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Staples, efficient smallholders, poverty and trade

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Staples production: efficient 'subsistence' smallholders are key to poverty reduction, development, and trade

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A. Introduction

Globally, about a billion people eat far too much. About another billion eat far too little. Mass death, disease and misery are caused both by nutrient deficiency and by nutrient excess.[1] Yet far too little food is transferred from the overfed to the underfed by trade, migration or financial transfers, as they affect food consumption and/or the use of land and other farm resources. That is the greatest failure of economics in the world today. It is only partly the result of poverty and inequality. It is not substantially the result of "market failure". It is, in part, the result of market *success*, combined with human failure to manage incentives, institutions (including those of control over land), information, and technical progress. In particular, we need much better policies to make incentives, institutions and public goods, affecting production and trade in food staples, favourable to low-income, family-based smallholders *and, in particular, to "subsistence farmers*.

Subsistence farmers are smallholders. They usually rely mainly or wholly on family labour. They grow mainly staple foods, in amounts at best sufficient to feed their families - or, in most cases (sub-subsistence or (food) *deficit farmers*), less than sufficient. Food deficit farm families grow mainly food for home consumption, but need more food than they grow. They buy in the difference with income from selling non-food farm products, hired labour, or products of small non-farm enterprise.

"Subsistence farming" has become a term of low abuse. Most writing about farms, especially African farms, assumes (a) a stark contrast between subsistence and commercial farms, (b) inefficiency of subsistence farms and (c) the need for a rapid shift from subsistence to commercial farms - and sometimes from small to large farms - for successful development. Yet, as almost all agricultural economists (but few macro-economists?) know, the three assumptions are dead wrong logically, economically, historically and in political practice.[2]

- Logically, subsistence farms, even deficit farms, can be commercial. They can and do obtain cash in several ways (see below), including sale of farm output. They are substantial buyers and users of farm inputs.
- Economically - where savings are scarce, and rural labour still plentiful and increasing - such farms are more socially efficient than large farms. That's not because their *production* costs, per unit of output or of land, are very different. It's because small farms, with small areas and mainly family workers, enjoy lower unit *transaction* cost in managing labour. Thus small subsistence farms, including deficit farms, normally produce more per unit of scarce land and water, with less use of scarce capital, and more employment. And they are innovative as big farmers: in many studies small farms actually use more fertilizer per hectare.
- Historically, Asia's take-off since 1965, into rapid growth with massive poverty reduction,- is based on a green revolution in food staples output, mainly on subsistence and near-subsistence smallholdings. (Arguably the same was true of much of Europe in the nineteenth century.) Combining the history and the economics, in a big majority of countries in Asia, Africa and Latin America with decennial agricultural censuses, proportions of farmland in small farms have risen - reflecting their efficiency and ability to innovate.
- In political practice, labour forces in Africa (and parts of Asia) will grow at over 2%/year for decades. These people won't escape poverty without extra demand for labour and/or cheaper locally available food staples. Despite urbanization, neither will happen without sustained growth of farm output, especially staples, on subsist-

[1] In 2008, some 1·5bn adults were overweight (BMI ≥25 kg/m2), including 500mn who were obese (BMI ≥30 kg/m2): M. Finucane, G. Stevens, M. Cowan, G. Danaei, J. Lin, C. Paciorek, G. Singh, H. Gutierrez, Y. Lu, A. Bahalim, F. Farzadfar, L. Riley and M. Ezzati, 'National, regional, and global trends in body-mass index since 1980', Lancet 2011 Feb 12:377(9765):557-67. In 2011, about 310mn under-fives were mildly, moderately, or severely stunted and about 260mn - plus hundreds of millions of over-fives - were mildly, moderately, or severely underweight: G. Stevens, M. Finucane, C. Paciorek, S. Flaxman, R. White, A. Donner and M. Ezzati, 'Trends in mild, moderate, and severe stunting and underweight, and progress towards MDG 1 in 141 developing countries: a systematic analysis of population representative data', Lancet, 2012 Sep 1:380(9840): 824–834. 'Mild, moderate and severe' mean, respectively, 1, 2 or 3 standard deviations below the NCHS norm.

[2] See below & M.Lipton, Land Reform in Developing Countries: property rights and property wrongs, London: Routledge 2009; R. Eastwood, M, Lipton & A. Newell 2010, 'Farm size', in Handbook of Agricultural Economics, 4: Agricultural Development: Farm Policies & Regional Development: 3323-94.

ence smallholdings. The political consequences if that doesn't happen - mass poverty amid elite take-off are cloudy, but bad. Yet Asia's green revolution reveals practicable pro-smallholder, pro-subsistence policies that are efficient, equitable, and sustainable politically, fiscally and environmentally.

With such policies, poverty reduction spreads to left-out regions and groups, even in hard economic and climatic conditions. And each "unit" of poverty reduction produces better nutritional outcomes. Such "pro-subsistence" policies, apart from reducing misery, are not anti- trade, but steer public and private resources in ways that increase trade. Efficient subsistence farming is the mother of food trade, not its enemy.

That is the substance of this talk. First I need to spell out some of the relationships between poverty, nutrition, food staples and subsistence - and, without drowning you in data, to set out some facts, and some areas where we think we have the facts but don't.

