and involve global agri-food firms. However, most of the food produced by smallholder farmers relates to staple foods marketed in local markets and involve small and medium-sized national enterprises (SMEs). In view of this, FAO's fieldworks have placed a strong focus on these markets and firms. A prominent example of such an inclusive business model is the €5 million "Strengthening linkages between small actors and buyers in the Roots and Tubers Sector in Africa" project funded by the EU. The project runs from 2014 to 2018 in seven countries (Rwanda, Uganda, Malawi, Cote d'Ivoire, Cameroun, Benin, and Ghana). In each of these countries, promising business models are identified and supported through the facilitation of a farmer-SME interaction. The project is structured around improving the competitiveness of roots and tubers value chains through inclusive business models, sustainable intensification of production, SME capacity and farmer organizations' capacity; and improving smallholders' access to information services, finance and climatic risk management instruments. At the same time, the project facilitates an exchange of experiences on what works and what doesn't, thus stimulating replication and promoting impact at scale.

- Typically, UNDP acts as either a broker or a partner or both in facilitating value chain development. The main objective is to make value chains not only more competitive but also pro-poor and environmentally sustainable. Some of its activities include the following:
  - The "Africa Facility for Inclusive Markets" (AFIM) provides support to VC-related initiatives in the region, including select cross-border value chain initiatives with a focus on facilitating employment and income opportunities for youth and women in Africa.
  - As part of the EU/UNIDO/UNDP support program in Armenia, the second EUR 2.5 million joint UNDP and UNIDO complementary support project implemented between 2014 and 2016 focused on (1) strengthening and newly establishing producer groups, (2) engaging producer groups effectively in value addition and (3) strengthening value chains that provide improved access to affordable, better quality food. The project targeted training of at least 3,000 farmers, and 10 producer groups engaging in new and improved ways of value addition with products from assisted producer groups attaining at least 10% premium price and 20% increase in annual turnover.
- The rising interest in value chains led to the creation of the United Nations Value Chain Development Group (UN VCD group) in Geneva in July 2010 by experts from seven UN agencies. The objective of the UN VCD group are to: i) increase the coherence of the UN's work in value chain development; and ii) enhance learning, coordination and collaboration among UN agencies in the formulation and implementation of value chain development initiatives at country and regional levels. The interagency group whose work is mainly voluntary, meet

intermittently to explore synergies and share best practices among UN agencies that work in value chain development.

- Development practitioners around the world are learning valuable lessons from both successes and failures of value chains, but many of these are not effectively disseminated. To cover this void, FAO in its role as a global knowledge broker recently launched a set of handbooks on sustainable food value chain development (SFVCD), beginning with FAO 2014[11], to provide practical guidance on SFVCD by facilitating the spread of innovative solutions emerging from the field to a target audience of policy-makers, project designers and field practitioners.

Entrepreneurship incubator programs

Entrepreneurship and innovation in agribusiness and agro industry offer tremendous opportunities for many developing countries. Yet few instruments exist to help low-income countries with a comparative advantage in agriculture advance the competitiveness and growth of local growth-oriented companies. Agribusiness incubation—a holistic service focused on enabling the growth of innovative early-stage enterprises—is one vehicle that can be utilized.

The World Bank Group global partnership program (infoDev),

infoDev is a global program within the World Bank Group that works at the intersection of innovation, technology, and entrepreneurship. InfoDev's Agribusiness Innovation Program (AIP) seeks to promote the success of pioneering agro-processing entrepreneurs by offering access to a holistic service offering that includes financial, market linkage, technology, and business development services. The ultimate purpose is to catalyze the green growth of a competitive agro-processing sector and, in turn, harness greater development gains in the form of inclusive and sustainable growth and job creation. Over a ten year period, Phase 1 of the AIP is envisaged to create 33,500 jobs, increase the number of SME firms and increase farmer incomes by more than $190 million and benefit more than 23,000 women.

