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## Eradicating extreme poverty: What is the role of agriculture?

### Introduction

This document summarizes the online discussion *Eradicating extreme poverty: What is the role of agriculture?* which was held on the FAO Global Forum on Food Security and Nutrition (FSN Forum) from 3 to 24 April 2018. The discussion was facilitated by Ana Paula de la O Campos and Maya Takagi of FAO.

This online discussion was part of a broader reflection on the part of FAO towards refining and improving its approach to the eradication of extreme poverty, by using its experience in supporting the development of agriculture and the livelihoods of rural dwellers towards the realization of SDG1.

Over the three weeks of discussion, participants from 42 countries shared 110 contributions. The topic introduction and the questions proposed, as well as the contributions received, are available on the discussion page: [www.fao.org/fsnforum/activities/discussions/extreme\\_poverty\\_agriculture](http://www.fao.org/fsnforum/activities/discussions/extreme_poverty_agriculture)

### Conditions under which agriculture can succeed in lifting people out of extreme poverty

Given that many of the world's extreme poor live in rural areas and are dependent on agriculture for their livelihood, the agricultural sector plays an important role in eradicating extreme poverty. But agriculture alone is not enough; an integrated and multisectoral approach needs to be adopted which takes into account context specificities (Joseph George Ray, Manuel Castrillo, Shahid Zia, Rajendran TP, Wajid Pirzada, Costas Apostolides, Lena Acolatse) and promotes an enabling environment for agricultural development.

Moreover, the region or country must be conflict-free (Mylene Rodríguez Leyton, John Ede, Ikenna Ejiba, Kamaludin Abdullahi) and its rural areas must have basic services (such as health services), opportunities for education, and decent

housing and living conditions (Mylene Rodríguez Leyton, Joël Zongo, Mou Rani Sarker, Stephen Dania).

Strengthening local agriculture and food systems is necessary to enhance agricultural productivity and eradicate poverty (Kamaludin Abdullahi, Malika Bounfour). But there needs to be growth in other sectors as well; moreover, primary, secondary and tertiary industries should be integrated, in particular in order to extend agricultural value chains (Yubo Xu, Wajid Pirzada). This is especially important given that agriculture cannot always ensure year-round employment (Rejaul Karim). Enhanced engagement of smallholders in value chain development has the potential to improve their living standards (Mou Rani Sarker).

## Creating an enabling environment for agricultural development

Participants shared a wide range of specific suggestions on what is needed to boost agricultural development. First, the extent to which people depend on agriculture for their livelihoods, as well as its importance for food and nutrition security, should be recognized when it comes to budgetary allocations. Public-private partnerships should also be formed, as they allow for more equal risk sharing while also turning tradeoffs into trade benefits (Jodean Remengesau).

National agriculture- and food security-related strategies should fully engage smallholders in their design and implementation (Olutosin Otegunrin) and take into account gender considerations as well (Bulent Gulcubuk). In addition, there should be a new focus on environmentally sustainable agriculture (Mahtab S. Bamji), strengthened agriculture-nutrition linkages (Mahtab S. Bamji, Rabi Auwalu Yakasai, Deepak Sharma), and quality rather than quantity (Joseph George Ray).

In particular, participants discussed the following themes and possible interventions in the agricultural sector:

- ▶ **Inputs.** Farmers' access to inputs can be improved by means of subsidies (Peterson Kato Kikomeko, Mahtab S. Bamji, Kamaludin Abdullahi) or by training them to prepare their own inputs (Rauben Kazungu); seed and fodder banks can also help with the cost of inputs (Mithare Prasad). Inputs should be of high quality to ensure increased agricultural productivity (Peterson Kato Kikomeko, Rutger Groot), and there should be adequate regulations to guarantee input quality (Peterson Kato Kikomeko).
- ▶ **Credit.** Smallholders can only avoid debt traps if governments provide timely credit at notional interest rates (Rajendran TP). Microfinance has increasingly proven

to be an effective and sustainable means of providing credit to the poorest (Lindsay Campbell). When they have access to small capital investment, the poorest can then use modern agricultural technologies to enhance their agricultural productivity (Getaneh Gobezie, Joseph George Ray). National authorities should bring microfinance institutions and banks closer to the farming population, and administrative procedures should be simplified in order to facilitate access to these institutions' services (Herbert Iko Afe).