B. Facts

1. Facts - World trends in poverty, nutrition and food staples, 1960-2010

1. A reduction of over two-thirds - more than in all previous human history - in the proportion of people who are absolute, severe consumption-poor (here called **absolute poor**): those consuming below $1.25(2005PPP) /person/day. In the early 1960s these absolute-poor were almost certainly over 66% of people in developing regions (Asia, Africa, Latin America and eastern Europe). In 1981 the proportion was 52%; in 2008, 22%.[3] In India, $1.25 poverty incidence halved, from 66% to 33%. Poverty *gaps* - their average shortfall below the $1.25 poverty line - also fell substantially, e.g. in India from 23% in 1978 to 7% in 2010.[4]
2. Similar, but slower, falls in malnutrition due to deficiency (mainly stunting and wasting [energy (kcalorie) deficiency], anaemia [iron deficiency], impaired vision [vitamin-A deficiency], and goitre, etc. [iodine deficiency]. The incidence of significant underweight (>2SDs below NCHS standards) among under-fives in developing regions was well over 40% in the early 1960s, and fell from 29% in 1990 to 19% in 2007.[5] Improvement was rapid in China, slower in India, and almost absent in sub-Saharan Africa (SSA).[6]
3. Unprecedented increases in staples productivity (especially yield), output, and probably shares of output traded *within* nations, but not *among* them.
4. These three trends were strongest in developing areas (especially Asia and above all China). However, SSA has largely missed out on all three trends.
5. A fourth, unwelcome *global* trend was burgeoning malnutrition due to excess (obesity because calorie intake exceeds requirements) - and hence diabetes (also linked to excess sugar), heart disease (also linked to excess fats, especially animal and transfats) and cancer (with many triggers involving excess nutrients).

2. Facts - Malnutrition depends substantially, but not wholly, on poverty, via food staples

Undernutrition: The absolute poor devote about half consumption, by value, to staples (and over 70% to all foods). 70-80% of their kcalories, and most micronutrients, come from staples; the proportions fall sharply - i.e. diets are diversified - as income rises. Most absolute poor work on farms - mainly (except in Latin America) their own, but partly their employers' - and over 70% are rural. Poverty is much more responsive to agricultural growth than to growth in other sectors.[7] And when staples yields rise, most of the poor - still, farmers and farm labourers - normally get more labour-income and eat more, unless land is extremely unequal *and* farming inappropriately capital-intensive. *Low staples output and productivity is a major cause of poverty and hunger.* As Sen[8] implies, that is mainly because low staples output reduces the poor's food entitlements (rather than because too little food is available): low staples output per person means low income for the poor, high local prices, and hence low food entitlements for the poor, and undernutrition.

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[3] S. Chen and M. Ravallion, 'More relatively-poor people in a less absolutely-poor world', Policy Research Working Paper #6114 , Development Research Group, World Bank, July 2012: Table 2; and World Development Report 1990, World Bank, 1990, Table 3.2.

[4] http://www.indexmundi.com/facts/india/poverty-gap Indexmundi, also for other countries and for http://www....poverty-headcount-ratio, all from World Bank Development Research Group. Other poverty-gap data: China 39%-3% 1981-2008; but Kenya 15%-17% 1992-2005; Nigeria 22%-34% 1986-2010.

[5] UN SCN, Progress in Nutrition, 6th Report on the World Nutrition Situation, New York, 2010: Table 21 & Fig. 9. Other indicators show similar trends.

[6] In China underweight for children aged 0-3 fell from 19% to 7% in 1987-2002; in India, for children aged 0-5, only from 44% to 42% in 1998/9 to 42% in 2005. In SSA, falls were negligible: of 42 countries with a post-2000 and an earlier survey of proportion of children underweight, 18 show at least a 2% fall, 14 at least a 2% *rise*, and 10 no change (in Asia, with 25 national repeat surveys, comparable numbers are 14, 1 and 10). Of 29 African repeat national surveys of child stunting, 12 show improvement, 11 deterioration, and 6 no change (Asia 20: 13, 1, 6) [UNSCN: 8-9, tables 21-3].

[7] A. de Janvry and E. Sadoulet, 'Agricultural growth and poverty reduction: additional evidence', World Bank Research Observer 25 (2010), 1: 1-20: 'GDP growth originating in agriculture induces income growth among the 40 percent poorest [about] three times larger than growth originating [elsewhere]'.

[8] A.K. Sen, Poverty and Famines, Oxford, 1981.

Thus, despite the poor's huge concentration of consumption and income on food, poverty causes most undernutrition, measured by wasting and stunting. These are worsened by food-disease interactions: the poor (a) cannot afford enough good food, (b) live in conditions that increase exposure to malaria and dysentery. As people escape poverty, they reduce exposure to dysentery and food shortage as best they can. Yet, though poverty has plummeted since 1960 except in Africa, the persistently bad health environment of low-income groups means that undernutrition (outside East Asia) has declined less sharply.

Overnutrition: this has also exploded, even in middle- and low-income countries and groups. It is, perhaps surprisingly, also linked to poverty, partly via food staples. Poverty is the main cause of undernutrition of under-fives , and this helps cause *over*nutrition later. Undernutrition selects children who need less food to survive, but keeps them small; and children's hunger can impair adult immune response. When the nation develops and children reach working age, they often move to urban work, with better income but less movement, more crowding, greater need for energy-dense snacks, and displacement of high-fibre staples by fattier animal foods. All this *may* help explain why early undernutrition is linked to increased risk both of infection in middle age (Prentice's Gambia long series) and to diabetes and heart disease in old age (the Barker hypothesis). In any case, while overnutrition in poor countries starts among the affluent, it soon comes to be associated with poverty.[9] Food staples are implicated as, when incomes rise, staples use shifts from direct human consumption to consumption 'filtered' via meat and dairy products. This not only shifts consumption towards less fibrous, fattier foods, stimulating *over*nutrition, obesity and disease. Also, farm animals hugely raise demand for staples and hence staples prices (mainly because producing 1000 human kcalories via meat/dairy uses 5-7 times more land than via staples eaten directly as cereals, roots or tubers). That also cuts entitlements for consumers and increasing *under*nutrition among the poorest.

