

**A SYNTHESIS OF URBAN AND PERI-URBAN AGRICULTURAL RESEARCH
COMMISSIONED BY THE RNRRS PROGRAMME**

FINAL REPORT

This report is a synthesis of information produced on urban and peri-urban agriculture research by the RNRRS programme, 1995-2006.

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ABSTRACT

1. Introduction

1.1. Objective of the study and study approach

The purpose of this cross-programme synthesis study on urban and peri-urban agriculture (UPA) was to distil the experiences and lessons learned by the different RNRRS programmes emphasising common areas and issues and identify challenges ahead. Its aim was not to produce a retrospective synthesis of the 11-year Renewable Natural Resources Research Strategy (RNRRS), but rather to provide a link into future DFID research strategies which might assist programme managers in research identification and prioritisation. The systematisation of RNRRS research outputs is embedded into DFID's Strategy for Research on Sustainable Agriculture (SRSA); reviewing their potential contribution to the three pillars of approaches of the SRSA is important.

All RNRRS programme managers were contacted by email and asked to provide relevant information with regard to their programme outputs. In addition the programme websites were consulted and a detailed search on projects with relevance for the issue of UPA was conducted. As an additional source of information the RNRRS Evaluation report was checked for any information on impact and quality of research within peri-urban production systems, but unfortunately this criterion did not figure as important in the evaluation procedure and no information could be obtained for the different production systems. Another relevant information source was the NRSP synthesis study on peri-urban research of Kumasi, Hubli-Dharwad and Kolkata PUIs (NRSP R 8491), which provided a detailed overview of peri-urban agricultural activities for these three areas.

The study is structured in the following way: review of context; contribution of RNRRS to defining potential and constraints; contributions to improve the potential of UPA; and conclusions and outlook.

1.2. The Development Context

By 2007, one-half of the world's population will be urban-dwellers and in less developed regions, the number of urban dwellers is expected to equal the number of rural dwellers by 2017 (Secretariat, World Population Prospects: The 2004 Revision and World Urbanization Prospects). Since last year's session of the Commission on Population and Development, the number of the world's urban dwellers has increased by some 63 million people, 93 per cent of whom live in less developed regions (Secretariat, World Population Prospects: The 2004 Revision and World Urbanization Prospects). According to a UN-Habitat publication launched on World Habitat Day (6 October 2003), sub-Saharan Africa hosts the largest proportion of the urban population residing in slums (71.9 per cent):: 166 million out of the total urban population of 231 million are classified as slum dwellers. The region has the second largest slum population in the world after South-central Asia, which has 262 million making up 58 per cent of the total urban population in that region. UN-Habitat estimates that 924 million people worldwide, or 31.6 per cent of the global urban population, lived in slums in 2001. In the next thirty years, this figure is projected to double to almost 2 billion, unless substantial policy changes are put in place.

For example, in Nairobi, 55 % of the total population live in 78 slums, comprising 5% of the total land area of Nairobi (LPP ZC0201: Ishani et al. 2002). The two tables below show the increase in urban

population worldwide and in Africa¹ between 1995 and 2030.

Year	%
1995	45.1
2000	47.1
2005	49.2
2010	51.3
2015	53.6
2020	55.9
2025	58.3
2030	60.8

Year	Medium variant
1995	34.6
2000	37.1
2005	39.7
2010	42.4
2015	45.1
2020	47.8
2025	50.7
2030	53.5

This rapid urban growth no longer supports the traditional simplistic divide between ‘urban’ and ‘rural’ (Simon et al 2004). Expanding cities affect the areas surrounding the city by altering the natural resource base, converting land to new uses, changing labour patterns, challenging the environment, concentrating urban waste pollution and diminishing natural resource based livelihoods. For poor people inhabiting these areas a major challenge is to pass through the rural-to-urban transition.

A stylized comparison of key characteristics of rural and urban areas, and of the challenges faced by the poor, is summarized in Table 1 below.

