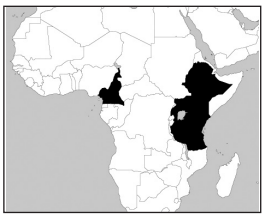

Cities feeding people: an update on urban agriculture in equatorial Africa

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ABSTRACT For several decades, a diverse literature has claimed that urban agriculture has the potential for hunger and poverty alleviation. This article reviews empirical data from equatorial Africa that touch on this assertion, updating the work on the subject published in the mid-1990s. Research, largely from East Africa but also including Cameroon in West Central Africa, appearing in several recent and currently emerging publications is assessed and compared. The article attempts to quantify the extent of urban agriculture in several cities based on the proportion of urban households involved, and assesses its statistical and qualitative relationship to urban food and nutrition security as well as its complex relationship to poverty. The role of urban agriculture in closing eco-cycles is discussed in important new data from three cities on how organic solid waste is, or is not, being re-used. Recent efforts in policy-making in three East African cities are reviewed, prior to making a policy analysis. The article concludes that the scale and extent of urban agriculture is increasing with, or perhaps in excess of, urban growth according to available data, and that it is beneficial to human health as well as to hunger and poverty alleviation. Urban livestock production and land availability are particularly beneficial. Poverty alleviation through urban agriculture could be both better understood and supported by appropriate policy measures, since better-off households are currently benefiting more from urban agriculture than the majority of poor households. Nutrient cycling through urban agriculture is enhanced by small mixed crop–livestock farms, which are the "backbone of urban farming systems". Recent policy measures emerging in the region suggest positive future direction.

KEYWORDS gender / household food security / policy analysis / poverty / quantifying urban agriculture / urban eco-cycles

I. INTRODUCTION

According to the World Food Summit Declaration of 2009, more than one billion people were suffering from hunger and poverty, whereas the year before, 800 million were estimated to be food insecure, mostly in poor countries.(1) The numbers of hungry people in sub-Saharan Africa continue to rise even as global food production increases. It was estimated that in 2004 more than half of the region's population, or 350 million people, were hungry – defined as the recurrent or involuntary lack of access to food.(2) With world population expected to peak at nine billion by 2050 and food production capacity stretched to its limits based on current and

1. von Grebmer, K V, H Fritschel, B Nestorova, T Olifinbiyi, R Pandya-Lorch and Y Johannes (2008), *Global Hunger Index: The Challenge of Hunger 2008*, Welthungehilfe, IFPRI, Concern Worldwide, Bonn, Washington DC, Dublin, October, 40 pages.

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projected patterns of demand, attention is focused on identifying ways to achieve food security.

Two aspects of achieving food security may be distinguished, namely increasing production and improving access and distribution. It is known that extreme hunger can occur even in conditions of adequate production due to the absence of adequate distribution mechanisms – in particular, democratic institutions – that allow access to food by all.[3] Urban agriculture[4] is one mechanism that plays a role in enhancing access to and distribution of food in urban areas, thus filling the hunger gap, as pointed out some time ago in the book *Cities Feeding People: An Examination of Urban Agriculture in East Africa*.[5]

This article is by way of an update, using empirical data, again much of it from East Africa, to examine the role of urban agriculture in providing access to food.[6] Apart from attempting to quantify urban agriculture, the article discusses its relationship to poverty, food security and the management of urban wastes, a theme highlighted almost 20 years ago in a seminal article by Smit and Nasr in this journal.[7] The present article, after reviewing urban agriculture policy-making in three countries, concludes with a summary of the data and the policy directions they suggest.

II. WHAT IS THE EXTENT OF URBAN FOOD PRODUCTION?

Although there has been a significant volume of research on urban agriculture, rather little has been directed at quantifying its scale and extent based on data that can be projected to show its incidence in a population. In 1996, a global survey sponsored by the United Nations Development Programme (UNDP) estimated that 800 million people worldwide were engaged in urban agriculture.[8] In 1998, it was estimated that by 2020, 35–40 million people in six countries of East and Southern Africa would be dependent on it for part of their food, based on data available at that time.[9] Both estimates relied on the International Development Research Centre (IDRC)-supported surveys in four East African countries,[10] combined with other sources.

To be useful for quantitative projection, surveys need to be based on urban household samples. Many studies only sample urban farmers without situating them in the broader population. The book *Cities Feeding People*, mentioned above, provided rich data based on studies in the four capital cities of Ethiopia (Addis Ababa), Kenya (Nairobi), Tanzania (Dar-es-Salaam) and Uganda (Kampala) in the 1980s and 1990s.[11] The Addis Ababa study only sampled vegetable growers, but quoted a 1983 household survey that included questions about vegetable growing.[12] The Kenyan study was based on a national urban sample,[13] including data specific to Nairobi. The Kampala data were based on random samples of households in several selected neighbourhoods.[14] The study of Dar-es-Salaam[15] only sampled farmers, but luckily a study in the same area a few years later provided comparative data.[16] These best available figures are summarized in Table 1.

These data describe a period in the 1980s and early 1990s when the economic situation in these countries was quite bad and many might be expected to turn to farming for survival. Although not based on a comparative method, the relatively high proportions of farming

2. USDA (2006), *Food Security Assessment 2005*, Agriculture and Trade Reports GFA–17, Washington DC.

3. Sen, A (1981), *Poverty and Famines: An Essay on Entitlement and Deprivation*, Oxford University Press, Oxford, 257 pages.

4. This article defines urban agriculture as crop and livestock production within urban boundaries.

5. Egziabher, A G, D Lee-Smith, D G Maxwell, P A Memon, L J A Mougeot and C J Sawio (editors) (1994), *Cities Feeding People: An Examination of Urban Agriculture in East Africa,* IDRC, Ottawa, 146 pages.

