

Policy Brief

October 2019, PB-19/32

The critical importance of land and water

By Isabelle Tsakok

Summary

If the concern is solely to increase fertilizer use by Sub-Saharan Africa's smallholders, price subsidy for inorganic fertilizer can be effective. The strengths and weaknesses of relying primarily on price subsidies to promote fertilizer use have been discussed at length and will therefore not be dealt with here². But if the goal is to assist smallholders use fertilizer productively, profitably and sustainably—financial and environmental, much more is required. Making fertilizer affordable is necessary but far from sufficient. Fertilizer is effective only when it is part of a package.

Fertilizer policy must ensure, at a minimum, that smallholders have access to and tenure security on the land they till; and control of water when they need it. These conditions are critical when smallholders' need land as an income earning asset (not only for subsistence) and as a source of security to thrive commercially in a risky sector. This has been the experience of countless millions who have adopted the Green Revolution (GR) in Asia. To the extent governments have not been able to create these conditions for smallholders, uptake of fertilizer in particular, and of the GR in general, has been undermined. For Sub-Saharan Africa (SSA),³ the pivotal importance of creating such conditions with respect to land and water resources for smallholders is widely recognized. For example, the Malabo-Montpellier (MAMO) panel (2018) emphasized the importance of both increasing irrigation and ensuring land tenure security.4 Based on extensive scholarship, the Conference on Land Policy in

2. See for example: Morris, Michael, Valerie A. Kelly, Ron J Kopicki, and Derek Byerlee. 2007. Fertilizer use in African Agriculture: Lessons

learnt and good practice guidelines. Report # 39037. Directions in Development, Agriculture and Rural Development, World Bank. https://openknowledge.worldbank.org/bitstream/ handle/10986/6650/390370AFR0Fert1010FFICIALOUSE00NLY1. pdf?sequence=1&isAllowed=y 3. Throughout, the terms Africa, Sub-Saharan Africa, and SSA are used

interchangeably.

^{4.} Malabo-Montpellier (MAMO) Panel. 2018. Water-wise: Smart Irrigation Strategies for Africa. https://www.mamopanel.org/media/uploads/ files/Water-Wise_Smart_Irrigation_Strategies_fopdfr_Africa.

^{1.} The price issue has been dealt with by Guedegbe, O. T., & Doukkali, M. R. (2018). Fertilizer use in Africa: A Price issue. Rabat: Policy Center for the New South. Retrieved from https://www.policycenter.ma/sites/ default/files/OCPPC-PB1827-ENG.pdf

Africa (CLPA 2017) pointed out the key importance of an inclusive and equitable access to land especially when youth is concerned.⁵ Byamugisha (2013)⁶ proposed a 10 point scaling-up program for African governments to reform land governance; the lack of which, he argued, may be a root cause of low productivity and widespread poverty in Africa.

To translate such recognition into action has major political economy implications for the role of the state and its partnership with the private sector. At issue for land and water resources are (i) improving land governance in terms of equitable access, tenure security, accountable and affordable land administration; (ii) major investments in irrigation and irrigation management; and (iii) strengthening of agricultural research, extension and farmer education for greater productivity and resilience especially in a scenario of climate change.

The imperative of raising agricultural productivity growth for poverty reduction and food security requires that Africa's leaders go well beyond subsidizing fertilizer prices to mobilizing Africa's substantial land and water resources in a way that incentivize and enable millions of smallholders to increase fertilizer use not only for subsistence but for income increase and profit; while increasing their climate resilience and their stewardship of Africa's land and water resources.