Thus - while a normal accompaniment of rising income, and a source of dietary diversification and pleasure - the shift of staples toward farm animals, carried to the extent that has been experienced in the past few decades, is a main cause of both undernutrition and overnutrition and the diseases of affluence. The "double *burden*" of low-mid-income countries, undernutrition and its diseases alongside overnutrition and its diseases, is not a double *problem*: it is a single problem of policy for, or against, staples and subsistence farms.

3. Facts - the extent of subsistence

"Of the [world's dollar-poor], the vast majority are small farmers, who rely in a combination of self-provisioning and market sales'.[10] Yet, amazingly, for most developing areas there are no estimates how much total, food, staples, or grain output is retained for consumption by the farm.

- In Russia in 2003-5, 66% of families grew for subsistence, producing *over half farm output by value* (on only 3% of the land, mainly because large farms left so much fallow). 87% of these families derived no cash income, i.e. farmed only for subsistence. However, except potatoes, most main staples (wheat, barley, oats, rye) were grown on agricultural enterprises, not small farms.[11]
- In Uganda in 2005-6, 42% of total farm output and 54% of food output was retained by growers.[12]
- Tanzania's 2002-3 National Sample Census of Agriculture estimated that 69% of cassava was retained.
- In Orissa state, India, of the main staple (paddy rice), 35% was retained by growers.[13]

All these numbers, though large, underestimate production for subsistence, because they measure it as output minus gross marketed surplus. Ever since Narain's pathbreaking work in India,[14] it has been known that small "subsistence" farms, having sold much of their staple crop after harvest, buy it back steadily until the next harvest. I'll ask why this happens later. The point here is that the proportion of output that a family farm produces for subsistence is much higher - typically perhaps 10-30% higher - that the proportion it *retains*. The other side of this story: the fact that a farm eats most of what it grows doesn't mean that it does not sell much of it after harvest, so it has cash to buy fertilizers and other things. Small subsistence farmers trade!

C. Staples production-trade by subsistence/deficit farmers, "commodification" and malnutrition

1. Production

[9] C. Monteiro, E. Moura, W. Conde and B. Popkin, 'Socioeconomic status and obesity in adult populations of developing countries: a review', WHO Bulletin, 2004:82(12): 040-946.
[10] J. Quan, 2007: 'A future for small-scale farming', SR25: Foresight Project on Global Food and Farming, Govt. Office for Science, London.
[11] The socioeconomic and cultural significance of food gardening in Vladimir region, Russia L. Sharashkin, D. Phil.,U Missouri–Columbia, 2008.
[12] D. Kraybill, B. Bashaasha & M. Betz. 2012, Production and Marketed Surplus of Crops in Uganda, 1999-2006. USSP 08, IFPRI, Kampala.
[13] A. Anmarinder Reddy. 2009. Factor Productivity and Marketed Surplus of Major Crops in India: Orissa. Hyderabad: Administrative Staff College.
[14] D. Narain. 1962. Distribution of Marketed Surplus by Size-level of Holding in India, 1950-1. Bombay: Asia.

Rapid rises in staples productivity almost always reduce undernutrition where they happen, partly by keeping local staples prices down, partly by providing income from work (employment or self-employment) for the rural poor - still a large majority of poor people. Both these paths - from higher staples productivity to lower poverty and undernutrition - are usually most effective if staples *yields* rise mainly on smallholdings, and by means that generate extra demand for labour rather than equipment.

2. Trade

While a subsistence buffer has many advantages - and, as we shall see, does not impede food trade - for villages to farm *only* a staple, for subsistence, doesn't promote development. Trade assists specialization and affluence, permits dietary diversification, and helps smooth consumption between times of good and bad harvest. That even shows up in the effects on undernutrition: with similar income, villages specializing almost wholly in *either* staples *or* non-staple cash crops experience significantly more undernutrition than villages with significant plantings of both.[15]

3. "Commodification"

Are poor people, subsistence farmers, staples productivity, and nutrition helped or harmed when food is "commodified"? Many people are unhappy that certain things are "commodified" - turned into items valued only, or almost entirely, for their cash returns when traded or exchanged. Nobody minds if a chess set or a jar of caviar is commodified. However, most people agree that life, for example, should not be treated like that: it is a duty to assist a wounded person if one can, even if there is no reward. So what about commodification of essentials to life: food, health care? There is legitimate controversy about the extent to which profit motives in pharmaceuticals, hospital space, or doctors' services makes it more or less likely that care for the sick and wounded will be available, and of high quality, when needed.

On some accounts, food is normally commodified as humans 'develop'. Human food started by being hunted or (much more usually) gathered by each small kin-group for its own use. From about 7500-5000 B.C., food was farmed increasingly by settled agriculturists - initially almost everyone, mostly small farmers, feeding themselves; but, with development, dwindling numbers of mainly large-farmer specialists, trading staplers and other farm products to others engaged in industry and services. In this evolutionist approach, subsistence farming does and should evolve into trade by a much smaller group of commercial farm specialists. Quan cites a standard model of transition from "Rural world 3" ("Farmers ... primarily self-provisioning") to "Rural world 2" ("Small farmers are primarily local market oriented, diversified and adaptable, with ... some self-provisioning with varying degrees of market engagement"), to the modern "Rural world 1", with commercial farming, but even small farmers "globally competitive, embedded in agribusiness, commodity producers and processors ... export driven, adopters of Green Revolution and transgenic technologies ... highly market integrated for both staple and higher-value cash crops".[16]

D. So why not squeeze out subsistence?

1. The model and the mistaken inference

From this model, much development policy derives goals of squeezing out subsistence farming. For instance, Uganda's Poverty Eradication Action Plan aims to cut the retained proportion of farm output from 80% in 2002/3 to 30% in 2013/14.[17] This model sees "subsistence" - families feeding themselves - as the enemy of development, and the replacement of small subsistence farmers by large food-selling farmers as evolutionary, normal and desirable. "Subsistence" farming is seen as an increasingly "inefficient" use of resources as countries develop. Its reduction is seen as a natural process, to be accelerated by good policy.