6. Major new sources of data discussed here include two recently published books: Prain, G, N K Karanja and D Lee-Smith (editors) (2010 forthcoming), *African Urban Harvest: Agriculture in the Cities of Cameroon, Kenya and Uganda*, Springer, New York, and IDRC, Ottawa; and Cole, D C, D Lee-Smith and G W Nasinyama (editors) (2008), *Healthy City Harvests: Generating Evidence to Guide Policy on Urban Agriculture,* CIP/Urban Harvest and Makerere University Press, Kampala, Uganda, and Lima, Peru. These emerge from the African regional programme of Urban Harvest, which is a system-wide initiative of the Consultative Group on International Agricultural Research (CGIAR) established in 2000 to address urban agriculture within the CGIAR mandate. These data are discussed in relation to other studies, including Egziabher et al. (1994), see reference 5; also Bakker, N, M Dubbeling, S Gundel, U Sabel-Koschela and H de Zeeuw (editors) (2000), *Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda.* A Reader on Urban Agriculture, Deutsche Stiftung fur internationale Entwicklung (DSE), Germany; Foeken, D (2006), "*To Subsidize my Income*" *– Urban Farming in an East African Town*, Brill, Leiden, Boston; and van Veenhuizen, R (editor) (2006),

TABLE 1
First statistical studies of farming in East African capitals

Capital city	Country	Farming households	Survey date
Addis Ababa[1]	Ethiopia	17% – vegetables only	1983
Dar-es-Salaam[2]	Tanzania	36% – crops only	1995
Kampala[3]	Uganda	30% – crops and livestock	1991
Nairobi[4]	Kenya	20% – crops only	1985

SOURCE: [1] Egziabher, A G (1994), "Urban farming, cooperatives and the urban poor in Addis Ababa", in A G Egziabher, D Lee-Smith, D G Maxwell, P A Memon, L J A Mougeot and C J Sawio (editors), *Cities Feeding People: An Examination of Urban Agriculture in East Africa*, IDRC Ottawa, 146 pages.
[2] Mascarenhas, O (1999), "Kigogo and Hananasif in Dar-es-Salaam, Tanzania: gender aspects of urbanization and natural resource management", in D Lee-Smith (editor), *Women Managing Resources: African Research on Gender, Urbanization and Environment*, Mazingira Institute, Nairobi, pages 52–79.
[3] Maxwell, D G (1994), "The household logic of urban farming in Kampala", in Egziabher et al. (editors) see above.
[4] Lee-Smith, D and P A Memon (1994), "Urban agriculture in Kenya", in Egziabher et al. (editors), see above.

households meant these data were taken seriously. The Kenyan study used the most systematic sampling techniques[17] and suggested a steady continuum linking urban farming with population size, with a higher proportion of farmers in the smaller urban centres and the lowest proportion (although still high at one-fifth of all households) in the capital.[18] Maxwell's observation that more than half the land within Kampala's municipal boundaries was being used for agriculture was likewise telling, as was the fact that 70 per cent of poultry products consumed in the city were also produced there.[19]

Despite the fact that these figures needed to be validated and updated as economic conditions changed, reliable surveys were expensive to undertake and were few and far between. As shown in Table 2, the work of Foeken and Owour in Nakuru, the fourth largest urban centre in Kenya, validated the earlier Kenyan survey, showing that 35 per cent of Nakuru's population engaged in urban farming in 1998, with 27 per cent of all households growing crops and 20 per cent keeping livestock in town.[20] The overall figure for Nakuru placed it in the Kenyan urban continuum, close to Kisumu, Kenya's third largest city, which had 30 per cent of households farming some years earlier.[21]

In Kampala, the Urban Harvest studies carried out in 2003 provided an indication of the proportion of households engaged in both urban and peri-urban agriculture.[22] Percentages found in the urban zones[23] were not inconsistent with those documented by Maxwell in the early 1990s, averaging 26.5 per cent. However, the figures for the peri-urban zones were much higher, averaging 56 per cent.[24] These figures beg many questions, not least the need for validation, for they suggest an active – mostly peri-urban – household agriculture system that could provide good opportunities for intensification of production close to urban markets.[25] This pattern accords well with observational data from Dar-es-Salaam in Tanzania[26] and historical data from Yaoundé in Cameroon,[27] which both show how these patterns move outwards with the growth of a city, suggesting that urban agriculture is a form of "shifting cultivation".

Cities Farming for the Future – Urban Agriculture for Green and Productive Cities, RUAF Foundation, IDRC, Ottawa, and IIRR, Leusden, The Netherlands.

7. Smit, J and J Nasr (1992), "Urban agriculture for sustainable cities: using wastes and idle land and water bodies as resources", *Environment and Urbanization* Vol 4, No 2, October, pages 141–152.

8. Smit, J, A Ratta and J Nasr (1996), *Urban Agriculture: Food, Jobs and Sustainable Cities*, UNDP Habitat II Series Vol 1, UNDP, New York, 302 pages.

9. Denninger, M, B Egero and D Lee-Smith (1998), *Urban Food Production; A Survival Strategy of Urban Households*, Report of a Workshop on East and Southern Africa, Regional Land Management Unit (RELMA) and Mazingira Institute, Nairobi, 38 pages.

10. See reference 5.

11. See reference 5.

12. Egziabher, A G (1994), "Urban farming, cooperatives and the urban poor in Addis Ababa", in Egziabher et al. (editors) (1994), see reference 5, pages 85–104.

13. Lee-Smith, D and P A Memon (1994), "Urban agriculture in Kenya", in Egziabher et al. (editors) (1994), see reference 5, pages 67–84.

14. Maxwell, D G (1994), "The household logic of urban

TABLE 2
Follow-up surveys of crop and livestock farmers in two places

Town/city	Country	Farming households	Survey date
Nakuru[1]	Kenya	35% – inside town boundary	1998
Kampala[2]	Uganda	49% – inside city boundary (average)	2003
Kampala[3]	Uganda	26.5% – urban zones	2003
Kampala[4]	Uganda	56 % – peri-urban zones	2003

SOURCE: [1] Foeken, D (2006), "*To Subsidize my Income*" – *Urban Farming in an East African Town*, Brill, Leiden, Boston. [2][3][4] David, S, D Lee-Smith, J Kyaligonza, W Mangeni, S Kimeze, S Aliguma, A Lubowa and G W Nasinyama (2010 forthcoming), "Changing trends in urban agriculture in Kampala", in G Prain, N K Karanja and D Lee-Smith (editors), *African Urban Harvest: Agriculture in the Cities of Cameroon, Kenya and Uganda*, Springer, New York and IDRC, Ottawa.

Kampala appears to be the only place where there has been such longitudinal measurement of the scale and extent of urban agriculture in a city, based on household sampling. Kampala City Council is also unusual, not only in having a Department of Agriculture but also in having developed both by-laws governing urban agriculture and a system of classifying types of urban agriculture zones within its boundaries. It had intended to conduct a citywide census on agriculture but lacked the resources to do so.[28]

David et al. came to three important conclusions. First, agriculture is practiced everywhere in Kampala, even near the centre. Second, there is an urban agriculture gradient with a higher proportion of farmers towards the periphery. Third, the overall proportion of urban farming households (now roughly estimated at 49 per cent) could be higher than previously thought because more space is occupied by peri-urban than urban areas due to the concentric spatial pattern of the city.[29] However, this may be a faulty assumption, as peri-urban densities are also lower.