- ▶ **Extension services.** There exists an information gap among farmers with regard to efficient farming methods (Nazrul Islam). Especially for those households with limited access to productive resources, access to agricultural innovations (Stephen Dania, Malika Bounfour, Andrew Isingoma, Peterson Kato Kikomeko) via an extension system is vital. Capacity development combined with a system for delivering technology packages can help alleviate poverty (Lindsay Campbell), while good training allows smallholders to become true rural entrepreneurs (Rutger Groot). Current agricultural extension programmes should be reviewed to ensure that they contribute to poverty eradication. Moreover, a comprehensive policy must be established whereby both food security and conservation objectives are enshrined within extension service delivery. For example, extension services should encourage communities to institutionalize local mechanisms to protect natural resources. Regarding the approach to extension, the current top-down model should be converted into a knowledge sharing and facilitated learning approach, with extension agents regarded as partners. Farmers should be provided with knowledge they can use, in particular independent information covering modern as well as traditional ways of farming (Marc van der Sterren). While ICTs can play an important role in technology delivery (Mohammad Abdul Mazid) – for instance YouTube videos could provide information and guidance on context-specific agricultural options (Paul Rigterink) – the importance of human interaction in extension was also stressed (Mahtab S. Bamji, Thatchinamoorthy C.), something which cannot be substituted by ICT tools (Thatchinamoorthy C.). Finally, there should be a mechanism for the continuous education of extension workers, allowing them to update their knowledge and skills (Mahtab S. Bamji).
- ▶ **Market access.** Many participants pointed out the need to create market linkages at local as well as international levels; the particular focus should however be on local market development (Florence Egal, Malika Bounfour).



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Public procurement, with reasonable prices, can for instance promote production increases (Stephen Dania) and should guarantee the sales of farming products even before their production (Herbert Iko Afe).

- ▶ **Agricultural prices and marketing.** Extreme poverty cannot be eradicated without instruments to help mitigate market price fluctuations, such as subsidies for producers (Adebayo Depo). Another issue of concern is that of intermediaries, who profit off farmers by offering them lower prices (Joseph George Ray, Adebayo Depo, Joseph Bagyaraj). There need to be policies to ensure better prices for farmers, for instance through cooperative stores where farmers can deliver their goods directly (Joseph Bagyaraj). Another way to increase farmers' incomes is by registering brand names for (processed) agricultural products in order to facilitate market penetration (Costas Apostolides).
- ▶ **Infrastructure.** Access to irrigation infrastructure, such as roads, storage and transportation facilities (Stephen Dania, Donna Rosa, Andrew Isingoma, Joseph George Ray, Stephen Dania) should be realized, with priority given to cold chain and food processing (Mahtab S. Bamji).
- ▶ **Crop insurance.** There are multiple benefits from crop insurance that can ultimately improve production, such as income stability, minimized debts, and technological advances introduced through partnerships with insurers (Agape Ishabakaki, Mahtab S. Bamji).

- ▶ **Equipment.** The lack of adequate and relevant equipment hampers agricultural production levels (Nazrul Islam, Lal Manavado). Access to basic, affordable agricultural equipment is needed to improve efficiency (Donna Rosa).
- ▶ **Farmer cooperatives.** Households with limited access to productive resources can join together in associations or cooperatives. These allow them to collectively set up tontines, request credit (Herbert Iko Afe, Joseph George Ray) and push for fairer market prices (David Odili). Furthermore, when farmers are organized, they are also easier to reach in terms of extension and information sharing (Andrew Isingoma).
- ▶ **Labour unions.** For agricultural labourers who lack access to productive resources, unions provide them with increased bargaining power to demand higher wages (David Odili).