This is, in crucial respects, completely wrong. What is wrong is NOT the perception - inherited from Adam Smith - that specialization and trade are keys to "the natural progress of opulence" and the retreat of poverty.[18] What is wrong is to infer that, because trade and specialization are desirable, subsistence staples farming is the enemy: backward, inefficient, reactionary, to be driven out. This is wrong for five reasons.

(1) The account of food commodification/trade/exchange as the rival of food self-consumption or subsistence, bound to drive it out, is empirically false. Often, subsistence is efficient, and then it is the ally of trade and spe-

[15] Schofield, S. 1979. Development and the Problems of Village Nutrition. London: Croom Helm.
[16] Quan 2007, citing Vorley.
[17] Kraybill et al 2012.
[18] It is less clear that governments should *subsidize* trade, e.g. through free roads, in countries with almost no irrigation, or farm capital or research.

cialization, even of commercialization - not their enemy. Often, too, subsistence is linked to household food security, and thus the base from which less-affluent farm families trade more.
(2) Small-scale family farming, including and perhaps especially subsistence farming, slashes the cost of managing the work process. This saving of *transaction costs* makes such farming a more "efficient" use of resources - and of higher land yields - where labour is plentiful and capital scarce.
(3) Small, "deficit" and subsistence farms are just as "commercial" as big farms, only smaller.
(4) The story of staple foodstuffs - and the gains and losses from shifts between subsistence and trade - is different from the story of other foods, in ways favouring subsistence farming.
(5) The global retreat of mass poverty since 1960 - alongside burgeoning inequality since 1980 - has shifted populations into three groups: the ultra-rich 1-5%, the adequately-off, and a dwindling but persistent core of poor. Only the last group *normally* does not eat quantities and qualities of food needed for a healthy life. Poor populations suffer caloric undernutrition and micronutrient and sugar/fat malnutrition in low-income countries; caloric overnutrition and sugar/fat malnutrition in high-income countries; and both in middle-income countries, and in low-income groups as they become better off. More surprisingly, especially in poor bur fast-growing countries, poverty and undernutrition in early life conduce to diseases of *over*nutrition in later life. All this makes a new case for small-scale subsistence staples farming.
What do these five points say about the interplay of staples production, commodity exchange, and poverty?

2. Subsistence farms trade!
The standard picture - commercial farming with trade as an alternative to tradeless subsistence farming, destined to drive it out - is wrong. Commercial and subsistence farming have three other relationships, based on the fact that most subsistence farms grow less staples than their family needs, and must fill the gap.
(i) In India in 1950-1, many farmers sold most of their grain soon after harvest, to pay off loans - then bought back the grain over the year, as needed (fn. 14 above). India has been transformed since 1950-1, but this remains true. Subsistence farmers need loans well before harvest, to buy consumer goods, but also, increasingly, farm inputs. Far from evolving *from* subsistence to trade and green revolution, hundreds of millions of Asian subsistence farms trade *to obtain* green-revolution seeds and fertilizers. Indeed, the smaller a farm, the more, normally, is its annual per-hectare fertilizer use - and output (fn. 22).
Such grain sales and buybacks bring problems. First, transport is costly and risky. Second, losses of staples in transport, and in large (especially public) grain stores, dwarf the storage losses of staple foods in small farm households - which, contrary to myth, are small, typically below 5%.[19] (Indeed, these extra losses are part of the hidden cost of the passage from subsistence, especially if artificially accelerated in advance of provision of efficient storage and other post-harvest arrangements, whether market-driven or State-led.) Third, staples transport and storage costs are paid, plus profit, to food traders by subsistence and deficit farmers - usually poor. Yet such farmers can often finance year-round consumption, and purchase of key Green Revolution inputs only by loans linked to post-harvest staple-crop sales.
(ii) Households mainly farming staples, but still in staples deficit, enter into trade in other ways. They grow crops like vegetables, cotton and coffee, and sell them to buy staples and farm inputs. They trade by using non-farm income, typically 30-40% of subsistence farm household income[20] (from non-farm enterprise and off-farm activity, including work on other people's farms, often paid in kind). And they trade by using remittances from relatives, rural as well as urban and international.
(iii) Deficit farmers, while commercial and trading, are poor, food-insecure and risk-averse. Higher food production-for-consumption *raises* their readiness to trade, by reducing their poverty and food insecurity. A bad harvest, health costs, twins, sharp rises in the cost of net food purchases, mean discomfort instead of disaster. This reduction in "existential risk" - at worst of starvation; at best of forced sale of land or animals, depleting future production prospects - makes poor farmers more willing to take other risks: to trade, to seek out markets, to innovate with new techniques, to try new crops, staples and others. With more, and more secure, staples production for subsistence, a poor farm family's staples (and other) marketings *rise*. Again the crude, static arithmetic of "more subsistence means less trade and development" fails.

[19] R. Boxall, 1991, 'Post-harvest losses to insects: a world overview', at http://www.aseanfood.info/Articles/11014662.pdf (in fact treating all sources of loss) cites 9 careful farm studies showing 'losses ... contained at about 5% or below over the storage season' and explains the huge prevalent overestimates. For confirmation see M. Greeley, 1978, ' Recent Indian experience with farm-level food grain storage research', Food Policy, 39-49; R.Boxall, M. Greeley & D. Tyagi. 1979. "The Prevention of Farm Level Food Grain Storage Losses in India," Bulletin of Tropical Stored Products Centre, 37: 11.
[20] S. Haggblade, P. Hazell and T. Reardon. 2007. Transforming the Rural Non-farm Economy: opportunities and threats. Baltimore: Johns Hopkins.