A fourth important conclusion to be drawn from this work in Kampala is that the proportion of urban households that are farming has not diminished with urban growth. Thus, the overall numbers of urban farmers, and by implication the amounts of food they produce, must have increased substantially. According to the 2002 national census, Kampala's population was increasing by 3.8 per cent per annum. Thus – even if the proportion of farmers in the overall population was not growing as the survey suggests but was merely stable – the numbers of people involved, and the quantities of food produced, were escalating at the same (or an even higher) rate as urban growth. This finding reinforces earlier projections based on urban population growth, and even suggests they may be conservative.[30]

III. WHAT EFFECT DOES URBAN AGRICULTURE HAVE ON FOOD SECURITY?

Food security, meaning that "…all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy

farming in Kampala", in Egziabher et al. (editors) (1994), see reference 5, pages 47–65.

15. Sawio, C J (1994), "Who are the farmers of Dar-es-Salaam?", in Egziabher et al. (editors) (1994), see reference 5, pages 25–46.

16. Mascarenhas, O (1999), "Kigogo and Hananasif in Dar-es-Salaam, Tanzania: gender aspects of urbanization and natural resource management", in D Lee-Smith (editor), *Women Managing Resources: African Research on Gender, Urbanization and Environment*, Mazingira Institute, Nairobi, pages 52–79.

17. Six urban areas were selected from along a continuum of such areas based on high to low total population and representative of Kenya's agro-climatic zones and socio-cultural diversity. A random household sample was drawn from each town proportional to its size and stratified by income based on known income distribution patterns.

18. See reference 13.

19. See reference 14.

20. Foeken, D and S Owour (2000), "Urban farmers in Nakuru, Kenya", ASC Working Paper No 45, Africa Studies Centre, Leiden and Centre for Urban Research, University of Nairobi; also see reference 6, Foeken (2006).

21. See reference 13.

22. David, S, D Lee-Smith, J Kyaligonza, W Mangeni,

life",[31] can be measured at different levels, from the household to the national, and various survey instruments have been developed to do so. A rigorous study of farming and non-farming households in Kampala in 2003 found that the main factors affecting household food security were wealth, land size, the keeping of livestock, gender and education.[32] Thus, a relationship was clearly established between urban agriculture and household food security, something already asserted by earlier studies in Nairobi, Kampala and Nakuru.[33]

A related study[34] found that nutrition security (for which food security is a necessary but not sufficient condition) was linked to the same factors. In particular, child consumption of animal-source foods was associated with better child health and nutrition, suggesting that keeping urban livestock increases both food and nutrition security and should be encouraged in Kampala and similar cities. Both studies were published in a book that also assessed the health risks of urban agriculture, including the transmission of diseases from livestock to humans, and used a policy analysis to balance them with the benefits.[35]

The most common types of livestock raised in Kampala are poultry, dairy cattle and pigs, and both children and adults get much of their protein and micronutrient needs from milk, which is usually taken for breakfast in the form of tea. Boiling milk for consumption as tea is a widespread and effective way of mitigating any health risks from most common diseases that can be transmitted from livestock to humans via milk.[36]

In Yaoundé, the capital of Cameroon in West Africa, on the other hand, dairy cattle are not common and the most prevalent types of livestock are poultry and pigs.[37] Yaoundé's low-income urban residents meet their protein and micronutrient needs by consuming groundnuts with fresh leafy vegetables, which also supply calcium.[38] Yaoundé's low-income households grew 27 per cent of the leafy vegetables they consumed, while the proportion for all income groups was 10 per cent;[39] some households also sold these vegetables. In addition, on average, everyone received more than 20 per cent of the vegetables they ate as gifts from family and friends. Urban households also produced 10 per cent of the fresh cassava roots and cassava leaves they consumed, and 5–8 per cent of the plantain, cocoyam (taro), banana, processed cassava products and papaya. A large variety of traditional leafy vegetables is grown in the city, three in particular (cassava leaves, *Vernonia* and *Amaranthus*) providing 8 per cent of the protein and 40 per cent of the calcium intake of all urban consumers.[40]

The protein in amaranths is high in lysine, an essential amino acid lacking in roots and tubers, which are also commonly consumed. This is important for the poorer households where animal-source foods are rarely eaten. In many African cities, the less nutritious *Brasssicas*, such as cabbage and kale, have replaced these indigenous vegetables, but in Yaoundé all households consume traditional leafy vegetables, with only 42 per cent consuming *Brassicas*, mainly those who are better off.[41]

It is interesting to compare the figures from Yaoundé with those of Nakuru in Kenya, where urban farms were found to supply 22 per cent of the basic food intake of farming households and eight per cent of the overall food and nutritional needs of the town.[42] Urban and peri-urban food production in Dar-es-Salaam appears to provide an even higher proportion, generating 90 per cent of the leafy vegetables and at least 60 per cent of the milk consumed in the city.[43]

S Kimeze, S Aliguma, A Lubowa and G W Nasinyama (2010), "Changing trends in urban agriculture in Kampala", in Prain et al. (editors) (2010 forthcoming), see reference 6.

23. 100 per cent sample of two selected zones intended, along with two selected peri-urban zones, to be a pilot for a citywide urban farming census. Note that both urban and peri-urban zones are within city boundaries.

24. See reference 22, Table 6.7.

25. Nyapendi, R, R Best, S Ferris and J Jagwe (2010), "Identifying market opportunities for urban and peri-urban farmers in Kampala", in Prain et al. (editors) (2010 forthcoming), see reference 6.

26. Jacobi, P, J Amend and S Kiango (1999), "Urban agriculture in Dar-es-Salaam: providing an indispensable part of the diet", in Bakker et al. (editors) (2000), see reference 6, pages 257–283.

27. Bopda, A and L Awono (2010), "Institutional development of urban agriculture – an ongoing history of Yaoundé", in Prain et al. (editors) (2010 forthcoming), see reference 6.

28. See reference 22.

29. See reference 22.

30. See reference 22; also see reference 9.

31. Food and Agriculture Organization (FAO) (2002), *The State of Food Insecurity in the World 2001*, FAO, Rome.

32. Sebastian, R, A Lubowa, F Yeudall, D Cole and S Ibrahim (2008), "The association between household food security and urban farming in Kampala", in Cole et al. (editors) (2008), see reference 6, pages 69–87.