However, in order for agricultural productivity to increase, social protection must be a precondition. For agricultural businesses to succeed, farmers not only need investment, but also a social safety net for when they fall on hard times. Evidence from Africa suggests that cash transfers lead to increased production and farming investment, and can provide a much-needed boost to farmers' productivity (de Volkskrant article shared by Frank van Kesteren). In this context, there needs to be better understanding among those involved in policy-making and implementation on the two-way relationship between social protection and agriculture (Edward Tanyima).

## Farming approaches and practices in the fight against poverty

Participants shared various methods of farming which could play a role in the eradication of extreme poverty. *Contract farming* (Rutger Groot) can enhance access to markets, information, credits and risk-management services, and eventually raise smallholders' income (Taibat Moji Yusuf). *Family farming* allows farmers to feed their families throughout the whole year (Mithare Prasad, Bulent Gulcubuk). Indeed, the first priority of farming should be to ensure food security and nutrition for families, rather than to generate income (Deepak Sharma).

Yet another farming type, *home gardening*, can play a vital role in dietary improvement and income enhancement among the extreme poor (Olabisi Omodara, Laura L. Dawson, Stanley Weeraratna, Bruno Kestermont, Aklilu Nigussie). Gardens can be either individual or collective

(Bruno Kestermont, Laura L. Dawson), the latter being especially helpful for people with limited mental or physical capabilities (Laura L. Dawson).

Agricultural practices such as *organic farming* (Joseph George Ray, Paul von Hartmann, Joel Karsten, Mithare Prasad, Halimatou Baldeh, Bill Butterworth, Joseph Bagyaraj), *climate-smart agriculture* (Amanullah, Shahid Zia, Zahangir Hossain, Mithare Prasad), *low-external input agriculture and the integrated farming system approach* (Mithare Prasad) were also mentioned. Participants stressed the importance of selecting crops to suit local conditions (Chidozie Ernest, Kamaludin Abdullahi) along with year-round vegetable gardening (Zahangir Hossain); there are many less-known or forgotten edible plant species which could be explored as well (Brandon Eisler).

## Agricultural research for poverty reduction

In April 2016, CGIAR'S Independent Science and Partnership Council organized the "Agricultural Research for Rural Prosperity: Rethinking the Pathways" Science Forum. The Forum's objective was to reassess the pathways for agricultural research in order to encourage inclusive development of rural economies. Following the Forum, an *ex ante* list of 18 impact pathways was produced, linking agricultural research for development (AR4D) – and the ensuing policies, technologies, inputs, etc. – to poverty reduction in a results-based management format.

These pathways can involve, for instance, the enhancement of national food and agricultural policies and programmes. The impact pathways framework was subsequently used to propose a comprehensive collection of research papers, with each paper assessing the evidence for the key causal connections linking AR4D to poverty reduction

for each relevant pathway. The implications for research methods and design were discussed, and priority research questions were suggested as well.

On the basis of these papers, it was concluded that the direct effects of agricultural research on poverty (e.g. income gains from on-farm productivity growth) are outweighed by the indirect effects (e.g. reduced national food prices for consumers), and thus greater attention needs to be given to assessing the latter. The aim is to eventually cluster the impact pathways into operational AR4D impact networks. The papers suggest partnership priorities to achieve development impact, as well as implications for international agrifood systems, AR4D priorities and programme design. They should be published in the *Agricultural Systems* journal by the middle of 2018 (Preet Liddar).

## The role of sustainable natural resource management in supporting the eradication of extreme poverty

Sustainable management of natural resources plays an important role in the eradication of extreme poverty by guaranteeing the availability and renewal of these resources in the future, especially for those who depend heavily on them (Herbert Iko Afe, Mylene Rodríguez Leyton). Failure to sustainably manage natural resources, and the consequent loss of biodiversity, may adversely affect biological processes (Edward Tanyima), and ultimately agricultural production and food security (Prabas Bhandari, Amanullah).