A subtler effect involves price risk. Wealthy staples-farming households, almost all their staples output and buying mainly non-staples, are worried about risk of *lower* prices of *sold* staples; this induces them to grow *less* (and buy fewer fertilizers and other inputs) per hectare. Poor, staples-deficit farm households are worried about risk of *higher* prices of *purchased* staples; this induces them to grow *more*, and buy more farm inputs, per hectare.[21] So subsistence farms, even in maize near-monocultures as in Mozambique, may grow more than big farms.
So "subsistence" and deficit farmers are "commercial" - not only profit-motivated, but also engaging in substantial sales, which permit substantial purchases, including farm inputs. The crude arithmetic of "more self-consumption means less trade", so subsistence and staples trade are enemies, is wrong.

3. Subsistence, family, and smaller farms *in poorer countries* are efficient, often dynamic

In *capital-intensive, labour-scarce rural regions*, big commercial farms increasingly rent in, buy, and displace small semi-subsistence farms. In much of North America, W Europe and Australia this is desirable. That's not because big farms have significantly lower unit *production* costs. It's because they have lower *transaction* costs (per hectare and per unit of output) in borrowing and managing capital equipment.
The opposite logic works in *labour-intensive, capital-scarce rural regions*: most of rural Africa and Asia and much of Latin America and Russia. There, it is small farms that have lower unit transaction costs (per hectare and per unit of output), due to cheaper search, screening, training and supervision of their largely family labour. That's why in these areas successive Censuses of Agriculture, each decade from the 1970 round to the 2010 round, show a market-led drift (sometimes supported by land reform) to *smaller* farm size, alongside small-farm green revolutions in many cases. In such areas, the reversal of this drift to smallness, and artificial stimulation of shifts from subsistence to big farms - e.g. by land grabs, often non-consensual, ill-managed, untransparent or corrupt - make for inefficiency. Such land shifts reduce demand for labour. With workforces increasing at over 2% for decades - and non-farm development that has failed to stem unemployment - anti-subsistence is socially harmful too.[22]
As compared with large-scale commercial farms, small-scale family farms, including "deficit" and subsistence farms, slash cost (per hectare and per unit of output) of managing labour, but raise cost of acquiring and managing capital. In low-income and many middle-income countries, this means that small-scale, including subsistence and deficit, farms have lower unit transaction cost, i.e. are a more "efficient" use of resources where labour is plentiful and capital scarce. Nor are subsistence farmers sluggards: in many countries they have enthusiastically adopted irrigation, fertilizers, and radically improved seeds.
Two caveats. First, as development proceeds, the labour-supervision advantages of small, family and subsistence farms loom less large, and the capital-management advantages of large farms loom larger. But the stronger political position of bigger farms mean that such trends will be recognized, probably too soon, in land acquisitions: state support for farm enlargement is the last thing needed, especially given the power of large units (and the weakness of small and poor farmers) to lobby and to corrupt.
Second, small farms, including subsistence and deficit farms selling post-harvest for later buyback, are often claimed to have major disadvantages in dealing with processors, supermarkets and export markets, not least for staple foods. This is a huge issue, but there are plenty of cases where bulking-up, marketing co-operatives, and intermediation have allowed small farms to deliver competitively to large processors, traders and supermarkets, each with lower unit transaction costs in its own sphere (see below).[23]

4. Trading plus efficient equals commercial

It is obvious that, if subsistence and deficit farms are efficient resource users and enter substantially into trade, they are commercial. The common distinction between "subsistence farmers", to be wound down, and "commercial farmers", to be stimulated, is little more than a lazy group libel on subsistence farmers.

5. Subsistence and staples

The data for crop-mix on subsistence and other farms are scrappy, but in most of Asia and Africa the bulk of staple foods is still grown on subsistence, often food-deficit, farms, including urban farms. Yet such farms' competitive advantages are due to labour-intensity. So one would expect concentration on high-value horticulture, especially vegetable crops, where yields can be sharply raised without much capital. And there are many cases - from

[21] T. N. Srinivasan 1972, 'Farm size and productivity: implications of choice under uncertainty', Sankhya 34 (B), 4:409-20; C. Barrett 1996, 'On price risk and the inverse size-productivity relationship', J. Devel. Economics 51:193-215.
[22] M.Lipton, Land Reform in Developing Countries: property rights and property wrongs, London: Routledge 2009; R. Eastwood, M, Lipton and A. Newell 2010, 'Farm size', in Handbook of Agricultural Economics, 4: Agricultural development, farm policies and regional development:3323-3394.
[23] See Lipton 2009:87-91, and numerous papers by Tom Reardon and his colleagues referenced there.

Russia, via Ghana and Kenya, to Indonesia and Sri Lanka - of widespread, competitive vegetable production by tiny farms (often called "home gardens"). Where such farms are in or near big towns, the vegetables are grown mainly for sale; elsewhere as supplements to nutrition. In either case, even a small home garden is associated with significant nutritional improvements.[24] A widely implemented 'homestead food production' package of 'home gardening, [poultry/pig] production and nutrition education ... improved household food production and diet quality' in several developing countries, notably Bangladesh, compared to control groups without the package.[25] However, the impact is mainly on caloric adequacy and food security, rather than on micronutrient status. Probably, the poorest cannot afford to keep the vegetables and chickens for diversity and nutrients, but rather sell them to get closer to caloric adequacy.

