"Gaps, challenges and progress in boosting agricultural productivity and ending hunger"

Paper for the "Virtual Inter-agency Expert Group Meeting on Implementation of the Third United Nations Decade for the Eradication of Poverty"

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1. Introduction

The 'Third UN Decade for the Eradication of Poverty' aims at contributing to ending hunger and poverty by promoting collaboration across the United Nations system on policy issues requiring an integrated sustainable development approach. The actions under the Third Decade are complementary to those of other initiatives, such as the 'Decade of Action to Deliver on the Sustainable Development Goals' and the action areas evolving from the preparation of the 2021 United Nations Food Systems Summit.

Given that a majority of the extreme poor live in rural areas and that two-thirds of them derive a considerable part of their livelihood from agri-food-related activities, the question of how improvements in agricultural productivity can contribute to poverty reduction is pertinent for the actions under the Third Decade. This paper examines some of the linkages between agricultural productivity and ending poverty and hunger, as an input to discussions in the Expert Group Meeting on Implementation of the Third United Nations Decade for the Eradication of Poverty, to be held virtually from 24-27 May 2021.

The paper starts out with a review of key trends in challenges in poverty and hunger reduction. It introduces the concept of agricultural productivity and how this is measured, and reviews critical linkages between agricultural productivity and poverty. The paper argues that the contribution of an increase in agricultural productivity to poverty and hunger reduction needs to be assessed in the broader context of agricultural, rural and structural transformation. Conclusions drawn from global studies and stylized pathways need to be complemented by local-specific lessons and analysis.

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2. Key Trends in Poverty and Hunger Reduction

Setback in Poverty Reduction

Progress in poverty reduction has slowed in recent years and the socio-economic impact of the COVID-19 pandemic threatens to undermine gains made over the past decade. As of 2017, more than 689 million people were living in extreme poverty (using a USD 1.90 a day poverty line, World Bank, 2020). After nearly a quarter century of steady global decline in extreme poverty, the rates of decline have slowed and have suffered a serious setback as a result of COVID-19. From 1990 to 2015, poverty rates declined on average more than one percentage point per year, reducing the overall rate from 36.2% to 10.7 % in 2015. After 2015, however, decline reduced to less than half a percentage point per year, from 10.7 % in 2015 to 9.3 % in 2017. In 2020, the COVID-19 pandemic is estimated to have pushed an additional 119 to 124 million people into extreme poverty--a number which may rise to 163 million people by 2021[2] (World Bank, 2021 – data blog online).

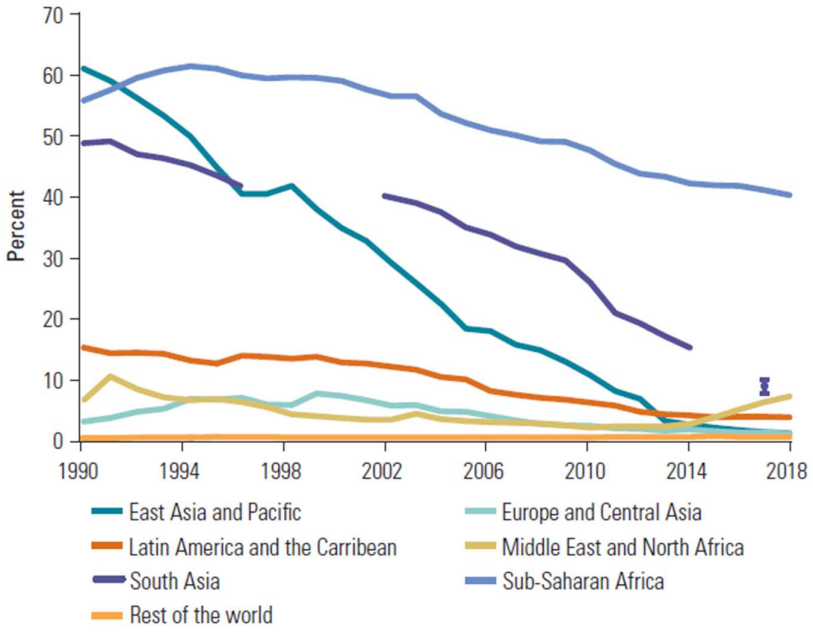
The picture of poverty further changes when instead of monetary poverty, measures of multidimensional poverty are included. Based on non-monetary deprivations – such as health, education and living standards – 1.3 out of 5.9 billion people across 107 developing countries, or 22 %, are estimated to be poor, using a multi-dimensional poverty indicator. It is important to note that multi-dimensional poverty trends do not match monetary poverty trends. This suggests that different drivers are at play, offering potentially important policy lessons (UNDP and OPHI 2020).

In terms of the rural-urban spectrum, the extreme poor remain overwhelmingly rural: 80% of the people below the international poverty line live in rural areas, although rural dwellers account for only 48% of the global population. In fact, poverty has become more rural over time. Between 2015 and 2018, the share of rural poor in the total population of poor people increased by more than 2 percentage points. Consequently, rural poverty continues to be strongly associated with employment in the agricultural sector; the incidence of extreme poverty is much higher among those employed in agriculture compared with those employed in other sectors (World Bank, 2020).

The majority of the global poor is very young. In 2018, children younger than 15 years accounted for half of the poor, even though this age group is only a quarter of the world's population. Children and youth (ages 15–24) together make up two-thirds of the global poor, while the cumulative population share of those aged 0–24 are 40 % of the total population. The high share of children and youth among the global poor is most evident in sub-Saharan Africa, but is visible across most regions. In high-income economies, however, the profile of poverty is skewed toward the elderly. Women are overrepresented among the poor globally and across most regions of the world (World Bank, 2020).

[2] https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-looking-back-2020-and-outlook-2021

Figure 1: Trends in Poverty Rates at the US$1.90-a-Day Poverty Line, by Region, 1990–2018



Source: Word Bank, 2020. Note: PovcalNet (online analysis tool), World Bank, Washington, DC, http://iresearch.worldbank.org. /PovcalNet/. Lined-up poverty estimates for South Asia are not reported for 1997–2001 and after 2014 because of a lack of population coverage (see box 1.2 on India and annex 1A in chapter 1 of this report). For South Asia in 2017, a range [7.7; 10.0] is reported.