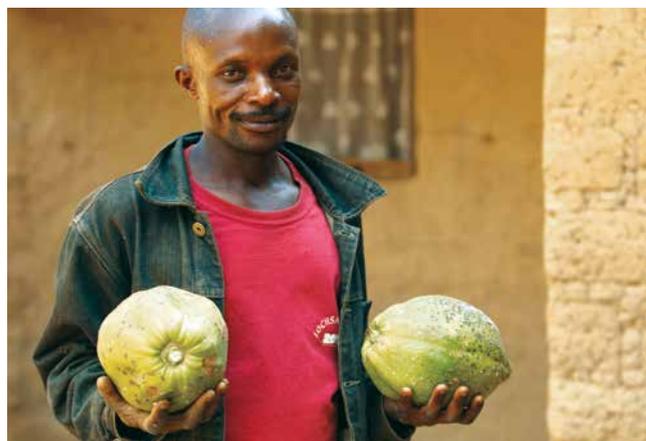
Many of the participants referred to the link between agriculture and climate – particularly climate change. In this regard, they noted the importance of adequate management and preservation of forests for sustaining agriculture and food security (Edward Tanyima, Halimatou Baldeh, Andrew Isingoma). This includes, for instance, encouraging community forest management (Halimatou Baldeh) and organizing tree planting campaigns (Takele Teshome). Additionally, the importance of sustainable soil management was underlined for agricultural production (Andrew Isingoma) and human health (Laura L. Dawson).

Sustainable natural resource management is also important from a socio-economic perspective. Modern, highly efficient agricultural systems require chemical inputs which, besides harming the environment, are not economically available to many farmers. Poor smallholders must resort to short-term

solutions to obtain these inputs, such as taking out loans, which weakens their independence and makes farming a riskier undertaking overall (Marc van der Sterren).

Indeed, this "productivist" approach to agricultural development has already led to the marginalization of vulnerable households, increased socio-economic disparities, and the erosion of traditional social networks (Florence Egal).

Participants also discussed the development of policies concerning natural resource management. Stringent sustainability measures should be included during their development, but at the same time, the local population should also be afforded the opportunity to utilize them for



their own economic development ([James Wabwire Agoro](#)). Indeed, the “restricting access approach” has not yielded substantive success; upstream and downstream engagement is needed. Furthermore, the responsibility should fall on resource

owners and users to protect and develop the resources involved; this requires awareness raising and community by-laws that address conservation, development and equitable sharing of benefits ([Takele Teshome](#)).

## Opportunities in the agricultural sector for those unable to engage in agricultural production and without access to natural resources

Several participants pointed out that those without opportunities to pursue agricultural production and without access to natural resources could work in various stages of the agrifood value chain, and in this way find pathways out of extreme poverty ([Taibat Moji Yusuf](#), [Edward Tanyima](#), [Adebayo Depo](#), [Herbert Iko Afe](#), [Marc van der Sterren](#), [Mahtab S. Bamji](#)). For those with only manual labour skills, training in various activities in the agricultural sector – for instance in

assembling and repairing agricultural equipment or sorting and grading agricultural produce – could provide options for them to earn livelihoods ([Harriet Nsubuga](#)).

Furthermore, those who are disabled or physically incapable of engaging in agricultural production could, for instance, provide training and education on nutrition as well as food processing, cleaning and storage ([Laura L. Dawson](#)).

## Policies addressing issues related to food security and extreme poverty eradication

In order to eradicate extreme poverty, strong political will and action are needed ([Hans Schaltenbrand](#), [Manuel Castrillo](#)); indeed, it was noted that this is a significant challenge. First, as entry points are hard to come by owing to the lack of support structures, the extreme poor are almost impossible to reach ([Birgit Madsen](#)). Second, there is also a lack of distributive justice – i.e. unequal access to resources and opportunities ([Wajid Pirzada](#), [Claudio Schuftan](#)).

One of the participants underlined that the approach should not be to eradicate extreme poverty, but rather to reduce economic disparities ([Claudio Schuftan](#)). The aspect of climate change, which further widens inequalities and affects the poorest in particular – especially those dependent on agriculture – would warrant specific attention in this regard ([Wajid Pirzada](#), [Rabiu Auwalu Yakasai](#), [Ikenna Ejiba](#), [Mostafa Jafari](#)).