Table 1. Challenges for the Poor in Rural and Urban Areas²

Topic of challenge	Rural Areas	Urban Areas
Livelihood opportunities	To reduce income risk and diversify income sources, non-farm income often sought through periodic migration. Significant dependence on self-provisioning.	Labour market often dualistic. Incomes mainly from semi-permanent wage labour, informal sector, petty trading and increasingly through crime. Greater dependence on cash.
Food security	Adverse climatic conditions may cause local food shortages and hunger.	Adequacy of food depends on cash availability.
Physical and social infrastructure	Facilities often remote and disconnected. Services and O & M often of poor quality.	Formal and high quality services expensive and restricted. Regulation makes low cost alternatives scarce.

¹ Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2004 Revision and World Urbanization Prospects: The 2003 Revision*, <http://esa.un.org/unpp>, 21 November 2005; 6:42:10 AM.

² Source: Based on David Satterthwaite, "Location and deprivation: beyond spatial concepts of poverty". Mimeo, London, IIED, March 2000, and Allison Evans, "Working paper to address spatial considerations in PRSP processes", mimeo, World Bank, Dec. 2000.

Housing and land	Few problems with shelter per se, but land tenure may be insecure .	Choice often limited and environmental risks high. May be forced onto illegal sites.
Institutions/Governance	Largely removed from formal structures of power, but traditional structures have local role.	Often limited access to political power, and vulnerable to corruption. Community and social networks important.
Environmental vulnerability	Adverse climatic conditions impact on livelihoods.	Density and poor urban management worsen effects of environmental disasters and disease risks.

What does this mean in terms of targeting poor people and eradicating poverty and hunger? It means, as reflected in the increasing number of urban focused initiatives and programmes, that the research and development community has to broaden its intervention spectrum to address in parallel to the rural challenges the increasing urban challenges of poverty.

1.3 Urban and Peri-Urban agriculture and its significance for poor people's livelihoods

Over the last decade there has been a growing recognition of the significance of urban and peri-urban agriculture (UPA) for poor people's livelihoods. Although much attention has been given by governments and donors to urban job creation and employment sources, health and infrastructure, IFPRI's Global Vision 2020³ emphasises that efforts to improve urban livelihoods must go beyond a focus on urban jobs. Urban and rural livelihoods are often intertwined through goods, services, and people. In many cities, the majority of urban dwellers depend indirectly on agriculture for their livelihoods, through employment in food transport, retailing, and processing (Brook and Davila 2000). Survival strategies may involve maintaining links with a home community in rural areas, through a plot of land to return to for retirement or continued connections with family (Gregory 2005). Policies for improving urban livelihoods, then, must take into account the complexity of urban-rural links and recognize that rural conditions affect urban livelihoods as well.

Urban agriculture also makes a contribution to the food security of the poor, particularly in urban slums. Even in large, congested cities, the urban poor often have a home garden or raise small animals as part of a coping strategy. This urban production, often done by women, the sick and unemployed, can complement household incomes and improve the quality of urban diets (LPP Urban Livestock Video 2005). Urban planners and local governments should consider how to incorporate environmentally sound urban agriculture in their plans and byelaws.

A recent publication by the World Bank concludes that the poor often diversify their income sources. Common strategies among the urban poor include receiving food support from their rural place of origin, using their homes as a work place, and engaging in urban agriculture⁴.

The CGIAR, through Urban Harvest, which is a system-wide initiative aiming to alleviate poverty through improving the nutritional status of urban farmers, establishing a safer and more adequate food supply and increasing the value of agricultural production, responded to the urbanisation and poverty alleviation issues taking centre stage in the global policy arena. The initiative's objectives are furthermore to reduce the negative impacts of urban agriculture and support improved management of

³ 2020 Focus 3 (Achieving Urban Food and Nutrition Security in the Developing World), Brief 1 of 10, August 2000, OVERVIEW James L. Garrett

⁴ (A Sourcebook for Poverty Reduction Strategies, Chapter 16 Urban Poverty, October 2002 , World Bank, Edited by Jeni Klugman)

the urban environment through agriculture, to target acute crisis situations in urban areas and to seek improved technologies to increase quantity, nutritional and health quality of food produced⁵.

Within the RNRRS portfolio, research projects show that, despite the profound effect urbanisation is having on available natural resources, the majority of people living in the PUI still have natural resource based livelihoods, the most important of which is related to agriculture (eg. farming, livestock keeping, or agricultural labourer) (Gregory 2005; Gündel 2002).