Introduction

Thanks to the Green Revolution (GR) in wheat and rice which swept through Asia in the mid-1960s to the 1990s, the fast growing population of Asia avoided famine on a Malthusian scale. The goal of CAADP since 2003, and the Alliance for a Green Revolution in Africa (AGRA) since 2006, is to launch a GR in Africa to reduce widespread hunger and poverty; raise incomes and strengthen food security. While this Policy Brief fully recognizes that GR is multi-causal, it focusses only on two key factors on the input side of fertilizer use; two factors which

5. The Africa We Want: Achieving socioeconomic transformation through inclusive and equitable access to land by the youth https://www.uneca.org/clpa2017

smallholders need if they are to use fertilizer⁷ to intensify crop production in a way that maintains soil fertility, and promotes productivity growth without degrading basic land and water resources.

These two factors are water and land: (1) the need for water for any agriculture is obvious; but water control is at issue here as water is an essential complementary input to fertilizer: otherwise the fertilizer will "burn" the plant.; and (2) land, not only access, but also tenure security. Soil fertility is essential for land being productive; hence the key importance of fertilizer. This is obvious. What is not so obvious is that the proper application of fertilizer is required to realize the promise of higher yields, and to prevent soil and water degradation. Agricultural research and extension services are in turn necessary to generate the knowledge and the knowhow to assist smallholders, especially as planting conditions change with a warming climate.

and illustrates the challenge of improving (i) water control for smallholder agriculture in SSA and (ii) access and tenure security to the land smallholders till. ⁸ Water an essential complementary input to fertilizer use: If the goal is not solely to increase fertilizer use but to improve nutrient use efficiency, then how much water is applied and when, is of critical importance for

To help shape fertilizer policy, this Policy Brief explains

"Soil water content is the single most important factor controlling the rate of many biological processes, which influence nutrient availability" (Drechsel et al, 2015: 3)⁹ Indeed, there is a close synergism between soil fertility and water use efficiency for "Poor soil fertility limits the ability of plants to efficiently use water (Bossio et al, 2008). Thus concern for soil fertility is not only about

^{6.} Byamugisha, Frank F.K. "Securing Africa's Land for Shared Prosperity," a World Bank report released on July 22, 2013, argued that poor land governance – the manner in which land rights are defined and administered – may be the root of the problem of widespread poverty and low agricultural productivity. Byamugisha was Lead Land Specialist, Africa Region). https://www.worldbank.org/en/region/afr/publication/securing-africas-land-for-shared-prosperity

^{7.} Throughout this Policy Brief, fertilizer refers to both organic (e.g., manure, compost, etc.) and inorganic (chemical) fertilizer. The terms "SSA" or "Africa" are used interchangeably.

^{8.} This Policy Brief is one of two Policy Briefs on fertilizer policy for smallholder agriculture in SSA. The other is on the importance of viewing fertilizer policy as an integral component of a holistic approach. The two PBs are a follow up to the Policy Paper entitled "From Asian Green Revolution 1.0 to Sustainable Green Revolution 2.0: Toward a Fertilizer Policy for Smallholder Agriculture in Sub-Saharan Africa" by Isabelle Tsakok and Tharcisse Guédégbè; Senior Fellow, Policy Center for the New South; and Research Engineer, Pole of Humanities, Economics and Social Sciences, Mohammed VI Polytechnic University. PhD student, Michigan State University, respectively.

^{9.} Drechsel, Pay, Patrick Heffer, Hillel Magen, Robert Mikkelsen, Harmandeep Singh and Dennis Wichelns. 2015 "Managing water and nutrients to ensure global food security while sustaining ecosystem services"; Ch 1: 1-7, in Managing Water and Fertilizer for Sustainable Intensification; (edi) Drechsel, Pay, Patrick Heffer, Hillel Magen, Robert Mikkelsen, Dennis Wichelns. International Fertilizer Industry Association; International Water Management Institute; International Plant Nutrition Institute; and International Potash Institute.

the proper dozes of fertilizer application but also about timely water availability and water management.