There are also significant regional shifts in the number of poor across regions. In 1990, more than a billion of the extremely poor lived in China and India alone. Those economies have since grown faster than many of the richest countries in the world, thus contributing to a reduction of global inequality. The concentration of the world's poorest shifted from East Asia in the 1990s to South Asia in the following decade. More recently, the poverty hotspot has shifted to sub-Saharan Africa. Projections suggest the geographic concentration of extreme poverty is likely to continue. In 2030, 87% of the world's poorest are expected to live in sub-Saharan Africa, if economic growth follows the current trajectory (Roser and Ortiz-Ospina 2013 – updated 2019).

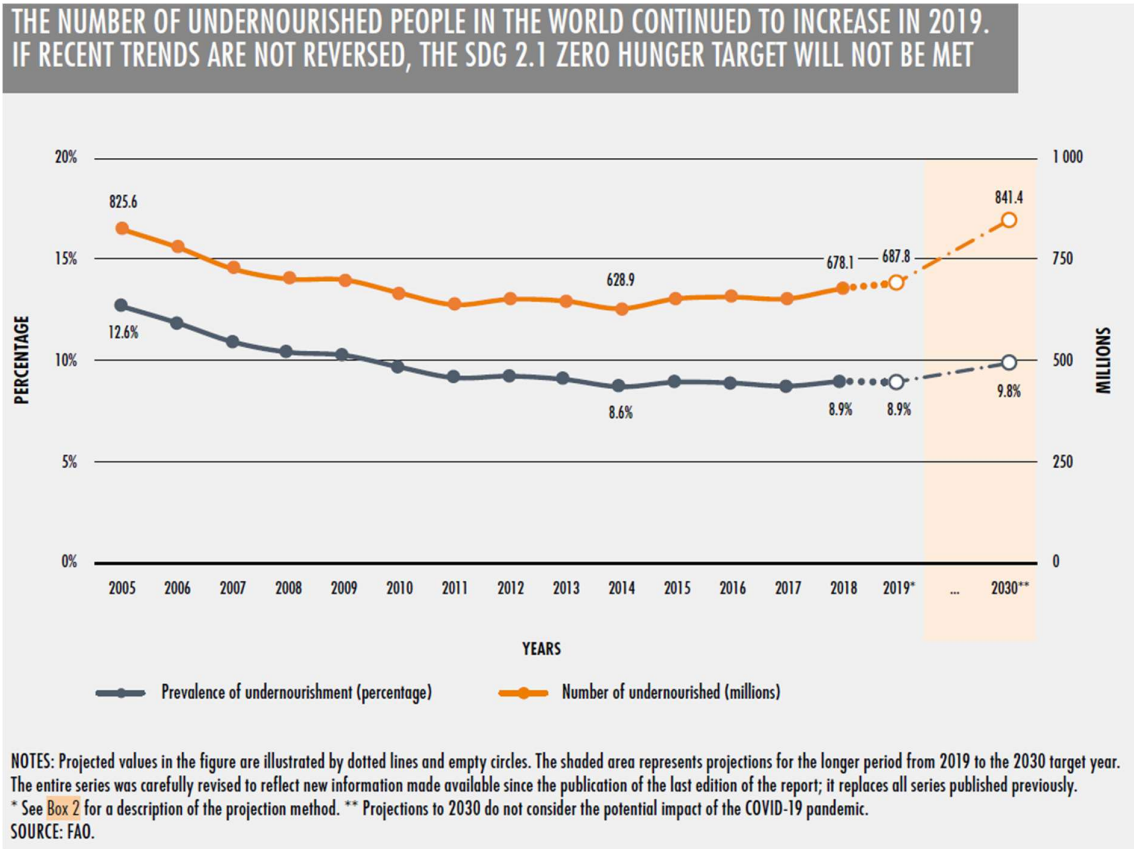
Undernourishment is on the rise and healthy diets are out of reach for the poor

The 2020 State of Food Security and Nutrition in the World Report[3] estimates that almost 690 million people, or 8.9 percent of the global population, were undernourished in 2019 - up by 10 million from 2018. This means that, similar to poverty, the reduction in the prevalence of hunger has slowed. The number of hungry people worldwide has been rising, in total, by 60 million people since 2014. The hungry are most numerous in Asia, but their number expands fastest in Africa. If recent trends continue, the number of people affected by hunger

[3] New data are expected in July 2021.

would surpass 840 million by 2030, making Africa the region with the highest number of undernourished by 2030 (FAO et al. 2020) (see Figures 2 and 3).