Furthermore, the question was raised as to why the scope should be limited to rural areas. After all, food insecurity and extreme poverty also exist in urban areas, and in a context of accelerated migration, it is becoming increasingly difficult to choose where to draw the line between the two ([Florence Egal](#)).

Participants stressed the need for a multisectoral, integrated and long-term approach, suitable to local and cultural conditions. Recently, attention has increasingly focused on so-called “graduation programmes” that integrate cash transfers, education, employment support and personal guidance into one package, thus ensuring that participants not only escape poverty, but also do not fall back into it (de Volkskrant article shared by [Frank van Kesteren](#)).



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However, to ensure policies and initiatives are successful, those policies responsible for increased food insecurity and poverty first need to be identified and adapted, adopting a territorial approach and focusing on local food systems ([Florence Egal](#), [Kamulidin Abdullahi](#)). It is also essential to identify promising practices and to build the capacity of local institutions ([Florence Egal](#)).

Home-grown solutions need to be offered as well ([Wajid Pirzada](#)), and for every intervention, the local population should be involved in all stages – from design to project completion ([Lindsay Campbell](#), [Damian Sanka](#)). Community-based programmes, developed and implemented by means of the participatory learning and action methodology, and strongly supported by governmental structures at both national and local levels, may be the only solution to reach the extreme poor ([Birgit Madsen](#)).

Participants discussed a wide array of proposals on specific interrelated policy themes, which directly or indirectly influence food security and poverty levels:

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## Awareness, education and capacity building

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Education should be provided to rural citizens in such fields as nutrition, health and reproductive health, hygiene, sanitation and gender (Kuruppacharil V. Peter, Costas Apostolides, Dhananjaya Poudyal, Mithare Prasad). Strengthening agriculture–nutrition linkages will require a comprehensive education programme on linkages between production and

food security targeted at young people, along with the adoption of a community learning approach and a revival of traditional platforms of knowledge sharing (Deepak Sharma). Furthermore, awareness–raising efforts should promote dietary diversity in line with emerging lifestyles (Kevin Gallagher) while also addressing the issue of food waste (Dhananjaya Poudyal).

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## Food loss and waste

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More resources need to be devoted to preventing food loss and waste (Wajid Pirzada, Lindsay Campbell, Olutosin Otegunrin, Halimatou Baldeh, Donna Rosa). This issue could be addressed in a variety of ways, including investments in post-harvest pest control, better transportation, low-cost effective storage (Donna Rosa), processing farm produce (Halimatou Baldeh, Florence Egal) and market identification/development (Donna Rosa). Good manufacturing practices must be promoted and taught at all levels (Nurah Oseni); this also applies to preservation methods. As food waste is often caused by inconsistent power supply, particular attention should be paid to preserving perishable foods with means other than refrigeration (Nurah Oseni).



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## Health and nutrition

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Interventions that promote hygiene and sanitation are very important (Rajendan TP, Olutosin Otegunrin). Specific attention should be paid to the provision of mother and child health services (Olutosin Otegunrin), and the health status of rural families should be periodically assessed as well

(Rajendran TP). Comprehensive approaches should address all forms of malnutrition and guarantee access to sufficient and nutritious food, for instance by means of food-for-work programmes (Dhananjaya Poudyal).

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## Land tenure

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Land tenure systems need to be reviewed and revised to ensure that the extreme poor – and in particular women – have sustainable and sufficient production for local food security (Joseph George Ray, Olabisi Omodara, Halimatou Baldeh, Adebayo Depo). For instance, Conditional Land Transfers could be used to provide the extreme poor with access to land (David Odili). Furthermore, land-use conversion policies need

to be reviewed, in particular those attempting a shift “from agriculture to other non-biological production uses”. Land must be viewed in terms of the production capacity of the soil, and therefore policies should promote production (Deepak Sharma). With regard to soil quality, land improvement needs to be brought into the arena of state responsibility to ensure that land use remains productive (Deepak Sharma).