Timely water availability and water management in SSA an acknowledged necessity: At a continent-wide level, the Malabo-Montpellier Panel (2018) argued that irrigation should be raised to a top policy and a major long-term investment priority if Africa is to successfully meet the challenge of ensuring food security for a growing population. Currently, agriculture in SSA is primarily rain-fed and almost exclusively when it comes to food production. Compared to Asia and Latin America, irrigated agriculture in SSA is minuscule (percent of arable land): roughly 6%¹⁰ versus 37% and 14% respectively. Over the last 40 years or so, food crop productivity has remained stagnant, especially when compared to Asia and the Pacific as well as Latin America and the Caribbean (Jayne et al, 2010: Fig 1).11 Jayne et al (2010) argue that several factors responsible for such low productivity often boil down to low input use, in particular lack of irrigation, fertilizer and high yielding cultivars. Low as cereal yields are today, they are projected (for 2050) to decline substantially further under a climate change scenario with rising temperatures, changing rainfall patterns with more erratic precipitation; and more frequent severe weather events. These bleak projections however need not materialize provided substantial investments in irrigation, among other things, are made. The good news is SSA has significant potential: from the current 7.7 million ha to 38 m ha. 12 Some SSA countries have already invested in promising technologies; e.g., Kenya, Niger and Nigeria but these are still small scale and need to be significantly scaled up. The need to give smallholders better water control through irrigation is not only critical for increased fertilizer and HYV use; but also to increase their resilience in the face of more frequent unfavorable and extreme weather events brought about by climate change. In fact, "It is estimated that without additional investment in irrigation, the share of people at risk of hunger could increase by 5 percent by 2030 and 12 percent by 2050" (MAMO panel, 2018: 18).

Irrigation is not just about water availability—key supportive policies and institutions needed: The Asian

experience with the GR shows that providing irrigation water is just the beginning. There are at least three considerations, otherwise the productivity benefit of the GR for the majority of smallholders is not likely to be attained; and/or not sustainable financially or environmentally. These are: (i) irrigation systems have to be properly maintained for the water supply to be reliable; (ii) smallholders need to be well informed by agricultural research and extension services to make the most of their input investment; and not to degrade valuable land and water resources; (iii) farmers need land tenure security to want to make long term investments in the fertility and sustainability of their resources. The main reason these considerations have been ignored or underestimated has been misguided public expenditure. Important cases illustrating these problems include:

The case of Punjab, India: The heavy subsidies maintained for decades on inputs (power, fertilizer, canal water) and the system of guaranteed Minimum Support Prices (MSP) have encouraged excessive input use with negative consequences for sustainable resource use (in particular, over pumping of ground water); poor operation and maintenance (O&M) leading to a deterioration of the canal system, contributing in turn to an overuse of ground water; a research and extension system unresponsive to emerging challenges as most of the budget is spent on personnel and on input subsidies. Furthermore, given the prevailing structure of income and wealth, larger farmers are the main beneficiaries of the subsidies, which were launched in a highly protected economy. It is true that with these policies launched in the mid-1960s, Punjab adopted the GR in wheat and then, rice. Irrigation investment was extensive: in the 2000s, some 95 percent of Punjab's sown area was irrigated. Today, it has the highest cropping intensity; and the most intensive use of chemical fertilizers and pesticides. Punjab is known for being the bread basket of India. Although it has only 3 percent of India's sown area, and 1.5 percent of its farming population, Punjab produces 20 percent of India's wheat and 10 percent of its rice. Since the 1990s however, total factor productivity for the crop sector has stagnated, and annual agricultural growth has slowed down to 2.6 percent from 5 percent in the 1980s (World Bank, 2003) 13. Thus, it is not that

^{10.} There are other estimates; e.g. 3-5 percent of cultivable land, but they are all very low.

Jayne, T S, David Mather, and Elliott Mghenyi. 2010. "Principal Challenges Confronting Smallholder Agriculture in Sub-Saharan Africa.." World Development, Vol. 38, Issue 10:1384-1398.