Figure 2: Trends in the Number and Prevalence of Undernourished People

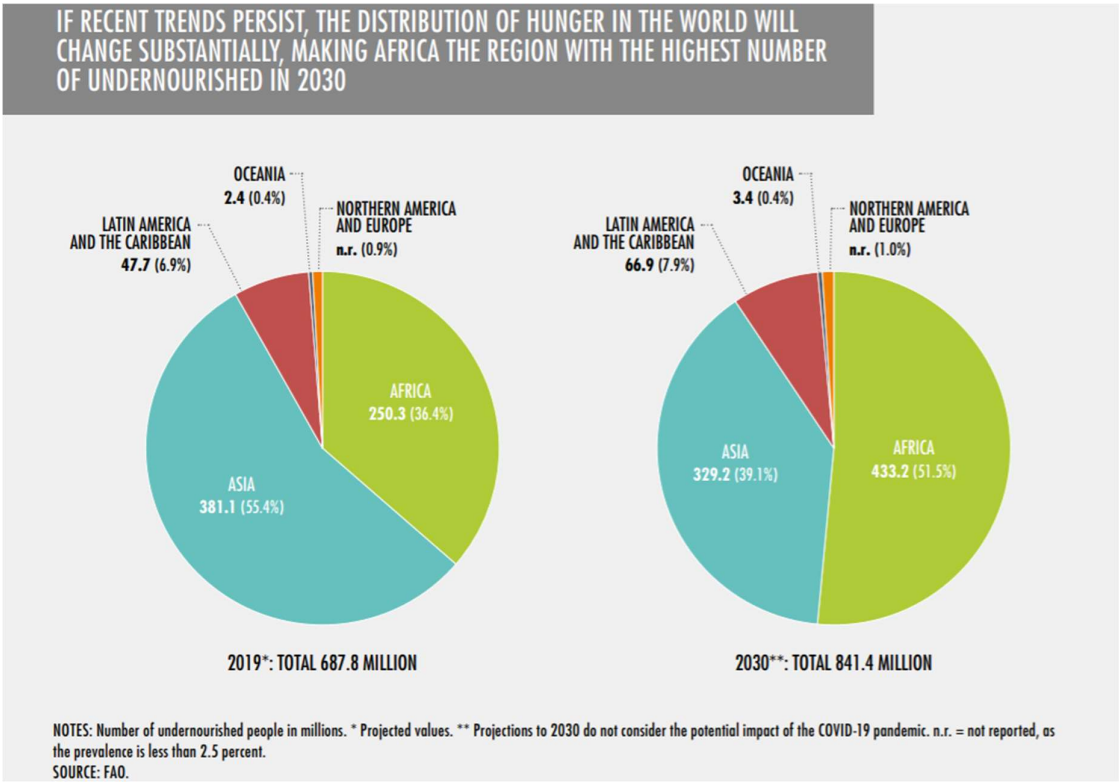


Source: FAO et al. 2020

Several factors contribute to the stagnation in hunger reduction, including conflict, climate variability and extremes, economic slowdowns and downturns. In addition, the COVID-19 pandemic could add between 83 and 132 million people to the total number of undernourished for 2020, depending on the underlying economic growth scenario, according to a preliminary assessment. An unprecedented Desert Locust outbreak in Eastern Africa has further dimmed food security prospects.

Food insecurity affects diet quality, including the quality of children's and women's diets, and people's health. Therefore, food insecurity also contributes to increasing the risk of child malnutrition, along with other determinants of nutritional outcomes. In 2019, 21.3 percent (144 million) of children under 5 years were estimated to be stunted, 6.9 percent (47 million) wasted and 5.6 percent (38.3 million) overweight, while at least 340 million children suffered from micronutrient deficiencies. The good news is that between 2000 and 2019, the global prevalence of child stunting declined by one-third. However, the world is not on track to achieve the global nutrition targets, including those on child stunting, wasting and overweight by 2030.

Figure 3: Distribution of Hunger across Regions



Source: FAO et al. 2020

A special chapter of the 2020 SOFI has examined the affordability of healthy diets. The report highlighted that the cost of a healthy diet exceeded the international poverty line (USD 1.90 purchasing power parity (PPP) per person per day), making healthy eating unaffordable for the poor. Considering that the cost of a healthy diet exceeded average food expenditures in most countries in the global south, the report estimated that about 3 billion people could not afford a healthy diet. This included 57% or more of the population of sub-Saharan Africa and Southern Asia. The report underscored that the cost of nutritious foods must come down to increase the affordability of healthy diets (FAO et al., 2020).

3. Agricultural Productivity, Poverty and Hunger Reduction

Measuring Agricultural Productivity

Productivity is defined as the ratio of outputs to inputs and is a measure of performance. Productivity indicators in agriculture are either partial (or single) factor productivity or multifactor (or total factor) productivity. Single-factor productivity measures the volume of output generated by a single input. Examples include labour productivity (such as the output per hour or day worked), land productivity (for example, output per planted area unit) or capital productivity (for example, output per machine horsepower) (FAO, 2018). Productivity can be measured at different scales (e. g. production unit, national level, etc).

Partial measures of productivity can be misleading, as they do not provide clear insights into why change occurs. For example, land or labour productivity may change because of mechanization, fertilizer use, or a change in the type of crops grown. To respond to some of

these problems, the Total Factor Productivity (TFP) was developed. TFP is the ratio of an index of outputs to an index of inputs, factoring all major factors of production and intermediate inputs.

TFP provides a measure of how efficiently factors of production are combined in the production process. TFP provides a complete picture of productivity. Often measured as a growth rate, TFP absolute levels cannot be easily interpreted when multiple outputs and inputs are considered and aggregated. TFP growth is the change in agricultural output that is not accounted for by the change in all or several agricultural inputs, namely land, capital, labour and intermediate inputs.

A reason why agricultural productivity is a subject of interest for policy-makers and analysts is that, through increased productivity, farms can better allocate scarce resources to other pursuits. At the macroeconomic level, the more efficient use of inputs and the reallocation of the surplus to other economic activities changes the sectoral contribution to national income. For example, an increase in labour productivity in the agricultural sector will allow part of the labour force to shift from the agricultural sector to other sectors of the economy, such as industry or services, which are generally characterized by higher productivity (FAO, 2018).

The link between agricultural productivity and the reduction of poverty and hunger

The role of agricultural productivity in poverty and hunger reduction has been the subject of political declarations and scientific discourse alike. For example, the Malabo Declaration (June 2014)[4] places agricultural productivity growth at the centre of Africa's objective to achieve agriculture-led growth and fulfil targets on food and nutrition security. It states that to end hunger in Africa by 2025, at least a doubling of agricultural productivity is necessary from 2014 levels.

Agricultural productivity measures are also embedded in SDG goals and targets. A link between farm productivity and incomes is explicit in SDG Target 2.3 which aims to "double, by 2030, the agricultural productivity and the incomes of small-scale food producers …" One of the two corresponding indicators is a productivity indicator, which measures the volume of production per labour unit by classes of farming population[5].

Debates and arguments among economists on the role or agricultural growth for poverty reduction abound. To give but one example, Pinstrup Andersen, 1995 provides the following four reasons to pursue agricultural growth in low-income countries:

- To meet growing food needs driven by population growth and urbanization
- To alleviate poverty through employment creation and income generation
- To stimulate overall economic growth, given that agriculture is a lead sector for many low income countries
- To conserve natural resources, often overused in the face of poverty

[4] The Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods (adopted during the 23rd Ordinary Session of the AU Assembly in Malabo, Equatorial Guinea, 26–27 June 2014).

[5] For metadata on this indicator see: https://unstats.un.org/sdgs/metadata/files/Metadata-02-03-01.pdf

Irz et al. (2001), examining the strength of economic determinants at farm, rural and national economy level across a section of countries, concluded that the effects of these determinants on poverty reduction were remarkable. They also stressed that the potential of agricultural growth to reduce rural poverty depended on specific circumstances.