Should micro-farmers grow staples for direct calories, or higher-value vegetables for sale? High vegetable yields from labour-power are often found, making tiny holdings highly competitive - given the right technology, seeds, fertilizer or manure, water control, and nearby markets. All these, especially markets, are often missing or unreliable in remote rural areas, so the rural subsistence micro-farmer often grows mainly staples. They are commoner in densely populated areas, including towns. There, too, high land values make staples an unlikely long-term land use. Yet, from Kinshasa to Addis and Nairobi, tiny family patches of grains or even cassava spring up on almost any patch of unused private, or claimable, land with nearby domestic water or waste. The rural, and urban, poor are desperately concerned for staple food security, especially with rising or gyrating prices. Reducing food insecurity - by agrotechnical progress in staples and by land reform - will greatly reduce poor farmers' aversion from risk, and raise the share of non-staples in their crop-mix.

The absolute poor get 70-80% of calories *and most other nutrients* from staples (proportions that fall as poverty recedes). So poor farmers prioritise food "subsistence" in the case of staples, delaying full commodification - farming for pure profit, and so shifting from staples to higher-value products - until food security improves. The very poor and food-insecure seek staples first. As we saw this does not impede commercial, efficient, trading behaviour, but it limits the spread of such behaviour across farm practice. Also agro-economic best practice often dictates *rotating* staples with pure cash crops like cotton, or *mixing* them with crops like beans. Such farmer good sense influences farm policy, especially on research, much less than it should.

6. **Inequality, nutrition and the case for expanded subsistence**

The final, and most obvious, reason why it is wrong to squeeze subsistence production, and producers, is equity. Such policies probably worsen absolute consumption poverty and increase polarization.

Absolute poverty incidence (consumption< $1.25PPP/person/day) has plummeted since 1960 (except in SSA). Yet in 2008 over 1.1 billion people were absolute-poor - 49% in two vast, fast-growing economies, India and China.[26] Probably over 80% of the poor are rural, but deficit sub-subsistence farmers are heavily over-represented among the rural *and urban* absolute poor. As they get less poor, they diversify away from such farming. However, meanwhile, policies to shrink it - for example by shifting land into larger farms, or concentrating research upon their priorities - will harm the poor, except on far-fetched assumptions.

Squeezing subsistence farming also increases the vulnerability of the poor, who are much affected by recent uptrends, and increased fluctuations, in the price of their main food staple. To the extent that they produce for subsistence, they are much less vulnerable. Furthermore, subsistence farming interacts strongly with land equality to benefit the poor: where farmland is very equal, even poor subsistence farmers normally have a surplus for sale, so poverty may actually decline when food prices rise - as in Vietnam[27] and probably China, which have experienced egalitarian reforms of land into small family farms, but not elsewhere.

In many countries, the plummeting of poverty sits alongside a huge rise in the income shares of the richest 10%, and especially the top 1%. This implies polarization. Middle-income groups are losing out, both to those above and to those below. This reduces the power, and the will, of the 'squeezed middle' to relate positively to either the rich or the poor, let alone to mediate politically between them. Thus polarization increases social distance and

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[24] Home Gardens in Nepal, ed. R. Gautam, B. Sthapit and P. Shrestha, UN-SCN 2006, esp. pp.101-3. In Lesotho there was 'significant association between the presence of home gardens and lower incidences of wasting and underweight, though 'nutritional status of children in households with or without home gardens in sampled areas is poor" (L. Makhotla and S. Hendriks, 'Do home gardens improve the nutrition of rural pre-schoolers in Lesotho?' Development Southern Africa 21:2004:575-81).

[25] L. Iannotti, K. Cunningham and M. Ruel, 2009, 'Improving Diet Quality and Micronutrient Nutrition: homestead food production in Bangladesh'. Washington, DC: IFPRI Discussion Paper 00928.

[26] http://siteresources.worldbank.org/INTPOVCALNET/Resources/Global_Poverty_Update_2012_02-29-12.pdf; Sumner, A. (2012) 'Where do the world's poor live? A new update', Working Paper 393, Brighton: Institute of Development Studies.

[27] M. Ivanic and W.Martin (2011), ' Short and Long-run Impacts of Food Price Changes on Poverty', World Bank, 10 December (esp. p.7); --- and H. Zaman (2011), 'Estimating the short-run poverty impacts of the 2010-11 surge in food prices', World Bank Policy Research Working Paper Series 5366.

damages social coherence. Widespread subsistence farming among many people - middle-income as well as poor - still exists in China, Russia,[28] Africa, and parts of South and East Asia, but is almost everywhere being squeezed out by land grabs, policies on agricultural research, and - perhaps above all - an ideology that subsistence farming is reactionary and should be squeezed.

E. Policy

The overriding policy lesson is that, in low-income and lower-middle-income rural areas, subsistence farming, especially of food staples, should be celebrated and helped, by appropriate policies, to become high-input and scientific - not, as too often, mocked, denigrated and squeezed out. There are at least six reasons. First, subsistence farming is still a main source of nutrition, food security, income stability, employment and income - e.g. in SSA for over 60 per cent of families, and perhaps 75% of the absolute poor. Second, subsistence farming cuts post-harvest transaction cost of staples output, mainly by reducing requirements for there-and-back trade (with its associated transport and storage cost and loss, and necessary intermediation). Third, since subsistence production is mostly on small, family farms, such post-harvest economies are *additional* to such farms' generally lower unit transaction costs of labour in production. Fourth, especially with appropriate provision of public goods - above all those facilitating modern scientific farming methods - improved farming of staples for subsistence is not an enemy of specialization and trade, but a catalyst for them. Fifth, despite considerable land inequality in some cases, much of S and E Asia's green revolution in staples production - and much of the subsequent shift to higher-value, traded farm products - started and has been sustained largely on family, subsistence farms; this has induced unprecedented growth and industrialization in the surrounding economies: it can be done. Sixth, the alternative mainly large-farm development path amid extreme land inequality, as in most of Latin America, largely due to much higher land inequality, has had much less favourable impact on poverty, and on aggregate economic growth: the alternative strategy has seldom worked well. Seventh, binding all this together, is the key issue of employment: rural and urban unemployment has been much more severe and persistent in countries neglecting agriculture, or adopting large-farm strategy, than where green revolutions have been sought mainly via small/subsistence farms.