33. Mboganie-Mwangi, A and D Foeken (1996), "Urban agriculture, food security and nutrition in low-income areas of the city of Nairobi, Kenya", *African Urban Quarterly* Vol 11, No 2 and 3, pages 170–179; also see reference 14; and see reference 6, Foeken (2006).

34. Yeudall, Y, R Sebastian, A Lubowa, J Kikafunda, D Cole and S Ibrahim (2008),

IV. HOW DOES URBAN AGRICULTURE RELATE TO POVERTY?

While it is true, as often pointed out, that the majority of urban farmers are poor, the socioeconomic data need careful examination. In general, the majority of such farmers are poor because so is the majority of the urban population. Sawio pointed out in his data from Dar-es-Salaam that:

> "…cutting across broad socioeconomic, ethnic, educational and occupational statuses, the urban farmers of Dar-es-Salaam include professionals, teachers and administrators, government officials, decision makers and urban planners, married women, single mothers as heads of household, students, casual labourers, the unemployed and part- and full-time workers."(44)

He further states that there was a generalized perception among most urban farmers that well-placed people benefit most from urban farming, whereas the poor, landless and women benefit least.(45)

Other surveys in Dar-es-Salaam and Nakuru confirm that such perceptions are correct.(46) A survey of households in different areas of Dar found that none of the poor or even moderately poor had access to urban farms, whereas 89 per cent of the wealthy did as did 20 per cent of those in the middle-income group.(47) Similarly, data from Nakuru showed that the poor, especially women-headed households, were proportionally less represented among urban agriculture producers than the better-off. This was particularly marked among households raising larger livestock such as cattle, and Foeken attributes this to several factors, including the targeting of better-off farmers by extension programmes, but suggests that lesser access to land by the poor is a major reason.(48) The association of better-off households with large livestock-keeping was confirmed by subsequent studies, also in Dar and Nakuru.(49)

However, socioeconomic analysis also reveals a more complex relationship between urban agriculture and poverty, which requires further investigation. Specifically, we must ask whether urban farming gets households out of poverty.

Initially hardly noticeable, there is an important characteristic of urban farming households that consistently emerges – they are large. As shown in Table 3, farming households in all areas of Kampala, both urban and peri-urban, had an average of seven members in 2003, confirming Maxwell's earlier findings. Contrast this with inner-city households, which have 3.2 persons on average, and peri-urban households, which have 4.5; and national statistics show urban households have 4.2 persons on average and rural households 4.9.(50) This difference is consistent across all towns and cities examined.

It is not clear whether households with many mouths to feed experience pressure to farm for food security, or whether farming enables households to enlarge and support more people.(51) Both Jacobi et al.(52) and Freeman(53) suggested farming is a strategy of large families with more mouths to feed, while Egziabher(54) described it as a strategy of drawing on the labour of extended family members to make the most of the available resources in farming. This latter explanation does not hold for places like Kampala and Nakuru, where the farming households are largely made up of nuclear family members. These striking data deserve attention.

Another conundrum is the fact that urban farming households are better-off than the norm. Seventy per cent of heads of farming households

"Nutritional security of children of urban farmers", in Cole et al. (editors) (2008), see reference 6, pages 89–103.

35. See reference 6, Cole et al. (editors) (2008).

36. Grace, D, G Nasinyama, T F Randolph, F Mwiine and E Kang'ethe (2008), "City dairying in Kampala: integrating benefits and harms", in Cole et al. (editors) (2008), see reference 6, pages 193–210.

37. Dongmo, T, F Meffeja, J-M Fotso and C Nolte (2010), "Crop–livestock integration in the urban farming systems of Yaoundé", in Prain et al. (editors) (2010 forthcoming), see reference 6.

38. Figures here are based on a random urban sample stratified by income.

39. Bopda, A, R Brummett, S Dury, P Elong, S Foto-Menbohan, J Gockowski, C Kana, J Kengue, R Ngonthe, C Nolte, N Soua, E Tanawa, Z Tchouendjeu and L Temple (2010), "Urban farming systems in Yaoundé – building a mosaic", in Prain et al. (editors) (2010 forthcoming), see reference 6.

40. See reference 39.

41. Gockowski, J, J Mbazo'o, G Mbah and T Fouda Moulende (2003), "African traditional leafy vegetables and the urban and peri-urban poor", *Food Policy* Vol 28, No 3, pages 221–235.

42. See reference 6, Foeken (2006).

43. See reference 26.

44. See reference 15, page 46.

45. See reference 15, page 45.

46. Bryceson, D F (1993), "Liberalizing Tanzania's food trade: public and private faces of urban marketing policies 1939–1988", UNRISD, Geneva; also see reference 26; and see reference 6, Foeken (2006).

47. See reference 46, Bryceson (1993).

48. See reference 6, Foeken (2006).

49. See reference 26; also Kang'ethe, E K, A Njehu, N K Karanja, M Njenga, P Kuria Gathuru and A Karanja (2010), "Benefits and selected health risks of urban dairy production in Nakuru", in Prain et al.

TABLE 3
Farming and non-farming household sizes in selected towns and cities

Town/city	Persons in farming households		Persons in non-farming households	
Addis Ababa[1]	7.1	average	–	–
Dar-es-Salaam[2]	5–7	median	4–5	median
Kampala[3]	7.0	average	4.2	average
Nairobi[4]	5.4	average	4.1	average
Nakuru[5]	5–7	median	2–4	median
Nakuru[6]	6.0	average	4	average
Yaoundé[7]	7.9	average	6.6	average