Mwabu, (2016), identified the following factors that come into play in determining the poverty reduction potential of agriculture in Africa:

- The relative size of population in rural areas or agriculture
- The reasons for low-factor productivity in African agriculture
- Productivity in non-agricultural occupations
- The increasing responsiveness of rural poverty to agricultural productivity
- The size of smallholder sector relative to large-scale farms

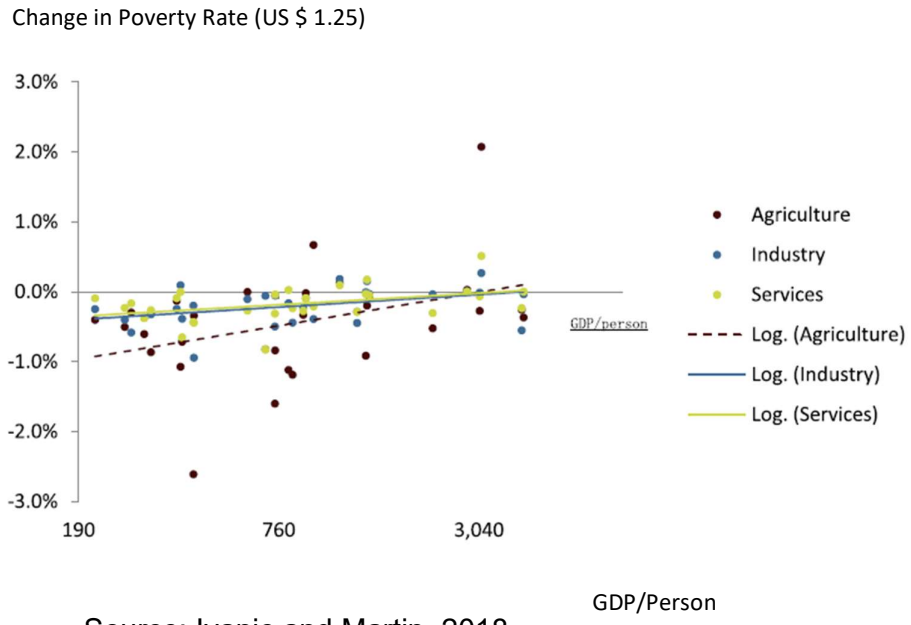
In aggregate terms, the poverty-reducing effect of agricultural productivity growth compared to other sectors is widely documented. For example, Ivanic and Martin, 2018 found that, in poor countries, an increase in agricultural productivity has nearly twice the impact on reducing extreme poverty as a comparable productivity increase in industry or services. The World Bank estimates that agricultural productivity growth could, be two to four times as effective as that in other sectors[6].

Figure 4 shows the relationship between per capita GDP and poverty change, with the x-axis representing GDP per capita and the y-axis the change in the poverty rate resulting from productivity change equal to 1% of GDP for different sectors. The figure shows that the importance of productivity increases in agriculture for poverty reduction generally exceed those for industry and services, especially at lower income levels. This means that increasing GDP by identical amounts through increasing productivity in different sectors would lower poverty most, if the productivity gain is in agriculture (Ivanic and Martin, 2021).

Figure 4 also shows that poverty reduction effect of productivity growth declines with rising per-capita incomes, regardless of which sector experiences the improvement in productivity. The differential between agriculture and other sectors also declines as average incomes rise, partly because agriculture becomes smaller as a share of the economy and partly because agricultural productivity growth becomes less effective in reducing poverty. The source of the poverty-reduction benefits from agricultural productivity growth changes as innovations are more widely adopted—moving from increases in producer returns to reductions in consumer prices (Ivanic and Martin, 2018).

[6] See: https://www.worldbank.org/en/topic/agriculture/overview

Figure 4: The Poverty-Reducing Effects of Agricultural Productivity Growth



Source: Ivanic and Martin, 2018

Trends in agricultural production and productivity

An analysis of trends in agricultural productivity can be useful to derive key issues and challenges for poverty reduction. In terms of physical measures, FAO, in an analysis of trends and challenges for the future of food and agriculture (FAO, 2017a), highlights that from 1960 to 2015; agricultural production more than tripled, owing in part to productivity-enhancing Green Revolution technologies and a significant expansion in the use of land, water and other natural resources for agricultural purposes.

The report, however, cautioned that yield increases were slowing, despite overall improvements in agricultural efficiency. It also highlighted that some of the technologies that underpinned the Green Revolution led to adverse effects for agriculture's natural resource base, including land degradation, salinization of irrigated areas, over-extraction of groundwater, the build-up of pest resistance and the erosion of biodiversity. This implies that the technologies for triggering productivity growth may need to undergo profound transformation.

Labour productivity in agriculture, shown in Figure 5, is another partial productivity indicator used for global comparisons. The map shows country estimates of the value added per agricultural worker and illustrates the wide diversity across countries, with most countries in Africa showing the comparatively low values in agricultural value added per worker. While sometimes referred to as an indicator relevant to poverty reduction, in country distribution of value added is not captured by this indicator.