^{12.} Malabo-Montpellier (MAMO) Panel. 2018. Water-wise: Smart Irrigation Strategies for Africa. https://www.mamopanel.org/media/uploads/files/Water-Wise_Smart_Irrigation_Strategies_for_Africa.pdf

^{13.} World Bank. Sept 2003. India: Revitalizing Punjab's Agriculture. Report # 37069. http://documents.worldbank.org/curated/en/363871468050066952/pdf/370690INORevit1whiteOcover01PUBLIC1.pdf

these subsidies have had no desired results, but they are now becoming part of the problem not part of the solution of transforming Indian agriculture. These subsidies crowd out responses needed to thrive in a world of climate change and increasing resource degradation. As of the 2010s, despite the uptake of the GR in the mid-1960s, Indian agriculture is still of low productivity. During the later years (2013-15), annual agricultural growth averaged 2 percent, characterized by low productivity; growing water and land scarcity; and rising labor costs exacerbated by frequent droughts and floods (World Bank, Nov 2017: 1)¹⁴

- The case of irrigated rice in Indonesia-during Suharto: Indonesia, under Suharto (1966-97) is well known for being an oil-exporting nation that invested heavily in its smallholder agriculture. It devalued the Rupiah twice to avoid the "Dutch Disease" 15 which would undermine agriculture and the nonoil economy. For Suharto, rice self-sufficiency was a top priority. To promote domestic rice production, GOI subsidized the adoption of the GR technology in HYV (e.g., irrigation, fertilizers, pesticides, improved seeds) with over 80 percent of rice production irrigated. It also guaranteed a floor price to producers, while maintaining a ceiling price for consumers. In the Suharto period, rice was a success story with per capita consumption rising by almost 60 percent between 1966 and 1992. Average rice yields nearly doubled from 2350 kg/ha in 1970 to 4300 kg/ha in 1990 with yields in Java being higher (Hill, 2000: Tab.7.1). 16 Gunnar Myrdal in his Asian Drama ¹⁷ held out no hope for Indonesia. However he was wrong: poverty was substantially reduced and Indonesia achieved rice self-sufficiency in 1984.
- Regress on smallholder agriculture and rice productivity—post Suharto: The collapse of the Suharto regime in 1997/98 was a watershed event for agriculture as for the entire economy. Total factor productivity (TFP) growth in agriculture slowed

from an annual average of 2.5 percent (1968-92) to a low of 0.1 percent per year (1993-2000) (World Bank, May 2007: 1, Tab 1.1).18 A major cause of the slowdown was a relative slowdown in both public and private investment as a percentage of agricultural GDP. After the financial crisis, investment in irrigation stalled with the result that much of the irrigation infrastructure deteriorated. Agricultural extension services also suffered a serious decline, with far fewer farmers being served after the decentralization. Withthe latter, in provinces where agriculture was not as high priority as it was with the central government, the outreach and quality of extension services suffered. The result was that farmers were even more poorly served than before (World Bank, 2008: 14)19. The need for research on how to increase yields in rice without increasing costs was clear as rice yields have stagnated (World Bank, May 2007: x). Under the presidency of Susilo Bambang Yudhoyono (2004-14), the GOI took important steps to boost agricultural productivity, in particular hybrid seeds and irrigation investments. However, it was not re-orienting its public expenditures, away from input subsidies (on fertilizer, seed and credit), despite evidence that these subsidies were having limited positive impact on production and productivity (World Bank, May 2007: 44). With respect to land, Suharto's government took land away from smallholders to lease to large-scale investors for plantations, with minimal compensation to the customary owners. Moreover, Suharto's regime did not implement measures to give land tenure security to smallholders (Indonesia has three categories of land -private, state, and customary) as was done, for example, in Malaysia, its neighbor. Conflicts between local communities and companies seeking land have been a recurrent issue. (Cramb and McCarthy, 2017: 41).20 Thus, again, Indonesia's case shows the value of input subsidies alone to promote a sustainable GR is short-lived if the government does not at the same time strengthen supportive institutions delivering basic public goods & services in terms of irrigation infrastructure, agricultural research and extension;

and land tenure security for smallholders.