The Netherlands-funded 2SCALE

At the bilateral level, there are also several promising initiatives. The Netherlands-funded 2SCALE project is one of the largest agribusiness incubators in Africa, working with farmers and small-scale entrepreneurs to improve rural livelihoods and food and nutrition security in nine countries in Africa. 2SCALE is a Public-Private Partnership that encloses the entire agricultural value chain with its actors. The project is targeted at building agribusiness clusters, strengthening business support services and assisting in developing the base of the pyramid products and markets. It focusses on four themes that cut across the chain: youth employment, access to Information, women inclusion and access to finance.

The Agri-Business Incubation (ABI) Program of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Most recently, agribusiness incubators became one of the important methodologies for promoting industrial development in Africa. For example, the Agri-Business Incubation (ABI) Program of ICRISAT, as main partner of the UniBRAIN, was entrusted with the task of handholding and mentoring the six freshly established Agribusiness Innovation Incubator Consortia (AIIC), and assist UniBRAIN in upscaling the incubator model to other countries within Africa. Following its success, the African Agribusiness Incubator Network (AAIN) together with the Forum for Agricultural Research in Africa (FARA) are currently working on the establishment of incubator networks across Africa. The main idea of the incubator is to work along commodity value chains offering services and facilities to accelerate new

[11] See FAO. (2014). Developing Sustainable Food Value Chains – Guiding Principles. Rome

enterprises, scale innovations, commercialize scientific knowledge and technologies. The main challenges and lessons learned from this program were discussed in the 2016 Second Pan-African Agribusiness Incubators Network Conference and Expo held in Kenya.

Youth Development Programs

Several initiatives aimed at building the capacity of the youth in areas such as business skills, entrepreneurship, leadership and personal development are also springing up. Successful programs include the Young Professionals for Agricultural Development (YPARD) initiative implemented by the Global Forum on Agricultural Research (GFAR), in various countries around the world. In 2012, the International Institute of Tropical Agriculture (IITA) in Ibadan, Nigeria, also launched the IITA Youth Agripreneurs (IYA) initiative. The program is aimed at exposing young people to the opportunities inherent in agriculture for job creation and employment, and supporting them to explore channels that are open to businesses in agriculture. These include areas such as the specialization and production of quality seeds; value addition through processing; fisheries and brood stock production; marketing and use of ICT in agribusiness.

Technological Innovation

New technologies are also being tested, that reduce the drudgery of agro-processing and improve efficiency, such as a mechanical sheller that can shell 18 times more groundnuts in one hour than hand shelling, and processors that can turn cassava peels into high quality animal feed. The Business Incubation Platform (BIP) of IITA in Nigeria has set up mini plants for the production of key agricultural inputs, as models for private sector engagement. A key product from the IITA BIP is aflasafeTM for addressing the problem of aflatoxin contamination in grain and other crops. The aflasafeTM plant produces up to 40 tons of aflasafeTM a day and the BIP's main goal is to get interested parties to invest in plant construction and laboratories all over Africa.

BioInnovate Africa Programme

The Bioresources Innovations Network for Eastern Africa Development (BioInnovate Africa) Programme is a regional initiative supported by the Swedish International Development Cooperation Agency (Sida) to assist countries in eastern Africa benefit from the revolutionary advances in biosciences, converting these technologies into innovations for inclusive growth and sustainable development. BioInnovate is based at the International Centre of Insect Physiology and Ecology (icipe) in Nairobi, Kenya, and currently operates in six eastern African countries namely: Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda. The Programme aims to improve the lives of smallholder farming communities in eastern Africa by making agro/bio processing a more competitive and environmentally sustainable enterprise. It supports scientists and innovators in the region to link biobased research ideas and technologies to business and the market, with the goal of not only translating bioscience research outputs for beneficial societal use, but also expanding opportunities for creating new jobs, increasing household incomes and reducing poverty in a more environmentally sustainable way.