Figure 5: Map of Agricultural Value Added per Worker

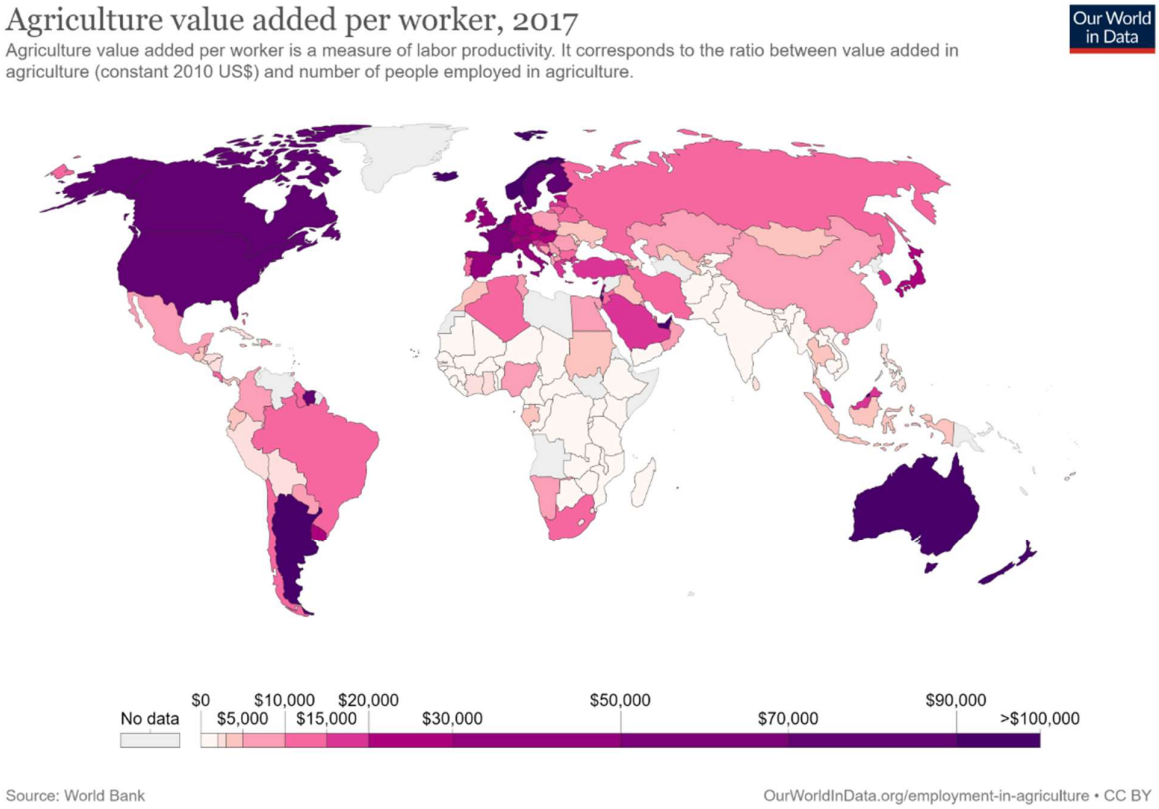
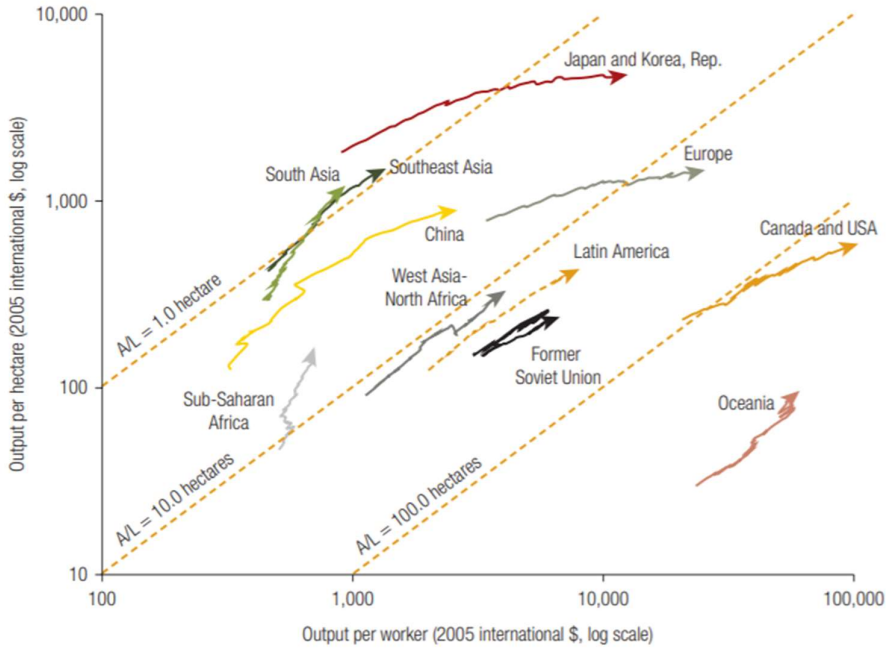


Figure 6 demonstrates the evolution of aggregate agricultural productivity from 1961 to 2015 (logarithmic scale), depicting output per hectare of land (vertical axis) and output per worker (horizontal axis) in monetary values. The lines show the progress that each region has made in terms of these two measures over a more than 50 year period. Sub-saharan Africa and South Asia have moved comparatively little with regard to both of these indicators. South-east Asia has moved somewhat faster than Africa. China has moved from levels close to those of Africa in the 1960's to values close to Latin America in 2015. It is important to note, however, that the values shown may overstate the gains per worker as they include the contribution from a more intensive use of agricultural inputs, such as mechanization, fertilizers, and irrigation -- all of which come at a cost.

Figure 6: Fifty-Year Trends in Agricultural Land and Labor Productivity Reveal the Large Divergence in Regions and Countries, 1961–2015

Agricultural Land and Labor Productivity by Region



Source: Derived from FAO (2018a) data.

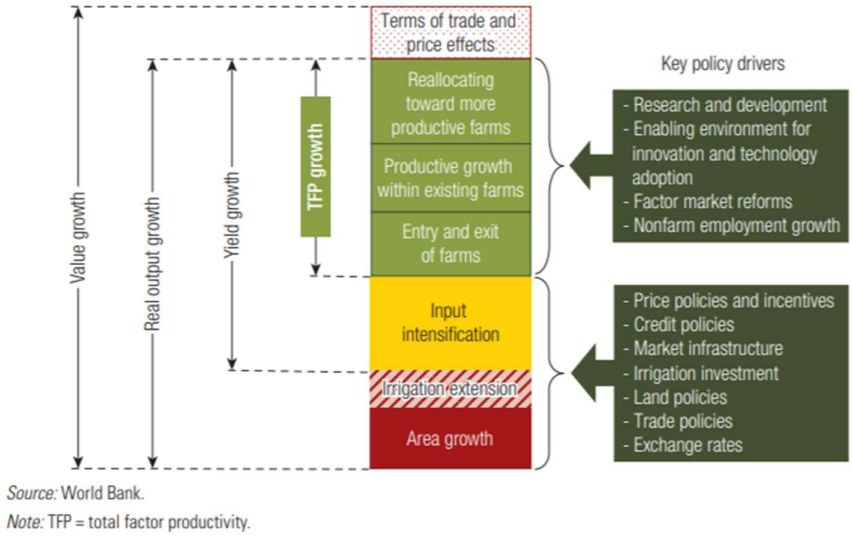
Note: The diagonal lines represent constant land-labor (A/L) ratios.

Source: Fuglie et al. 2020

The partial productivity measures illustrated above allow only limited insight into the wide range of factors underpinning agricultural growth. Decomposing agricultural growth helps determine how much of the growth originates from area growth, input intensification, extension of irrigation, price effects, changing terms of trade and TFP growth, which is shown schematically in Figure 7.