^{14.} World Bank. Nov 8, 2017. Project Appraisal Document: India - Tamil Nadu Irrigated Agriculture Modernization Project, Report # PAD 1947. http://documents.worldbank.org/curated/en/708761512356434690 pdf/India-TN-IAMP-PAD-November-8-2017-rev-11102017.pdf

^{15.} During the oil price spikes of 1973/74 and 1979/80.

Hill, Hal. 2000. The Indonesian Economy. Second Edit. Cambridge: Cambridge University Press

^{17.} Myrdal, Gunnar. 1968. Asian Drama: An Inquiry into the Poverty of Nations. Hamondsworth: Penguin

^{18.} World Bank. May 2007. Agricultural Extension Services in Indonesia: New Approaches and Emerging Issues. Report # 38468.

World Bank. June 2008. Sustainable Management of Agricultural Research and Technology Dissemination: A Strategic Framework (SMARTD). Report # 44367-ID.

^{20.} Cramb, Rob and John F. McCarthy. Eds. 2017. The Oil Palm Complex: Smallholders, Agribusiness, and the State in Indonesia and Malaysia. NUS Press, National University of Singapore, Singapore.

The case of smallholder agriculture and rice productivity in the Philippines: The Philippines is the home of the IR8, the HYV in rice which, together with HYV wheat, from CYMMIT launched the GR in Asia. Like in Indonesia and India, rice self-sufficiency has been a top policy priority for decades and governments invested heavily in the "typical" GR package. Public investment increased in irrigation (which received the lion share of government spending in agriculture). Irrigated areas increased substantially from 1968 to 1986 (World Bank, Oct 1987: Annex 6, 49-50, Tab 1).21 Given expanded irrigation and the spread of HYV technologies, growth in irrigated palay (paddy) yields was substantialsuch yield growth accounted for more than 80 percent of production growth from rice. Under Marcos' program to achieve rice self-sufficiency -- Masagana 99, (1974-82), government subsidized irrigation, credit, extension, and fertilizers. Agricultural output grew at an average of 4.6 percent per year between 1965-80, comparable to annual agricultural growth performance in Indonesia and Thailand (Balisacan et al, 2004: 225, 246-248). ²² But, TFP growth in the Philippines agriculture has been quite stagnant over the past two decades (that is, since the mid-1980s) at 0.2 percent a year, compared to 1.0 percent in Thailand, 1.5 percent in Indonesia, and 4.7 percent in China (World Bank, 2010: 73)²³. Despite a head start on the GR, agricultural productivity remains low, and agriculture and the rural sector remains the refuge of the poor; "for 3 out of every 4 poor Filipinos live in the rural sector and most of them depend on agriculture" (World Bank Group, May 2014: 2-3). 24

Major contributors to the Philippines' poor agricultural performance are again lack of key supportive institutions in irrigation; in agricultural research and extension; and limited access to and tenure security on land for the

21. World Bank. Oct 21, 1987. Philippines Agricultural Sector Review. Vol 1 & 2) Report # 6819-PH. There are three types of irrigation systems: (1) the National System from a reservoir or run-of-the-river gravity systems. These are large-scale and state run; (2) Communal Systems which are small scale and run by the farmers themselves; and (3) Pump systems which can be either privately or publicly run

majority of smallholders, among other things. Thus:

- Misguided government support-neglect of supportive institutions: Government Philippines (GOP) funds were focused on subsidizing private goods that would promote palay (paddy), namely hybrid seeds, fertilizers and other chemicals. On irrigation, the funds also favored palay cultivation, to the detriment of improving the functioning of the system by strengthening the institutional capacity for managing the system; correcting design mistakes and poor construction; and improving cost recovery for better maintenance. Despite the substantial sums spent on irrigation, only 29 percent of the potentially irrigable areas was developed by early 2000s-thus only 1.34 m ha versus 4.7 m ha. (WBG 2007: 26)²⁵ The misallocation of public expenditures starved agriculture of key public goods and services including research and extension services; dissemination of market information for farmers and processors; and rural marketing infrastructure (WBG 2007: 24, 29-31). Analysis of trends of public expenditures by policy instrument in agriculture undertaken (for 2003-05) by David argues that " ... Less than 50% of public spending on agriculture has been devoted to productivity-enhancing, public-good type expenditures." Investment in public infrastructure has declined (World Bank, May 2010: 69). Most of the funds were allocated to private goods such as domestic and foreign grains trading; planting materials and inputs; agro-processing equipment and facilities, etc. 26
- Repeated land reform attempts ineffective at equalizing land ownership, and ensuring tenure security: Repeated attempts at land reform, often announced with much fanfare (e.g., as by Marcos and Aquino), have not succeeded, even after decades, in creating a unimodal structure of farm ownership. Specifically, two broad groups of problems undermined the promise of land reform. These were: opposition from politically powerful groups--the modern cacique class (Mayo, 1925:

^{22.} Balisacan, Arsenio M, Nobihuko Fuwa, and Margarita H. Debuque. "The Political Economy of Philippine Rural Development Since the 1960s." Ch 7 (p 214-293) in Akiyama, Takimasa and Donald F Larson (Eds) 2004. Rural Development and Agricultural Growth in Indonesia, the Philippines and Thailand. Report no. 43119.

^{23.} World Bank. May 17, 2010. The Philippines: Fostering more inclusive growth. Report # 49482.

^{24.} World Bank Group. May 14, 2014. Country Partnership Strategy for the Philippines for the Period FY 2015-2018. Report # 78286-PH.

^{25.} World Bank Group. June 2007. Philippines: Agriculture Public Expenditure Review. A Technical Working Paper.

^{26.} David, Christina, in The Philippine Economy, Development, Policies, and Challenges: Agriculture, by Arsenio Balisacan and Hal Hill (eds.), Ateneo de Manila University Press, Quezon City 2003.

9-10)²⁷; and institutional and political factors—poor design and implementation of land reform measures. The key problems under Marcos were caused largely by opposition of the powerful landlord class; as well as the poor policy design and implementation, including underfunding. Thus, after 20 years of implementation of C. Aquino's Comprehensive Agrarian Reform Program (CARP, 1987), its positive impact on redistribution, tenure security, poverty reduction and productivity increase has been modest at best. Key problems identified were: (WBG, 2009: 2-5, 21-23)²⁸.

- The slow pace of compulsory purchase of land for redistribution due to landowner opposition and underfunding, especially in areas of high productivity. This slow pace in turn undermined the efficient functioning of land markets, especially rental markets.
- Government failure to fully link and integrate land reform with the delivery of support services and the development of public infrastructure, especially in areas of highest poverty, where farmers depend on agriculture as the main pathway out of poverty.
- The issuance of collective Certificates of Land Ownership Awards (c-CLOAs) on 71 percent of land redistributed or 21 percent of all titles issued.

 Lack of tenure security to individual households in turn limited the value of redistributed land as a collateral for credit and investment, both important for poverty reduction and productivity improvements.

Land for smallholders—access to and tenure security critical factor to raise their productivity and incomes: Worldwide experience, not just the examples above, shows that productive fertilizer use needs not only water control but key supportive institutions to translate shortterm gains to long term, transformational results. More broadly, the adoption by smallholders of a high-inputhigh output technology that can transform agriculture requires that they invest in their farming. Analysis by the MAMO panel (2018) clearly stated that "Lack of land tenure security may discourage farmers from making long-term investments or increase land grabbing because of the potential for irrigation. Irrigation uptake therefore requires a transparent land tenure system that guarantees rights for producers, particularly for the most vulnerable, including women and young people." ²⁹ The critical importance for achieving inclusive development by ensuring access to land and tenure security for Africa's smallholders, especially for youth, has been emphasized by the Conference on Land Policy in Africa (CLPA) 2017. 30 In addition, the structure of land distribution; the status of land governance; and their key importance in Africa's development were extensively researched by UNECA in 2010. The World Bank's 2013 flagship report Securing Africa's Land for Shared Prosperity also emphasized the