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## Microfinance

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There is growing evidence that the poor can finance most of their consumption using their own resources if they have access to suitable saving facilities. Microfinance facilities provide external credit to the poor, thus affording them opportunities to invest (Dhananjaya Poudyal,

Getaneh Gobezie). By giving them access to modern ways of saving money, these services also facilitate better financial management among the poor. In addition, these facilities may empower women by giving them more control over resources (Getaneh Gobezie).

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## Rural employment

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Small-scale industries can be an important source of income in rural areas (Mithare Prasad). Activities include those related to the agricultural sector and in particular to storage, processing and transport of agricultural produce (Florence

Egal, Mithare Prasad, Lal Manavado). Non-farm employment (Mithare Prasad) and broader diversification of employment should be encouraged as well (Costas Apostolides), especially among smallholders (Olutosin Otekunrin).

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## Women's empowerment

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The role women play in rural development and agriculture needs to be recognized. Policies promoting women's autonomy are especially favourable to the eradication of poverty (Herbert Iko Afe). In addition, women should receive greater support in terms of access to credit and control over productive resources and training (Olutosin Otekunrin, Halimatou Baldeh, Rajendran TP, Mithare Prasad). Given their already heavy work burdens, freeing up women's time could positively influence nutritional outcomes as well (Donna Rosa).



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## Fighting extreme poverty through agriculture: examples and experiences

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### Africa

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In China, Lanzhou University has carried out field demonstrations on low-cost, high-yield plastic film mulching in dry areas of several African countries. Conducting these demonstrations over a long period helped this initiative gain

local trust. As a result, it has been increasingly adopted by local residents, leading to increased food supplies and more people working productively in agriculture (Zhanhuan Shang).

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### Colombia

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The national Colombia Siembra initiative aims to support all agricultural stakeholders by providing them with adequate knowledge, technology and financial instruments, and by creating a favourable environment for agricultural development. The specific objectives are to:

1) increase agricultural supply to guarantee national food security;

2) increase the area and yields devoted to the production and promotion of agricultural and agro-industrial exports;

3) promote the development of agricultural businesses to improve producers' incomes; and

4) strengthen technological development and services in the agricultural sector (Mylene Rodriguez Leyton).

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### India

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In India, there are several initiatives that aim to contribute to poverty reduction and increased food security. First, in the state of Telangana, the Dangoria Charitable Trust promotes the cultivation of nutrient-rich crops and has introduced backyard poultry using chickens with high egg yields. These have both contributed to improved household nutrition (Mahtab S. Bamji). Second, the Annamrit Farmers As Owners Foundation aims to build strong partnerships between farmers, business partners, financial supporters, and inclusive development actors

in order to build healthy food value chains (Laxmi Prakash Semwsl). Third, the Kamalnayan Jamnalal Bajaj Foundation, active in the Wardha district, has promoted multicropping and facilitated easier and more strategic sales of agricultural produce. In addition, by supporting the establishment of small-scale food processing it has generated employment opportunities for the landless poor (Sonali Phate). Finally, the Indian NGO VAAGDHARA uses the participatory learning and action approach with marginalized farmers in the district of

Rajasthan to promote nutrition-sensitive farming. This has helped reducing hunger substantially and moved people out of "nutrient poverty" (Deepak Sharma).

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## Kenya

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Vestergaard, in collaboration with the Kenya Seed Cooperation, has been working toward the eradication of extreme poverty in rural areas of Kakamega County. Its initiative provides an anti-poverty starter kit for farmers, which includes the tools needed for maximizing the production of high-quality maize, as well as safe storage option for surplus maize so that it can be sold when prices are higher. Farmers are connected to a simple, decentralized profit-sharing warehousing system, which is managed through a blockchain phone application. The application sells the produce at an optimal price; profits are shared with farming families via the application as well. In turn, the warehouse owner is connected with key markets through the East African Grain Council and the National Cereals Board. The starter kits are cheap, and can potentially move farmers out of extreme poverty within two harvest seasons (Georgina Bingham Zivanovic).