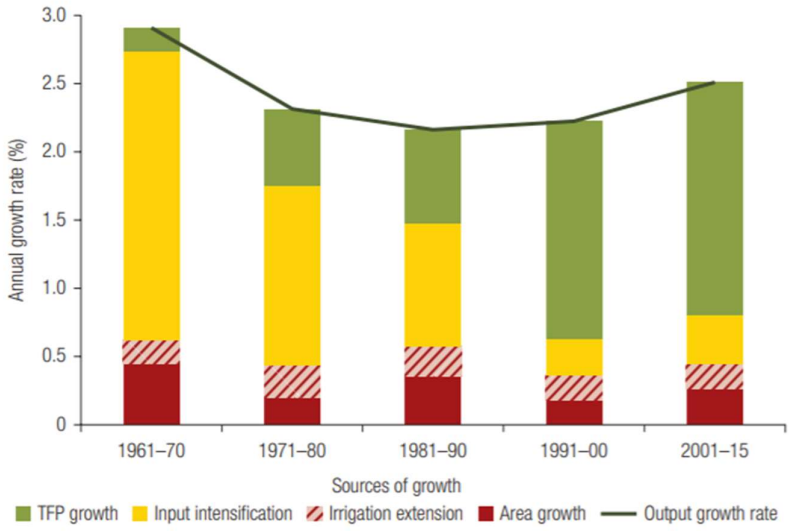
As mentioned above, TFP refers to increases in agricultural output owing to an overall increase of efficiency of production processes, rather than through the intensification of input use. Key policy drivers for boosting TFP growth include research and development, creating and enabling environment for innovation and technology, factor market reforms, and creating off-farm employment (Fuglie et al. 2020).

Figure 7: Decomposing Agricultural Economic Growth



Source: Fuglie et al. 2020

Figure 8: Increases in Total Factor Productivity have become an Increasingly Important Source of Global Agricultural Growth



Source: Fuglie et al. 2020

Applying the concept outlined in Figure 7 to data from international agricultural productivity accounts of USDA-ERS[7] provides some insights into the composition of global agricultural

[7] US Department of Agriculture Economic Research Service

growth from 1961 to 2015, as shown in Figure 8. Across the various periods, the contribution of TFP to output growth has steadily increased. Over the entire period from 1961 to 2015, TFP accounted for 44% of additional output. In the final period 2001 to 2015 (see last column of figure 7), TFP contributed two-thirds of agricultural productivity growth, and has thus been the major driver of output growth.

An important point to note is that the market-based TFP does not consider the social costs of externalities, such as greenhouse gas emissions, reduced biodiversity, or degradation of land and water quality. If this increases the use of potentially underpriced resources, the measured rate of TFP growth would be overstating the true gain in production efficiency (Source: Fuglie et al. 2020)

Fuglie et al. also analyse some of the differences across countries and note that the acceleration in TFP growth in developing countries has been geographically very uneven. Emerging economies like Brazil and China sustained agricultural TFP growth of over 2% per year over this period, while most countries in sub-Saharan Africa achieved TFP growth rates of less than 1% per year.

In conclusion, this section highlighted a few examples of trends in agricultural productivity. In terms of physical productivity measures, the yield growth/area of land has slowed in the past decade, which raises concern about whether the production gains achieved in the past can be sustained in the future. In terms of value of output per agricultural worker, an indicator that usually rises with countries' GDP, many African countries still show very low values, particularly where poverty and hunger rates are high.

A global analysis of total factor productivity has shown that TFP has become the main driver of agricultural productivity growth. Policies that foster increases in TFP include research and development, creating an enabling environment for innovation and technology, factoring market reforms, and creating off-farm employment.

An analysis of global trends is useful for helping to shape sectoral policies. However, global productivity measures are not sufficient to draw well-grounded policy recommendations for poverty and hunger reduction, given the limited coverage of externalities and a lack of insight into distributional patterns and the limited availability of data.

Nevertheless, a review of productivity trends raises important questions. How can the availability and quality of data on labour in agriculture and the broader food systems be improved? What options emerge for those employed in agriculture during the growth process as labour is being withdrawn? How will new technologies affect the relationship between land and farm size and productivity? Many of these questions require addressing agricultural productivity in the broader context of rural and structural transformation.

Agricultural Productivity and Rural and Structural Transformation

The effect of agricultural productivity growth on poverty needs to be assessed in the broader context of agricultural, rural and structural transformation. Figure 9 illustrates a stylized set of processes, placing agricultural transformation in the center of a path, from building assets to structural transformation of the whole economy.

Figure 9: The Agricultural Modernisation Sequence

Stages of transformation	Processes
Asset building	Access to land and human capital for the landless and SHF
Green Revolution	Adoption/diffusion of new seeds and fertilizers for staple crops
Agricultural Transformation	Access to water for irrigation Ag diversification toward high value crops Development of value chains and contracting
Rural Transformation	Mechanization and land concentration Development of land and labor markets Growth of the rural non-farm economy
Structural Transformation	Rural-urban migration Urban-based industrialization and services

Source: De Janvry, Alain and Elisabeth Sadoulet. 2019

Focusing on how best to leverage food systems for inclusive rural transformation, FAO demonstrates how economic growth in rural areas has helped millions escape poverty, and illustrates approaches for inclusive rural transformation. The report describes 'inclusive rural transformation as 'a process in which growth in rural areas, whether it occurs on- or off-farm, benefits all of the rural population, especially the poor' (FAO, 2017b).

IFAD's 2016 Rural Poverty Report stresses that rural transformation does not happen in isolation, but as part of a broader process of structural transformation shaped by the interlinkages between agriculture, the rural non-farm economy, manufacturing and services. The IFAD report stresses that rural transformation is essential for structural transformation. It cautions, however, that while necessary, rapid rural or structural transformation do not automatically lead to a rapid reduction in rural poverty (IFAD, 2016)

FAO's framework on rural extreme poverty describes the patterns and requirements for how rural poverty decreases in the transformation process. Poverty tends to decrease as countries go through the process of structural transformation. This happens as agricultural productivity increases, the relative share of agriculture in GDP and overall employment declines, the development of modern industrial and service sectors strives, and countries undergo a demographic transition from high to low birth and death rates (FAO, 2019).

Structural transformation, agricultural and rural transformation are intrinsically linked, involving a shift from primarily subsistence farming to market-oriented and diversified production systems, and the emergence of the rural non-farm sector. Although agriculture's relative share in the economy and employment declines during this transformation, it remains an important source of economic growth, employment and income generation, as well as a safety net for food security for many rural households during the process.

Low-income countries are usually at the early stages of structural transformation: their economies are mostly agricultural with low levels of productivity, which hampers the development of other sectors. In lower middle-income countries, where structural transformation is ongoing, the challenges pertain to the economic exclusion of those left behind. For example, structural transformation appears to have been more inclusive in

Southeast Asia than in Latin America, because of more equitable resource distribution, including land (FAO, 2019).