Agro corridors

Agro corridors are increasingly being used as a tool to promote inclusive agribusiness and agro-industry development in low- and middle-income countries. The strength of this approach is its integration of investments, policy frameworks and local institutions. The defining feature of these corridors as indicated by FAO (2014) is that they integrate investments in infrastructure, policy and regulatory frameworks, and institutional strengthening and capacity building. They draw private capital and large-

scale investment to projects that benefit smallholder farmers and boost food and nutrition security in lower-income countries.

FAO in a recent report, reviews in detail six case studies, including three well-advanced corridor programmes in Central Asia, the Greater Mekong Subregion in Southeast Asia and Peru; and three new projects still largely in the early implementation phase, in Indonesia, Mozambique and Tanzania (FAO, 2014). These players include a regional bank (Asian Development Bank, a bilateral government agency (USAID), an international multi-stakeholder partnership (World Economic Forum's New Vision for Agriculture) and the Government of Indonesia. Despite their diversity, these corridors assisted in improving physical connectivity and functioning of markets, while at the same time generating economies of scale.

Statistical Data Development

FAO in collaboration with major data generating agencies is also implementing a major project aimed at developing national statistics on the middle parts of value chains, i.e. parts directly linked to agro-industry. The main objective of this initiative is to provide effective and evidence-based information on value addition in the agro-industry (for both informal and formal channels) for policy makers and investors. Because these data are missing, policy decisions are jeopardized and the inflow of foreign capital is limited.

6. Recommendations based on lessons learned

Supported by innovative approaches, agriculture, agro-industry and value chains have significant potentials to contribute to green industrialization and sustainable development across all countries, especially in Africa and countries in special situations.

Experiences from agro-industry support programmes in LDCs in Africa, Asia and the Small Island Developing States (SIDS) point to several core elements of successful agro-industrial development programs. These elements include:

- *Enhance_value chains skills and locally-adapted technologies* by supporting specific promising industries and promoting integrated value chains;
- *Implement enabling policies, provide more effective public goods and promote innovative public institutions and services*;
- *Upgrade financing and risk management mechanisms*;
- *Address market infrastructure, regional trade integration, harmonization of trade policy, and national/regional economic corridors to promote trade in agricultural commodities*; and
- *Ensure stable macro-economic conditions, such as foreign exchange rates, consistent government policies and energy provision*.

Overcoming such challenges to take advantage of emerging opportunities in the restructuring food systems in a sustainable manner will require integrated solutions that are based on a sufficiently holistic analysis of food systems[12]. By tackling the root causes of underperformance and by intervening at the leverage points in food systems, impact at scale can be achieved.

[12] For example, see FAO's Sustainable Food Value Chain (SFVC) approach - http://www.fao.org/3/a-i3953e.pdf.

In general, the recommended approach emerging from past experiences is to shift from fixed-duration project-based programmes of mainly public sector investment into agro-industries development to long-term partnership-based collaborative efforts of the public and private sectors.

High levels of investments are required to unleash the potential of agriculture for sustainable development and poverty reduction in developing countries. Given the vital role of smallholders in investing in agriculture and food systems, it is particularly important that their capacity to invest be strengthened and secured by engaging with and promoting responsible investment by all major actors in accordance with the Principles for Responsible Investment in Agriculture and Food Systems[13].

Realizing that low public budgetary allocations to the sector have slowed growth, effective public-private partnerships or Agri-PPPs, the sort being promoted by FAO are recommended[14]. They have the potential to help modernize the agriculture sector and deliver multiple benefits that can contribute towards sustainable agricultural development that is inclusive of smallholder farmers.

Few governments have developed a coherent vision[15]for agro-food system and agro-enterprise development. A multi-sectoral approach is needed which cuts across operational silos. Systemic and multidimensional perspectives are also needed as are a mixture of policy, capacity-building and project-centered activities. Governments need to rethink industrial policies to align them with agricultural policies.