SOURCE: [1] Egziabher, A G (1994), "Urban farming, cooperatives and the urban poor in Addis Ababa", in A G Egziabher, D Lee-Smith, D G Maxwell, P A Memon, L J A Mougeot and C J Sawio (editors), C*ities Feeding People: an Examination of Urban Agriculture in East Africa*, IDRC Ottawa, 260 pages.
[2] Jacobi, P, J Amend and S Kiango (1999), "Urban agriculture in Dar-es-Salaam: providing an indispensable part of the diet", in N Bakker, M Dubbeling, S Gundel, U Sabel-Koschela and H de Zeeuw (editors) (2000), *Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda*. *A Reader on Urban Agriculture*, Deutsche Stiftung fur internationale Entwicklung (DSE), Germany.
[3] David, S, D Lee-Smith, J Kyaligonza, W Mangeni, S Kimeze, S Aliguma, A Lubowa and G W Nasinyama (2010 forthcoming), "Changing trends in urban agriculture in Kampala", in G Prain, N K Karanja and D Lee-Smith (editors), *African Urban Harvest: Agriculture in the Cities of Cameroon, Kenya and Uganda*, Springer, New York and IDRC, Ottawa.
[4] Lee-Smith, D, M Manundu, D Lamba and P K Gathuru (1987), *Urban Food Production and the Cooking Fuel Situation in Urban Kenya*, Mazingira Institute, Nairobi, 299 pages.
[5] Foeken, D (2006), "*To Subsidize my Income"– Urban Farming in an East African Town*, Brill, Leiden, Boston.
[6] Karanja, N K, M Njenga, P K Gathuru, A Karanja and P M Munyao (2010), "Crop–livestock–waste interactions in Nakuru's urban agriculture", in Prain et al. (editors), see above.
[7] Bopda, A, R Brummett, S Dury, P Elong, S Foto-Menbohan, J Gockowski, C Kana, J Kengue, R Ngonthe, C Nolte, N Soua, E Tanawa, Z Tchouendjeu and L Temple (2010), "Urban farming systems in Yaoundé – building a mosaic", in Prain et al. (editors), see above.

(editors) (2010 forthcoming), see reference 6; and Karanja, N K, M Njenga, P Kuria Gathuru, A Karanja and P Munyao (2010), "Crop–livestock–waste interactions in Nakuru's urban agriculture", in Prain et al. (editors) (2010 forthcoming), see reference 6.

50. See reference 22.

51. Prain, G and D Lee-Smith (2010), "Urban agriculture in Africa: what has been learned?", in Prain et al. (editors) (2010 forthcoming), see reference 6.

52. See reference 26.

53. Freeman, D B (1991), *A City of Farmers: Informal Urban Agriculture in the Open Spaces of Nairobi, Kenya*, McGill–Queen's University Press, Montreal and Kingston, page 73.

54. See reference 12.

55. See reference 51.

in Kampala earn more than the national annual per capita income.[55] In Yaoundé, farmers using wastewater irrigation can sell vegetables in the dry season at more than double the wet season price. Few employment alternatives are as lucrative, and incomes were estimated to be 50 per cent above the minimum wage.[56] Likewise in Dar-es-Salaam, 67 per cent of farmers had higher than average incomes, while all Addis Ababa crop farmers had incomes well above the median.[57]

In Kampala and Nakuru, both commercialization and higher incomes have been associated with livestock production, with its opportunities for the sale of products such as milk and eggs in addition to meat.[58] Jacobi et al. noted that anyone in Dar with a vegetable garden and one or two cows could earn more than the basic government salary.[59] Yet almost all farming households, in all studies cited, consumed more than they sold. Furthermore, urban food production is not only a direct food source but also a means of saving on expenditure, freeing up income for other purposes.[60]

We have seen that better-off households are proportionally over-represented among farming households, but it is not as simple as that. Getting access to food products also seems to make poor households better off. A number of factors clearly have to be interacting here as households struggle to find urban livelihoods from meagre resources, including land, of which the poor generally have little. Urban farms, particularly those

that are commercializing, also offer a substantial opportunity for the modernization of agriculture due to their proximity to markets as well as information.[61] The extent to which poor urban farmers are able to make the most of these opportunities is so far unclear from the data. The ways in which urban agriculture protects households against poverty are complex indeed.

Maxwell developed a typology of urban farming households in Kampala in the early 1990s, based on "household logic".[62] In 2010 this was reviewed and updated as a policy tool, and the need for different support strategies was identified. As shown in Table 4, David et al.[63] suggested that the two largest (and poorest) categories of urban farmers, those farming for food security or survival, need policies to provide them with a "safety net". This mainly means organized access to land designated for urban farming, and agriculture extension services to help them produce healthy and safe food. They suggested that the two smaller categories of urban farmers, those farming commercially or for self-sufficiency, need policies and services that help with marketing, but stressed that the approach was one of emphasis. It did not mean that the majority of poor farmers should not receive advice on marketing, only that the priority was to protect their ability to produce food for themselves in order to alleviate hunger.

Finally, on the links between urban farming and poverty, it has been noted, not only in Kampala but in other towns and cities including Dar-es-Salaam, Nairobi and Nakuru, that women-headed households predominate among the poorest of the urban farmers. This is attributed to women's low social status in general (including income and education) and lack of land rights in particular.[64]

Furthermore, throughout sub-Saharan Africa, studies have associated women with agricultural production for subsistence rather than commerce.[65] Nevertheless, the data from both Yaoundé and Nakuru suggest that this relationship is a cultural norm that could be changing with the practice of urban agriculture. For example, women dominate both subsistence and commercial production in Yaoundé, although this may be a local variant. Particularly in East and Southern Africa, it is noted that women frequently carry out the majority of urban farm labour,

56. See reference 51.

57. Mougeot, L J A (1994), "African city farming from a world perspective", in Egziabher et al. (editors) (1994), see reference 5, pages 1–24.

58. See reference 51.

59. See reference 26.

60. See reference 51.

61. See reference 25.

62. See reference 14.

63. See reference 22.

64. See reference 22; also see reference 6, Foeken (2006); see reference 49, Karanja et al. (2010); Lee-Smith, D, M Manundu, D Lamba and P K Gathuru (1987), "Urban food production and the cooking fuel situation in urban Kenya", Mazingira Institute, Nairobi, 299 pages; and see reference 26.