While growth in agriculture has a greater impact on poverty reduction compared to other sectors, its magnitude depends on the structure of country economies and institutional arrangements. Agricultural growth does not automatically benefit the poor, particularly in countries with greater inequalities in access to resources, such as land, inputs, and irrigation. Addressing gender and structural inequalities in access to resources is critical for effective poverty reduction. Recent research indicates that significant gains may be achieved through investments in the generation and diffusion of knowledge, while gains from reallocating land and labor may be smaller than previously thought (Fuglie, 2020).

For structural transformation to accelerate poverty reduction, appropriate economic and agricultural policies, including monetary and trade policies, are needed. These determine investment and growth patterns, which in turn affect employment generation in rural areas, the quality of jobs, and the level of inclusiveness of the growth process. Investments also need to cover basic services, infrastructure, health and education, in addition to primarily growth-focused aspects.

Eradicating rural extreme poverty may also requires the implementation of dedicated and integrated interventions that explicitly target the extreme poor, providing sustained support to increase their participation in society and their potential, to benefit from overall economic growth. Investing in the expansion of rural social protection systems helps support the ability of the rural extreme poor to manage risks, weather the seasonality of agriculture, and diversify income-generating strategies.

Social protection also stimulates investment in agricultural production and other economic activities. It enhances nutrition, health and education, with implications for future productivity, employability, incomes and well-being. Social protection programmes that provide regular and predictable transfers promote savings and investment in both farm and non-farm activities, and encourage households to engage in more ambitious activities offering higher returns.

During the transition process, rural-urban linkages tend to strengthen in terms of production, markets and labour mobility, while secondary and peri-urban cities emerge (FAO, 2019). Small towns and cities play a fundamental role in the diversification of rural incomes. They also are a major factor in shaping the local food market the off-farm sector (FAO, 2017a). A notable modern-day example of how agricultural productivity facilitated labour migration to cities is China, which saw massive migration from rural areas to cities, as well as significant “in-situ urbanization”, the transformation of previously rural settlements into urban-industrial and service-intensive localities (United Nations, 2020).

When analyzing the potential of structural change for employment creation, Rodni, 2012 concluded that not all forms of productivity growth and structural change lead to higher growth and employment rates. Drawing on data from developing countries, he argued that only the “right” kind of productivity growth resulted in higher employment rates. He observed that in Asia, labour shifted from the less productive agricultural sector to more productive sectors, while in Africa and Latin America, labour switched from a relatively productive agricultural sector to even less productive informal sectors. Thus, policies have to focus on shaping productivity growth and structural change, avoiding over-valuation of local currencies and protecting local infant industries (Rodni, 2012).

To develop sound policies, mobilize investments and formulate integrated programmes that shape agricultural, rural and structural transformation while also contributing the rural poverty reduction, countries also need to generate regular, reliable and transparent

statistics, as well as information systems that help direct support to the extreme poor. They also need to step up research, participatory assessments and impact evaluation.

The linkages between poverty reduction and food security – a micro-level perspective

The introductory section to this paper focused on trends in hunger and poverty, and showed commonalities. These include: poverty as a key factor in determining access to food; comparable numbers of people being subjected to poverty and to hunger; slowing trends in the decline of both poverty and hunger rates; and a shift of the hotspots for hunger and poverty from Asia to Africa. However, does that imply that poverty and hunger are two sides of the same coin?

Gassner et al, 2019, argue that hunger and poverty are inextricably linked. Nevertheless, they are two distinct concepts that require distinct alleviation measures. Food security is about access to safe and nutritious food all year round, while poverty, in its multidimensional expression, is a deprivation in relation to health, education and standard of living. The examination of both phenomena through the lens of agricultural development leads to distinct strategies and target groups for interventions and policies.

Interventions that target the smallholder sector need be cognizant that farm-level technologies that are effective for improving food security are not necessarily effective for reducing poverty or vice versa. Narratives that consider smallholders as a uniform group that acts as an agent of change for rural transformation may be problematic. Gassner et. al, based on Dorward, 2009, distinguish three strategies through which household pursue livelihood strategies with respect to agriculture:

- Households that have limited livelihood options other than agriculture, but for which agriculture acts largely as a safety net, may pursue agriculture without much prospect of growth
- Households that generate sufficient surplus to reinvest and expand may have great potential to participate in agri-food value chains and benefit from growth; and
- Households that are successful in moving into higher paid non-farm sectors may benefit from leaving the sector

A general review on the role of agricultural productivity for reducing poverty and hunger may conceal this important differentiation, with far-reaching policy implications. It calls for policy makers to differentiate between food security and income/economic growth challenges and to consider the implication of policies for agri-food systems transformation for different segments of the population.

Inclusive value chains as an entry point for agricultural productivity growth and poverty reduction

In order to harness the poverty reducing potential of agriculture, enhancing smallholder participation in agri-food value chains has emerged as a market-based strategy. Value chains are a way to enhance farmers' access to markets, inputs and credit, thereby improving efficiency and productivity for improved livelihoods, food security, climate resilience and gender equality (Ros-Tonen et al., 2019).

Up to 90% of food consumption in rural areas of low-income countries comes from domestic sources (FAO 2017). Growth in agriculture and related value chains can be an important source of income growth and job creation in both rural and urban areas. Formal, structured

supply chains increase the efficiency of product flows – from inputs to farmers, and food products to consumers. They can improve access to more and better-quality food, raise farm incomes and generate employment in both agricultural and non-agricultural sectors.

Furthermore, global value chains (GVC) can be a significant avenue to growth by building on the effects of international trade for growth, harnessing technology and knowledge spillovers that can increase productivity, improve employment opportunities and raise incomes. Empirical estimates using data on the GVC participation of 160 countries between 1995 and 2015 suggest a causal relationship between GVC participation and agricultural value added per worker. The report concludes that a 10% increase in agriculture's GVC participation can result in an increase of around 1.2% in labour productivity (FAO 2020).

Productivity increases, in conjunction with more trade and competition, bring about increases in the availability of safe and nutritious food and drive prices down, resulting in improvements in access to food. For many people, this process results in improved food security and a better diet, since it increases access to foods rich in micronutrients such as fruits, vegetables and animal-sourced foods.

However, the rise of urban lifestyles, and the associated transformations in food production and food value chains are perceived by some analysts as contributing factors in the shift towards less healthy diets, and in the increasing prevalence of overweight and obesity in many parts of the world. In many low- and middle-income countries, overweight and obesity coexist with undernourishment and micronutrient deficiencies, described as the "triple burden" of malnutrition (FAO 2017a).