^{27.} Mayo, Katherine. 1925. The Isles of Fear – The Truth about the Philippines. New York. Mayo points out that there are three distinct groups of people in the Philippines: two minorities, the mountain people of the Island of Luzon or the Igorots; the Moros or Mohamedans of the southern islands, and the majority, the Christian Filipinos. In the early 20th century, some 94 percent of Filipinos, called taos, were subservient to a minority—4 percent of total—the cacique class. Cacique is the moneyed class from which bosses, local headmen and politicians come.

^{28.} World Bank Group in the Philippines. 2009. Land Reform, Rural Development, and Poverty in the Philippines: Revisiting the Agenda. Technical Working Paper # 49503

^{29.} The Malabo-Montpellier Panel: Water-wise-Smart irrigation Strategies for Africa . 2018 - https://www.mamopanel.org/resources/reports-and-briefings/water-wise-smart-irrigation-strategies-africa/

^{30.} The Africa We Want: Achieving socioeconomic transformation through inclusive and equitable access to land by the youth https://www.uneca.org/clpa2017

key point.³¹ It argued that poor land governance may be the root problem of Africa's chronic poverty. The outstanding agricultural performance of Rwanda's Crop Intensification Program (2007) building on the Land Use Consolidation Program is supporting evidence. Further afield and decades ago, the transformational impact of land reform in East Asia (South Korea, Japan, and Taiwan, China); and more recently the Household Responsibility System (HRS) (1981) of China under Deng Xiaoping and of the de-collectivization of agriculture under Doi Moi (1988) and the tradability of land use rights (1993) in Vietnam, also show how transferring land and land use rights on a secure basis empower smallholders, releasing their productive potential.

Conclusion

Subsidizing fertilizer prices to promote its use can at best be a short term measure to kick start fertilizer use. Alone, it cannot address the many structural constraints that undermine incentives to use fertilizer in the first place. Time and again, experiences in Asia where the GR took off starting in the mid 1960s, shows that governments must, at a minimum, recognize the critical importance of land –access to and tenure security—and water control to smallholders, if the governments want them to use fertilizer in a productive, profitable and sustainable—financial and environmental—way. Smallholders of Africa are no different.

^{31.} A 2013 World Bank report "Securing Africa's Land for Shared Prosperity," (Author: Frank Byamugisha, Lead Land Specialist, Africa Region) released on July 22, argued that poor land governance – the manner in which land rights are defined and administered – may be the root of the problem. "This new report suggests a series of ten steps that may help to revolutionize agricultural production and eradicate poverty in Africa. These steps include improving tenure security over individual and communal lands, increasing land access and tenure for poor and vulnerable families, resolving land disputes, managing better public land, and increasing efficiency and transparency in land administration services."

 $[\]underline{\text{https://www.worldbank.org/en/region/afr/publication/securing-africas-}} \underline{\text{land-for-shared-prosperity}}$

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Isabelle Tsakok is an adjunct professor at SIPA and a Senior Fellow at the Policy Center for the New South, previously known as OCP Policy Center, who focuses on rural development, agricultural economics, policy analysis, food security and poverty reduction. She holds a PhD in Economics. Dr. Tsakok has worked on development issues for over twenty-five years, first as World Bank staff and since retirement as a consultant. She has specialized in policy analysis, program and project formulation and evaluation, research and training activities in agriculture, agro-business, rural development and poverty reduction. She has worked in most regions of the developing world: Africa, Asia - South, Southeast and East, North Africa and the Middle East and Latin America.

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