TABLE 4
Urban farming typology developed for Kampala, Uganda

Type	Characteristics	Prevalence	Policy priority
Commercial	Farming enterprise is main source of household income	Few	Marketing support
Sufficiency–commercial	Mixed crop–livestock farms providing food and secondary income source	Minority	Marketing support
Food security	Small mixed or crop farms providing some food and occasional sales	Numerous	Safety net: land, extension advice
Survival	Poor households farming to prevent starvation	Numerous	Safety net: land, extension advice

SOURCE: Adapted from David, S, D Lee-Smith, J Kyaligonza, W Mangeni, S Kimeze, S Aliguma, A Lubowa and G W Nasinyama (2010 forthcoming), "Changing trends in urban agriculture in Kampala", in Prain, G, N K Karanja and D Lee-Smith (editors), *African Urban Harvest: Agriculture in the Cities of Cameroon, Kenya and Uganda*, Springer, New York and IDRC, Ottawa.

including tasks culturally assigned to men such as managing livestock, but often may not control the income generated.[66]

V. HOW EFFECTIVELY DOES URBAN AGRICULTURE RECYCLE WASTE?

Smit and Nasr pointed out that cities are conventionally planned and developed without taking account of ecological processes, but that urban agriculture, which makes use of natural resources otherwise treated as waste and processes them, is an appropriate way of planning for urban environmental sustainability.[67] They gave a number of examples of such processes, emphasizing recycling of liquid waste, including the use of wastewater in agriculture around Mexico City and the production of fish and vegetables in Kolkata using sewage lagoons and wastewater. But while the equal importance of recycling organic solid waste through urban agriculture was highlighted, few examples were given. The present article addresses this aspect, using empirical data from Nairobi and Nakuru in Kenya and Yaoundé in Cameroon, to illustrate how African informal urban farming systems embody such ecological processes.[68]

Typical of many poor country cities, 70 per cent of Nairobi's solid waste is biodegradable and potentially useful. Mapping of organic solid waste flows in 2003–2004 showed that very little of the estimated 2,000 tonnes each of nitrogen (N) and phosphorus (P) and 3,700 tonnes of potassium (K) – worth about US$ 2 million per annum – was used, and then in an uncoordinated and largely informal way. Most was in the form of livestock manure, while domestic solid waste was also used as livestock feed on small mixed farms in backyards. Most people with backyards in Nairobi are middle or high income. Less than one per cent of Nairobi's solid waste was processed by low-income groups making compost.[69]

The small mixed farms typical of Yaoundé play a similarly useful role in the city's ecological cycles, but on a larger scale. It was calculated that more than 20,000 tonnes (dry weight) of organic fertilizer was produced in the city annually in the form of livestock manure, of which about 69 per cent was utilized in farming and the rest, about 6,350 tonnes, was discarded. Interestingly, 10 per cent of the capital city's manure production was sold for use in urban farming in another city, Bamenda, where it fetched a higher price.[70] The ministries of agriculture and livestock were unaware of this organized market at the time of the survey.

Yaoundé's organized market compares favourably with that in Nairobi. Although rural Maasai herders outside Nairobi were found to be linked to urban and rural crop production enterprises via an organized market in the city, manure produced by livestock keepers within the city was disconnected from this and mostly dumped or burned. There was an almost total lack of market information on compost and manure within the city, such that lower quality compost was priced higher than better quality manure, and people travelled far to buy domestic food wastes to feed livestock when such wastes were available nearby.[71] The non-market systems were working quite well, however, with a projected 54,500 households in 2003 in Nairobi using compost they produced themselves, and an estimated 37,700 households using livestock manure to fertilize their crops, just under half (44 per cent) producing it on their own mixed farms.[72]

65. See reference 26; also Hovorka, A and D Lee-Smith (2006), "Gendering the urban agriculture agenda", in van Veenhuizen (editor) (2006), see reference 6; see reference 39; and see reference 49, Kang'ethe et al. (2010).

66. See reference 51.

67. See reference 7.

68. See also Lee-Smith, D, N Karanja, M Njenga, T Dongmo and G Prain (2010), "Nutrient cycles in three African cities", *Urban Agriculture Magazine* Vol 23, RUAF, Leusden, The Netherlands.

69. Njenga, M, D Romney, N K Karanja, P K Gathuru, S Kimani, S Carsan and W Frost (2010), "Recycling nutrients from organic wastes in Kenya's capital city", in Prain et al. (editors) (2010 forthcoming), see reference 6.

70. See reference 37.

71. See reference 69.

72. See reference 69; also see reference 68.

Again in Nakuru, urban farmers were found to be recycling almost all of their domestic organic waste, mostly as livestock fodder, while of the 283,000 tonnes of wet manure produced annually on urban farms, just under half was re-used as fertilizer. The middle-income households with backyard mixed farms re-used 88 per cent, but low-income farmers with less space only achieved 17 per cent re-use, resulting in dumping and environmental contamination. Some intensive vegetable producers in the low-income areas were, however, making good use of this manure on under-utilized plots, and in 2009–2010 the practice was being expanded with municipal support. Efforts were also underway to re-use dumped manure for co-composting with household and market organic waste, for packaging and sale as a bio-fertilizer.(73)

73. See reference 49, Karanja et al. (2010); also, Karanja, N K, personal communication.

VI. FROM DATA TO POLICY: EXAMPLES FROM EAST AFRICA

The intention so far has been to avoid ideological debate about whether urban agriculture is a good or a bad idea and rather, to concentrate on determining its characteristics in order to bring a degree of rigour to its analysis. This is also intended to make the data useful in the formulation of policy. Before moving to the normative question of what policy "should be", based on the data presented here, this section describes some recent efforts to address urban agriculture policy in East Africa.

Since the research findings on urban agriculture began to be disseminated, there have been parallel initiatives on policy.(74) IDRC, the Resource Centres on Urban Agriculture and Food Security (RUAF) and Urban Harvest have supported both research and policy development in many African countries and across the world,(75) as has the Urban Management Programme (UMP) and several agencies of the UN. For example, UN–Habitat has supported city development strategies that often include urban agriculture. Many cities, and countries, have responded with policy initiatives and reforms, including several in Africa.(76) One notable example is Brazil, which has incorporated urban agriculture in policy measures based on the Right to Food.(77)

The policy environment in three East African capital cities will now be examined in detail. Policy review and reforms of urban agriculture have been taking place in Tanzania, especially Dar-es-Salaam, since the early 1990s.(78) Both the Kenyan and Ugandan governments are currently developing urban agriculture policies, while linking research to policy has been applied in several African countries.(79) A complete study of the health benefits and risks of urban agriculture in Kampala has also applied policy analysis.(80)

74. Mougeot, L (2006), "Growing better cities: urban agriculture for sustainable development", IDRC, Ottawa, available at www.idrc.ca/in_focus_cities; also see reference 6, van Veenhuizen (editor) (2006); and see reference 6, Bakker et al. (editors) (2000).

75. Mougeot, L, F Gasengayire, D Lee-Smith, G Prain and H de Zeeuw (2010), "IDRC and its partners in sub-Saharan Africa 2000–2008", in Prain et al. (editors) (2010 forthcoming), see reference 6.

76. See reference 74.

77. Gore, C (2008), "Healthy urban food production and local government", in Cole et al. (editors) (2008), see reference 6, pages 49–65.