Which path will SSA governments choose? In the 21st century, many are shifting priorities towards agriculture, which by global standards they had neglected, under-financed, or even sucked dry. Lead African institutions such as CAADP and AGRA, in the light of experience globally, are committed to smallholder-led paths based on scientific farming and institutional change. However, initial power-holders in many countries oppose that path, instead favouring severe land inequality and even land grab. A powerful tool for such power-holders is to present this, however misleadingly, as an economically sound and progressive strategy - and to denigrate "subsistence" farming as scientifically backward scratch-a-patch. The reality is that Asia's accelerated development started with policies to ease subsistence farmers' access to farm science, better seeds and fertilizers; and that the very low availability of these to Africa's subsistence family farmers underpins Africa's its still sluggish development.

We know the main requirements of small/subsistence-farm-friendly policy for farm water, fertilizer access, seed research, trade, education, health, rural public goods, and *sometimes* rural financial services, including risk management. We also know the dangers of policies unduly, or too long, based on subsidy rather than investment. I list five less familiar areas where policy improvement can help subsistence farmers to advance with science and trade.

1. <u>Improve staples output and employment data, especially for subsistence farms, for better policy to them</u>
(a) To make sensible farm policy, a government needs some idea of **levels and trends of farm output** for main products and regions. Reasonably accurate data have been available for India, Pakistan and Bangladesh for about seventy years, and much the same applies in China and much of the rest of Asia (though data for minor and mixed crops, so important for many subsistence farms, are weak or absent). However, for some decades, no remotely reliable data for subsistence, small-farm, non-internationally-traded staples production - and, to a substantial extent, for smallholder output altogether - have been available, nationally or regionally, for most SSA countries - including, among the largest, DR Congo, Ethiopia, Nigeria and Sudan. (Data reported to FAO do not, in these cases, rest upon *properly collected and supervised* crop-cutting samples or post-harvest farmers' reports). Is a policy improving production, locally or nationally? If production levels (let alone trends) are unknown - or, worse, if

[28] Sharashkin (2008), op. cit.

there is an illusion of knowledge - agriculture-related policies on technology, prices and institutions cannot be assessed. (Micro-studies can help, but cannot replace knowledge of output effects and trends nationally).
Since the very few available studies suggest that smallholder/subsistence production is 30-70 per cent of farm output in much of SSA - and since levels and trends of such output are usually unknown - policy success and need cannot be properly evaluated, so correct policy choice is unlikely. Information, and therefore policy impact on output, are weakest for small subsistence farmers: output of traded cash crops from large farms is usually known more reliably, so policies affecting such output can be evaluated, and changed if (and only if) appropriate.
(b) Absent such macro-data, micro-studies (very seldom random samples) can hint at the **share of output grown for subsistence**, or the gross and net marketed surplus. But such studies exist only in a few countries, and there only for some crops, years and seasons. If policy impacts vary for subsistence and large farms, therefore, the balance of appropriate policies (and their distribution as well as production impact) cannot be properly assessed. This must shift policies and expenditures away from the unknown - including crops mainly cultivated for subsistence; but that balance is not due to knowledge of what policies work, but to ignorance about subsistence production.
Unfortunately we cannot usually guess at the size or even direction of bias around the casually reported official numbers for staples output (let alone subsistence share) in most of SSA, though we know that they understate year-to-year fluctuation. Farmers' reports of output are fairly reliable,[29] but *only* if gathered 3-6 weeks after harvest by properly trained, supervised and incentivized investigators using locally calibrated weights and measures.
(c) Policies to strengthen farm output data have long ago largely succeeded in most of the developing world; such staff - for data collection, processing and use - are a pre-requisite. However, in many fiscally hard-pressed (and often urban-biased) countries of SSA, the *national* commitment, whether to agriculture or to statistical information, required to embed such staff into a national system, has been absent.
(d) Many data in sub-Saharan Africa, relevant to policy for subsistence farms, are good or rapidly improving: land use data, as satellite imaging increasingly complements agricultural census; food consumption and poverty data, from LSMS and its successors; demographic and health data, from DHS. However, for the huge subsistence sector, data on inputs - especially non-market ones, including family labour - are as weak as for outputs: the Nigerian official estimate of proportion of workforce mainly engaged in agriculture around 2007 is 27%, but USDA and World Bank estimates are *double* that! SSA-wide estimates are typically around 70%, and "careful field surveys in 15 SSA countries suggest, contrary to received wisdom, that proportions of young workers are even higher".[30]

2. <u>Screen major public decisions for impact on subsistence farms, especially in staples, and act accordingly</u>
Public *investments*, *policy*, and *incentives*, not mainly aimed at subsistence staples farming, can much affect it.
Investments in transport, especially roads (usually free to use), often imply big subsidies to trade, i.e. to *non*-subsistence: the further the product is transported, and the higher its ratio of weight to value (and thus, usually, of transport costs to production costs between a given source and destination), the greater the trade subsidy. This is a hidden penalty for subsistence production, and of production for local use - especially of staples. That is not to denigrate road investments - much needed in parts of SSA to ease market access and economic and political integration - but to point out that their 'backwash effects' on subsistence farmers, especially in staples, should be (a) evaluated and deducted from benefits when estimating benefit/cost ratios, (b) compensated to the losers - who are also taxpayers, and poorer than most - with appropriate changes in other policies.
Policy: China and many other countries have successfully stimulated exports through export processing zones, usually coastal. Such stimuli usually (not always) on balance harm other lines of production, especially non-traded goods such as subsistence staples. Again, this is not to condemn EPZs, sometimes a very valuable policy tool, but to request pre-assessment of their backwash effect on subsistence farms, and compensation if indicated.
Incentives: After decades of agricultural neglect and exploitation - and mainly subsequent (but overlapping) decades of sometimes undiscriminating war against all agricultural subsidies - SSA is moving towards selective subsidies, designed for "smart" avoidance of misdirection and leakage, and seeking to spread new and promising farm inputs, especially (as in Malawi) fertilizers.[31] Given SSA's extremely low fertilizer use,[32] such kick-starting may well be right in many cases, but tends to discriminate against farmers with little cash (or cash crops), water