While globalizing markets offer opportunities for marketing higher-value products, these markets generally demand considerably more in terms of business skills, efficiency, and attention to quality and food-safety standards than markets for traditional products. They require smallholders to deliver regular supplies of produce of consistent quality and sufficient quantity. Meeting these conditions requires access to land, inputs, technology, knowledge, organization, capacity, skill, and infrastructure, which may not exist in some communities or among some groups of asset-poor producers (Horton et. al., 2009)

In conclusion, knowledge of the poverty impacts of value chain development is on-going. There is a need to step up poverty impact evaluation of value chain development as an opportunity to embrace the complex needs and realities of the rural poor. This includes better assessing the "value chain readiness" of smallholders, determining what type of asset endowment fosters effective participation, and further shaping the role of public, private and civil society actors in value chain development (Stoinan et al. 2012).

4. Main challenges

Based on a literature review of global trends and progress related to increasing agricultural productivity and ending poverty and hunger, this paper draws out the following challenges and implications for policy:

1. The world is experiencing major setbacks in hunger and poverty reduction. Globally, the number of undernourished people has been rising in absolute terms since 2014. Further, the socio-economic impact of COVID-19 threatens to **erase progress made over the past decade**. Given that 80% of the world's poor live in rural areas, and many depend on farming for their livelihood, agriculture and food systems play a key role in making progress on poverty and hunger reduction. The upcoming UN Food Systems Summit provides an important platform to accelerate progress towards the

SDGs by generating game changing proposals and commitments for transforming **agri-food systems and raising agricultural productivity in sustainable manner**.

2. There is ample evidence that agriculture can contribute to poverty reduction beyond a direct effect on farmer incomes. **Agricultural productivity growth has been shown to be more poverty-reducing than growth in other sectors**, in particular in low-income countries where agriculture constitutes a major portion of the economy and absorbs a large part of the labour force. Increased productivity of agriculture raises farm incomes, increases food supply, reduces food prices, and provides greater employment opportunities in both rural and urban areas. However, fully harnessing this potential for poverty reduction is premised on a range of pre-conditions and requires targeted policies and investments.

3. In terms of land, labour and total factor productivity, recent decades have brought profound transformation and growth in agriculture, and rural transformation has lifted millions out of poverty. **However, pathways and achievements differ widely across regions and countries**. Rising productivity in China and other countries of East Asia has contributed to impressive reductions in poverty. Yet, in some of the poorest regions, i.e. South Asia and sub-Saharan Africa, productivity growth has remained low.

4. Paradigms for raising agricultural productivity in the future based on intensification and expansion of land use are constrained by climate change, as well as the externalities that intensive modes of production bring for biodiversity, soil, water and air. **Approaches that may have led to productivity gains in the past may not be replicable in the same way** in the future. Smart innovation is key to increasing efficiency and productivity in socially and ecologically sustainable ways. Recent research indicates that substantial gains may be achieved through investments in the generation and diffusion of knowledge. Conversely, gains from reallocating land and labor may be smaller than previously thought.

5. To harness the potential contribution of agricultural innovation and productivity growth for poverty and hunger reduction, **policies and investment need to be conceived within the broader framework of agricultural, rural and structural transformation.** Poverty reduction requires investment in infrastructure and quality services, as well as an enabling environment for employment, income and equitable access to natural resources. Social protection coverage needs to be expanded to rural areas and embedded in policy and legal frameworks to ensure sustainability. Combining social protection instruments with livelihood interventions and access to finance can help promote the economic inclusion of the rural poor.

6. Initiatives aimed at boosting agricultural productivity in the context of rural transformation need to consider the opportunities provided by stronger **rural-urban linkages.** In addition to global and national economic drivers, local social, institutional and agro-ecological conditions influence the movement of people, goods, services, financial resources and environmental services between rural and urban areas and influence the outcomes of rural transformation. Leveraging these rural-urban linkages for inclusive rural transformation and effective poverty reduction requires territorial, location-specific approaches.

7. Research, participatory assessments and impact evaluation using reliable and transparent **statistics and information systems** are needed to develop sound policies, mobilize investments and formulate integrated programmes for poverty-

focused agricultural, rural and structural transformation and provide support to the extreme poor.

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Annex 1: Principles of the implementation of the Third UN Decade for the Eradication of Poverty

The plan of action is founded on 10 basic principles that will guide the work of the United Nations:

- Poverty is multi-dimensional in the forms it takes and its underlying causes, and new forms are emerging;
- Integrated economic, social and environmental policies are needed nationally and internationally;
- Sustained and inclusive economic growth that narrows inequalities is necessary and entails structural transformation to generate full and productive employment and decent work for all;
- Respect for internationally recognized human rights is an essential foundation for action;

- Gender mainstreaming is vital for policy design and implementation;
- Discrimination, marginalization and exclusion are major causes of poverty and the barriers to the full participation in society and the economy of poor people and people in vulnerable situations, and must be removed;
- Inclusion and empowerment of those left behind is a priority, targeting those furthest behind;
- The role of the United Nations is to support nationally owned strategies and strengthen capacities for the realization of internationally agreed development goals and targets, including the Sustainable Development Goals, based on high quality research and the promotion of good governance, human rights and the rule of law;
- The United Nations development system organizations will bring together their special expertise and policy portfolios to focus on integrated system-wide action that enhances efficiency, coherence, impact and adaptability to emerging trends;
- Inclusive and strategic partnerships based on these principles will pull together resources and deliver action globally, regionally, nationally and locally.

Source: https://www.un.org/development/desa/socialperspectiveondevelopment/united-nations-decade-for-the-eradication-of-poverty/swap3rd.html

Annex 2: Pillars of the System-wide Action Plan of the Third UN Decade for the Eradication of Poverty

While the System-wide Action Plan for the Decade has a special section on the future of food and sustainable agriculture, the contributions of improvement in agriculture and agriculture productivity contribute to poverty reduction across all the seven pillars of the SWAP.

- Structural Transformation, Productive Employment and Decent Work in the Context of a Changing Global Scenario
- Expanding Social Protection Systems to Underpin Inclusive Poverty-Reducing Development
- Human Capability Development: Addressing the Non-Income Forms of Poverty
- The Future of Food and Sustainable Agriculture
- Reducing Inequalities
- Addressing Climate Change and the Intensification of Natural Hazards
- Fighting Poverty in Fragile and Humanitarian Contexts