78. See reference 26; also Mwalukasa, M (1999), "Institutional aspects of urban agriculture in the city of Dar-es-Salaam", in Bakker et al. (editors) (2000), see reference 6, pages 147–159.

79. Lee-Smith, D and G Prain (2010), "The contribution of research–development partnerships to building urban agriculture policy", in Prain et al. (editors) (2010 forthcoming), see

a. Policy in Dar-es-Salaam

Dar-es-Salaam's history of urban farming goes back at least to the 1930s when, according to a gender analysis by Hovorka and Lee-Smith, urban wage workers were expected to be fed by their wives.(81) The practice continued and grew following Independence, because official food and agriculture policies based on rural agriculture production failed to supply urban workers effectively. Policies proved so ineffective that the proportion of urban labourers with farm plots increased from seven per

cent in 1950 to 70 per cent of households in one low-income area in 1974, to 80 per cent in 1980, with two-thirds of the agricultural workers being women.[82]

Policy and legislation was not insensitive to this situation, and urban agriculture was recognized in the Local Government Act (Section 80) of 1982 and the Town and Country Planning Ordinance (CAP 378) of 1992, which specifically allowed but regulated urban crop and livestock production.[83] Starting in 1992, the Sustainable Dar-es-Salaam Programme, supported by the United Nations and aimed at building the capacity of local government, identified urban agriculture as a major concern. This emerged from a stakeholder consultation in 1992–1993 and resulted in the development and implementation of a strategic plan.[84]

Thus, urban agriculture was built into laws and institutions, particularly the Agriculture and Livestock Policy of 1998. Among a number of internationally funded initiatives, the Urban Vegetable Project under the Ministry of Agriculture and Cooperatives improved extension services in Dar and helped build urban farmers' organizational capacity. There is no doubt that these measures and the efforts of farmers have meant that there is an abundance of food produced in the city and many people have benefited through income generation as a result.[85] But both Jacobi et al. and Mascarenhas[86] observed that women, including women-headed households, generally lost out in the official planning and management of urban agriculture.

Mwalukasa notes that policy innovations such as those on urban agriculture are "*…only institutionalized when widely understood, accepted and routinely applied.*"[87] It is not clear to what extent these measures have been monitored and evaluated in practice in the subsequent decade, particularly in relation to their benefits for marginalized groups.

b. Policy in Kampala

Several historical factors influenced how urban agriculture and its policies took shape in Kampala. These include the urban form of the Kingdom of Buganda, located in the same place as the capital; the political upheavals and economic decline of the 1970s, meaning people resorted to urban farming for survival; and the subsequent reforms, which meant openness to public participation in decision-making and even law-making.[88]

In 1988, in the aftermath of the civil war, a group of Ugandans started a non-governmental organization called Environmental Alert to combat food insecurity and poverty. Then in 1993, the Local Government Decentralization Programme empowered locally elected councils to make decisions affecting them and this became a centrepiece of the 1995 Constitution. Urban areas such as Kampala were designated as districts, with Kampala City Council having a Department of Agriculture integrated with the Ministry of Agriculture.

Instead of foundering in bureaucratic confusion, these reforms were made to work in the city through collaboration among a group of motivated individuals. The city council provided extension services to urban farmers by working in conjunction with NGOs, and developed a typology of urban farming areas within its boundaries. Maxwell's research,[89] which engaged with policy processes, also helped. The Kampala Urban Structure Plan of 1994 incorporated recommendations

reference 6; also see reference 6, van Veenhuizen (editor) (2006); and see reference 6, Bakker et al. (editors) (2000).

80. See reference 6, Cole et al. (editors) (2008).

81. See reference 65, Hovorka and Lee-Smith (2006).

82. See reference 65, Hovorka and Lee-Smith (2006).

83. See reference 26.

84. See reference 78, Mwalukasa (1999).

85. See reference 26.

86. See reference 26; also see reference 16.

87. See reference 78, Mwalukasa (1999), page 156.

88. This section relies mainly on Lee-Smith, D, S M Azuba, J M Musisi, M Kaweeza and G Nasinyama (2008), "The story of the health coordinating committee, KUFSALCC, and the urban agriculture ordinances", in Cole et al (editors) (2008), see reference 6, pages 219–229; also Lee-Smith and Prain (2010), see reference 79.

89. See reference 14.

that land use and zoning regulations should enhance urban agriculture within and adjacent to the city.

The Urban Structure Plan was not popular with everyone, especially with regard to the use of wetlands for urban agriculture, because people feared that urban-produced food was contaminated. But the policy environment supported stakeholder involvement in decision-making, including the Urban Harvest-supported research on health and urban agriculture.[90] Another outcome was the creation of the Kampala Food Security, Agriculture and Livestock Coordinating Committee (KUFSALCC), which integrated research and policy. Then in 2006, the city council passed new ordinances on urban agriculture following a participatory process of public consultation – the first instance of public participation in law-making under Uganda's 1995 Constitution.

Kampala City Council continued with related projects, including linking housing and urban food production and integrated environmental management. And in 2009, the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF) was allocated a budget for the development of an urban agriculture policy within government's five-year Development Strategy and Investment Plan.

However, in Kampala as in Dar-es-Salaam, it is not known whether such policy initiatives will benefit the poor and marginalized. As Gore[91] and Lee-Smith and Prain[92] have cautioned, policy outcomes and their implementation seldom favour such groups, particularly if they are not organized and fail to articulate their interests in the political arena.

90. See reference 6, Cole et al. (editors) (2008).

91. See reference 77.

92. See reference 79, Lee-smith and Prain (2010).

c. Policy in Nairobi

Despite its economic development, Kenya neglected the interests of the poor in its rapidly growing urban centres – particularly the capital, Nairobi – for four decades following Independence in 1963.[93] This led to a crisis of governance, with disturbances throughout the 1990s and 2000s culminating in near civil war after the 2008 elections. Failure of policy to come to terms with reality in the form of informal sector economic activity and urban slums was accompanied by problems of overlapping and conflicting structures of local government. Despite a change in government in 2002, few policy reforms had emerged by 2008 to benefit lower-income groups in towns and cities, although the policy environment was more tolerant of public participation.

93. This section relies mainly on Lee-Smith and Prain (2010), see reference 79.

There was extensive research on urban agriculture in the country but virtually no central government or policy support for it in Kenya during the 1990s, although international assistance helped initiatives in some local governments outside the capital. Nakuru Municipal Council's Local Agenda 21 and the Greentowns movement in many secondary towns included urban agriculture. The local authorities in Nairobi and other towns remained hostile but NGOs supported some projects in the slums.