[29]In five African countries, they got at least as close to whole-field harvests as did crop-cut samples with similar outlay: V. Verma, T. Marchant and C. Scott (1988), 'Evaluation of crop cut methods and farmers reports for estimating crop production'. London: Long-acre Agricultural Development Centre.
[30] M. Lipton (2012), 'Learning from others: increasing agricultural productivity for human development in sub-Saharan Africa'. WP 2012-007. New York: UNDP Regional Bureau for Africa), Table 2 and p.6.
[31]A. Dorward and E. Chirwa 2011. 'The Malawi agricultural input subsidy programme: 2005-6 to 2008-9' <u>Internat. Jnl. Agric. Sustainability</u> 9: 232-247.
[32]In 2007 10kg/ha of NPK, below 5% of S, SE and E Asia: http://faostat.fao.org/site/575/DesktopDefault.aspx?PageID=575#ancor

control, or capacity to bear risk. Careful planning, as in Malawi, can mitigate these dangers; otherwise the programmes become not kick-starters but permanent support for richer farmers against "subsistence" competitors.

3. Release some areas likely to be used for subsistence farming

(a) Home gardens are close to home labour, water and kitchen waste. Small ones, especially, show very high value-per-hectare. Often, apart from stimulating subsistence farmers to "spread their wings" and trade in local vegetable markets, they significantly raise subsistence staples output. Policy can increase area in home gardens? Governments should be readier to release superfluous public lands, especially for the poor. Joint villager action can be stimulated to develop cultivable waste, standpipes, and compost pits. Often, such land redistribution has proved feasible where larger-scale land reform was not, and has reduced poverty and malnutrition.[33]

(b) Much of SSA has the advantage (as did most of S and E Asia) that agriculture is mainly in smallholdings: farmland is not very unequal. This, in part, accounts for the big role of subsistence staples farms. These are the main source, especially for the poor, of employment, calories and income; and small family farms generate each unit of these with less capital than alternative activities, and with less land than large farms. So governments should refrain from undermining small-farm systems, until adequate and economic alternative sources of food, work and income are available. 'Land grab' in sub-Saharan Africa should be judged on that criterion: favourably if fairly negotiated with small subsistence farmers, and enhancing their control over area and productivity, e.g. with carefully considered contract farming, nucleus estates, or tenancy-crop purchase arrangements; unfavourably, if new owners destroying informal traditional tenures not after fair negotiation but through unmandated government action, or replace employment-intensive subsistence farms by capital-intensive large farms.

A few "settler economies" in S and E Africa start with very unequal farms. In such cases - given worldwide evidence of small family farms' major advantages in labour-management - careful but substantial redistributive land reform is efficient[34] and equitable, and (as proven worldwide) can be politically feasible. At first, land redistribution raises the proportion of output used for subsistence, cutting transport and storage costs. Must this reduce the flow of staples to the towns? This need not be the case, and sometimes does not happen, because land redistribution normally also increases both output per hectare, and the proportion of it comprising staples.

4. Help smallholders to exploit forward linkages to new(ish) routes to processing and marketing

Some claim that post-harvest advantages of large scale - for processing, storage, containerization, meeting national or international "grades and standards", supermarket sales, and export horticulture - increasingly swamp the on-farm advantages of small/subsistence producers. This claim neglects history, theory and contemporary reality. Historically, it has long paid large growers to sell post-harvest services to small ones, from milk processing in India to tea-factory processing in Kenya. For centuries Asian traders, large and small, have bought many million tons of staples every harvest, to re-sell them (often to the original growers!) in the slack seasons.

Theoretically, where micro-sellers face lower unit *production or transaction* costs but higher unit *sales/processing* cost, if it pays neither buyers nor micro-sellers (even co-operatively) to link to each other, it will normally pay an intermediary to provide processing, storage or other links, as has almost always been the case for crops such as rubber and sugar; the same should apply to bulking-up for supermarket transport.

In contemporary reality, there are many successes by micro-farmers in selling crops (including such staples) to modern grades and standards; liaising with supermarkets; and exporting horticultural products (see above, fn. 23). There is huge variation among, and even within, countries (and crops) in respect of small/subsistence farmers' success in accessing modern market outlets. State action can help, but may not; for example, India's 'regulated markets' have long eased the path of subsistence newcomers into fruit and vegetable marketing in Maharashtra, but not in Orissa. It is worth screening policies on transport, inspection and, regulation for their impact on this.

5. **Consider special policies for the marginal/subsistence/small-deficit sector**

In many respects, what is good for small farms is good for subsistence and deficit farms. (For example, it is larger farmers who gain most if seed research seeks to maximize economic yield with no regard to risk.) However, it should not be *assumed* that the same policy set benefits these five overlapping sets: small, family, subsistence, sub-subsistence and deficit farmers. This caution applies especially to policies on credit and micro-finance.

[33] R. Mitchell and T. Hanstad 2004. Small home garden plots and sustainable livelihoods for the poor. Seattle: Rural Development Institute, for FAO.
[34] Lipton 2009, ch. 2.