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## Nigeria

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The AMO poultry industry has established an outgrower scheme which has succeeded in lifting poor farmer households out of poverty. AMO members are provided with day-old chickens, feed, equipment and extension, and then paid to rear them for six months. In addition to those rearing the animals, the transporters, distributors, and people working in the feed and vaccine industry have significantly benefited from this scheme (Taibat Moji Yusuf).

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## Pakistan

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The Lok Sanjh Foundation forms Village Women Committees representing smallholders and landless families, and engages these to build and implement community-based food and income security strategies (Shahid Zia).

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## Uganda

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The country's home-grown school feeding programme has greatly benefited smallholders, allowing them to produce both for their own consumption and for surplus sold at schools or markets. However, at the same time, the income generated is often misused to purchase non-food items and less nutritious foods, which has led to increased levels of undernutrition in rural areas. Hence these programmes should be complemented by nutrition education and streamlined procurement procedures (Alum Daisy).

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## Zimbabwe

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In several communities in Zimbabwe, a livelihood model integrating agroforestry with beekeeping has played an important role in poverty eradication. The model offers many different income opportunities, such as beeswax production and sunflower oil extraction. The new income has been used towards tree planting programmes, crop production and fire prevention (Robert Mutisi).

### Agriculture for poverty eradication: lessons from history

In some cases in Africa, agriculture that is well organized has helped to eradicate extreme poverty. In Bamileke, Cameroon, some densely populated districts have managed to produce a surplus to feed the towns of Douala and Yaounde. In the Machakos district in Kenya, the recent population growth has been accompanied by an unprecedented intensification of agriculture and by improvements in resource management, with farmers widely adopting innovative agricultural techniques. Over time, demographic growth has led to an increase in food demand, available jobs, and technical innovation. Between 1930 and 1990, the value of production per capita tripled, while that of production per hectare doubled during the same period; most notably, extreme poverty vanished (Emile Hougbo).

In Colombia, coffee cultivation has significantly contributed to poverty eradication. In 1927, Colombian coffee growers formed the National Federation of Coffee Growers of Colombia (FNC), which has a presence in all coffee-producing rural areas. Being one of the largest rural NGOs in the world, FNC represents producers nationally and internationally. While FNC aims to increase the quality of life of the coffee producers, it should be noted that, *inter alia*, grain collectors are not always fairly remunerated (Mylene Rodríguez Leyton).

Experiences from the Indian states of Gujarat and Telangana in the last decade show how integrating local livestock breeds with local agriculture can help to reduce extreme poverty by providing a source of nutrition and by strengthening local livelihoods. The local breeds (which have already been improved) and local resources have automatically adapted to climate change. This shows that instead of planning major changes, focusing on minor alterations to facilitate life cycles (of livestock, crops and microbes), combined with getting local people together for a common cause, can be very effective (Devinder Sadana).

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## WEBSITES

3LM – Land and Livestock Management for Life

[www.youtube.com/watch?v=SCDqQGaVEm4](http://www.youtube.com/watch?v=SCDqQGaVEm4)

Compatible Technology International

[www.compatibletechnology.org](http://www.compatibletechnology.org)

Coupled Ecology and Agriculture Revived on Arid Land

[www.chinatoday.com.cn/english/society/2015-12/02/content\\_709109.htm](http://www.chinatoday.com.cn/english/society/2015-12/02/content_709109.htm)

Evaptainers

[www.evaptainers.com](http://www.evaptainers.com)

First International Congress on Postharvest Loss Prevention

<https://postharvestinstitute.illinois.edu/congress/archive-first-international-congress-on-postharvest-loss-prevention>

Instituto de Desarrollo Rural

[www.inder.go.cr](http://www.inder.go.cr)

Purdue Improved Crop Storage (PICS)

<https://picsnetwork.org>

World Food Preservation Center

[www.worldfoodpreservationcenter.com/index.html](http://www.worldfoodpreservationcenter.com/index.html)

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