When the Consultative Group on International Agricultural Research's (CGIAR) Urban Harvest research on recycling nutrients from organic wastes in Nairobi began in 2002, there was significant interest from key individuals in the public sector. The head of the Kenya Agricultural Research Institute (KARI) called for a stakeholder workshop to develop a national policy on urban agriculture, and this took place in 2004.

Meanwhile, the Nairobi and Environs Food Security, Agriculture and Livestock Forum (NEFSALF) – bringing public, private and community stakeholders together – was convened by Mazingira Institute, a Kenyan NGO that had carried out urban agriculture research in the 1980s. NEFSALF's first action in 2004 was to elaborate a "sectoral mix and cooperation model" to address the governance crisis through a bottom-up approach, building institutions through consultation rather than conflict. The forum attracted many farmers, with nearly 700 members belonging to about 50 groups by 2008. The farmers formed a network with a gender-balanced executive and procedures, and set their priorities, which included skills training. Courses began in response, with input from the Ministry of Agriculture and the Ministry of Livestock, which had also attended the forum.

This had such an impact that Nairobi province was selected to launch the second phase of the National Agriculture and Livestock Extension Programme (NALEP) in 2006. At the same time, Nakuru Municipal Council was developing urban agriculture by-laws with help from Urban Harvest, and in early 2009 a central government task force met to begin work on drafting an urban agriculture policy. Furthermore, urban agriculture has been incorporated into the National Land Policy, adopted by Parliament in 2010.

VII. SUMMARY AND CONCLUSIONS: MESSAGES FOR POLICY

The final section of this paper constitutes a policy analysis based on the empirical data presented and the opportunities afforded by the shifts that are taking place in the policy environment.

Most of the data now available are far from perfect, but the picture that is emerging is pretty clear. There seems to be no doubt that urban agriculture provides one important solution to the problems of food security confronting the African region in particular, and that it could play a much greater role if policies were better targeted at poor and marginalized households.

For the places studied, urban agriculture is a large and growing phenomenon, expanding as cities grow, or even faster. Many urban households resort to urban agriculture, mainly to provide themselves with food. A somewhat smaller percentage earns some income from the sale of food items they produce, particularly livestock products. Urban agriculture plays a significant role in both food and nutrition security for African urban households, and land availability and urban livestock are critical factors in enabling it to sustain that role. The nutritional benefits of urban livestock-keeping outweigh any health risks involved, which can be managed.[94] It is established that urban agriculture is a good way to alleviate hunger.

94. See reference 36.

There is a complex relationship between urban agriculture and poverty that needs to be better understood. Better-off households are able to farm more easily and efficiently than poor households, most likely because they have access to land in their backyards. Small, mixed crop–livestock backyard farms appear to be the backbone of cities' urban farming systems, ensuring food and nutrition security for those households and, to an extent, the city itself. They also recycle nutrients in the city ecosystem, reducing waste and pollution, thus contributing to sustainability.

Poor urban households, particularly women-headed households, have lesser access to food and nutrition security through urban agriculture, mainly due to their crowded living conditions and limited access to land. The data suggest that urban agriculture is a good way to alleviate poverty, although rigorous social science that establishes this has yet to be undertaken. Still, we know that a lower proportion of the poor than the rich currently have access to urban agriculture as a means of livelihood.

Turning to policy, urban agriculture is a complex area for policy, potentially involving several different policy goals:

- hunger alleviation;
- poverty alleviation;
- economic growth through value addition; and
- ecological urban management.

Ideally, policies should identify their priority goals. If there are several, policy objectives should be clear, and strategies targeted to achieve specific outcomes and monitored accordingly. Of course, there could be win–win strategy combinations, but clarity of purpose is needed especially if and when trade-offs have to be made. For example, the opportunities for developing a vibrant agriculture sector in and around towns seem obvious from the data. However, given the figures cited at the start, from an ethical point of view, and in terms of the Millennium Development Goals, the alleviation of hunger and poverty among poor urban households would seem to be priority policy goals.

Especially in the absence of other adequate employment opportunities, urban agriculture looks promising. And, as pointed out by Cole et al.,[95] allowing urban farming is a requirement of the Right to Food. That is, the minimum obligation of central and local governments under international human rights instruments is not to prevent people from providing themselves with food essential to their survival, and to protect them against others who would stop them.[96] Of course, governments may go further, promoting and fulfilling the Right to Food by ensuring marginalized groups have the means to provide themselves with food – mainly land – and by providing extension services so that food is produced in a healthy way.

A number of countries are moving in this direction, as they formulate urban agriculture policies. A useful policy guideline of this kind emerged from the typology of urban farmers developed in Kampala.[97] The application of policy in Dar-es-Salaam,[98] which allows for virtually unregulated backyard farming (for the better-off) and open space farming (for the poor) deserves careful monitoring in implementation for its effects. Ongoing experiments in Nakuru involving the allocation of space in high density neighbourhoods for urban farming – and using excess livestock wastes there – likewise deserve attention.

Key policy implementation strategies suggested are:

- encouraging backyard farming;
- making parcels of land available specifically to poor and women-headed households;
- providing extension and other support services, especially for livestock production;
- supporting depots for livestock waste for use in co-composting, and for food and other organic waste for livestock feed and co-composting;

95. See reference 6, Cole et al. (editors) (2008).

96. See reference 6, Cole et al. (editors) (2008); also see reference 77.

97. See reference 22; see also Table 4.

98. See reference 26.

- supporting and promoting marketing of urban agriculture products; and
- monitoring and evaluating policy outcomes, especially the extent to which poor, marginalized and women-headed households have improved their health and incomes. (This last strategy would help fill the social science gap on poverty alleviation.)

Finally, a word of caution is needed on policy implementation. Much ink can be wasted on policy recommendations and policy documents if the political will to make them work is missing. Competition between interest groups cannot be ignored.[99] The making and realization of policy is a game of power and conflicting interests. It is politics. The three policy case studies in Section VI above pinpoint some of the factors involved in policy development and execution in three capital cities. The case of NEFSALF in Nairobi represents the only instance of bottom-up organizing of a lobby by farmers themselves, a factor probably needed for effective policy implementation.

99. See reference 79, Lee-Smith and Prain (2010); also see reference 77.

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