Recent experience has amply demonstrated that there are no magic bullets to address the complex set of challenges facing agro-enterprises and the poor in agricultural market development. It is vital to ensure that the agro-industry is supported by a coherent set of policies, including on technology development, education, imports, taxation and subsidies, extension services, energy, information and communications technology, infrastructure, food safety, health, access and titles to land, investment promotion, and so on. Traditional approaches to agriculture and agro-industry development focused mainly on a narrowly defined, short-term economic efficiency in production with little consideration for the externalities generated (e.g., polluted rivers, greenhouse gas emissions). Today´s challenges related to climate-change urge us to go beyond these traditional agro-industry development approaches, adapting and scaling up efforts to include the participation of a wide number of farmers and agribusiness in promoting the use of greener technologies that can ensure productivity while preserving the environment and addressing climate change, and support healthy diets and adequate nutrition of the entire population.

This holistic triple-bottom line view (economic, social, environmental) calls for the adoption of a sustainable food systems approach, in line with the goals set in the 2030 Agenda for Sustainable Development, in particular SDG 1 (poverty eradication), SDG2 (hunger, malnutrition and sustainable agriculture), SDG 8 (decent work and economic growth), SDG 9 (infrastructure, industrialization and innovation), SDG13 (climate change), SDG14 (oceans) and SDG15 (land).

By applying a “Sustainable Food Systems” approach to the development of national and regional development plans, policy makers will be able to ensure impact on food insecurity, poverty and malnutrition in rural and urban areas simultaneously. Such an approach will also acknowledge the

[13] The Principles for Responsible Investment in Agriculture and Food Systems endorsed by the Committee on World Food Security (CFS) on October 15th, 2014 builds on the earlier adopted seven principles for responsible agricultural investment that respects rights, livelihoods and resources (PRAI). Though voluntary and non-binding, they represent broad agreement by all major stakeholders on how to chart responsible investments.

[14] See FAO. (2016). Public–Private Partnerships for Agribusiness Development – A Review of International Experiences, by Rankin, M., Gálvez Nogales, E., Santacoloma, P., Mhlanga, N. & Rizzo, C. Rome, Italy.

[15] Countries with good policies include Brazil, China, Chile, Ethiopia, Hungary, Malaysia, Mexico, Tanzania, Thailand, Taiwan, and Vietnam. Argentina, India and Mauritius have dedicated Ministry of Agro-industry.

"social and environmental price" of food and thus ensure that the right incentives are in place for nutrition and environmental-sensitivity in food value chain development.

7. How ECOSOC and the UN development system, with other partners, can work effectively to support inclusive, sustainable and resilient agriculture and agro-industry

The challenge of feeding a growing world population that would be about 9 billion by 2050 and the changing food systems can only be met through vibrant, productive, profitable and sustainable food and agriculture sectors, particularly in developing countries where the bulk of food is grown and consumed. A comprehensive transformation of the agriculture sector in Africa and countries in special situation towards agro-allied industrialization requires investments in infrastructure, education and skills development, technology and innovation. These countries must also endorse a green agriculture to industrialize in a sustainable way, in order to avoid long run stagnation in crop production and rising cost of inputs.

The stakes are high for the agriculture community as they must ensure food security by adopting sound strategies that will attract investment, develop infrastructure, improve yields, reduce costs, and ultimately drive sustainability and profit. With the global slump in commodity prices which has devastated several commodity dependent countries, it is an auspicious moment to promote agro-industry and commodity based industrialization in general. ECOSOC and the UN development system can take a lead in pushing for the transformation of these economies.

Specifically, ECOSOC using its convening power should bring these issues to the front burner both during the Special Meeting on "Innovations for Infrastructure Development and promoting Sustainable Industrialization" at UN Headquarters in May 2017 as well as in its role in promoting sustainable development, advancing policy integration and guiding operational activities for development. ECOSOC could also take the lead in the revival and upscaling of the initiatives appraised in Section 5 such as the 3ADI. The UN Bodies including FAO, UNIDO and UNDP should also step up their role in promoting resilient agriculture and agro-industry.

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