Another important finding (from an NRSP R 8491 study in S India) is that the importance of agriculture as a sole occupation falls with increasing proximity to the city as a result of pressure on land availability and the presence of alternative employment opportunities. As urbanisation changes land use, farming gradually becoming a minor occupation, especially for those whose access to land is constrained by development or where farm prices reduce incomes to unsustainably low levels. The group most notably dependent on agriculture are often poor female agricultural labourers (eg in the Hubli –Dharwad study of NRSP).

1.3.1. Definition of Urban and peri-urban agriculture (UPA)

For the purpose of this review we define UPA as agricultural (including livestock) production, processing, and distribution activities within and around cities and towns, whose main motivation is personal consumption and/or income generation, and which compete for scarce urban resources of land, water, energy, and labour that are in demand for other urban activities. UPA includes small- and large-scale activities in horticulture, livestock keeping, fodder and milk production, aquaculture, and forestry - where several activities may be carried out within one enterprise (Urban Harvest; http://www.cipotato.org/urbanharvest/about_ua.htm; accessed 20.11.2005).

Whereas urban agriculture can be defined more easily by the boundaries of the city, peri-urban agriculture may be defined in terms of the complex and changing processes occurring in the peri-urban interface, where boundaries are less useful to define. The recent NRSP synthesis study on PUIs (Gregory 2005) describes the concept as follows: “The peri-urban concept attempts to move understanding beyond definitions considered solely in terms of geographical location and spatial land use. Rather it considers the PUI as the meeting of rural and urban activities – in effect a process rather than a place (Brook and Davila 2000). Although this is a less comfortable conceptualisation than one based on place, it attempts to categorise linkages and interactions between rural and urban areas “characterised by flows of produce, finance, labour and services and by change – economic, sociological, institutional and environmental” (Purushothaman and Purohit, 2002)”

1.3.2. The main actors involved in urban and peri-urban agriculture

Urban and peri-urban agriculture is not a new phenomenon. Since ancient times urban agriculture has made important contributions to feeding city dwellers. Recently collected qualitative and quantitative data shows that increasing numbers of the urban poor are engaged in urban and peri-urban agriculture (UPA) as a poverty alleviation strategy. Already as many as 800 million people are employed in urban and peri-urban farming and related enterprises, and this number is likely to expand in the future (Urban Harvest; http://www.cipotato.org/urbanharvest/about_ua.htm; accessed 20.11.2005).

Findings from the PUI Synthesis Study (Gregory 2005) support this, by concluding that agriculture remained the most significant livelihood activity for a large proportion of people in peri-urban villages around both Hubli-Dharwad and Kumasi. Over 50% of PUI inhabitants listed agriculture as an important livelihood activity (R7959: 163; R6799/14:94). This increased to almost 70% in the poorer

⁵ King'ori, Peter. March 2004. Assessment of urban and peri-urban agriculture research in the Centres of the Consultative Group on International Agricultural Research (CGIAR) in Sub-Saharan Africa. Urban Harvest Working Paper Series, no.1. International Potato Center. 35 pp.

wealth categories (R8090: 33, fig1; baseline data 2002; NRSP R 8491). In Kumasi, 37% of the population have reported farming as their main occupation, but this is particularly so for women (Brook and Davila 2000).

LPP revealed similar results in a scoping study on urban livestock keeping in East Africa (Gündel 2002). Livestock keeping was an important livelihood strategy for urban dwellers. For instance, a study conducted in the city of Kisumu , Western Kenya recorded 14 different livestock species kept in urban and peri-urban areas (Onim, 2002). In Ethiopia the livestock numbers encountered in major urban and peri-urban areas in 2001 were astonishingly large and an undeniable testimony of their relevance (Tegegne et al., 2002). Similar situations were reported from Kampala, Dar es Salaam and Nairobi (Ishagi et al., 2002; Lupala, 2002 and Ishani et al., 2002 respectively). The importance of urban livestock was also visible in Hubli-Dharwad, where the presence of thousands of pigs (unquantified) roaming free in the cities was observed. However, little work has been conducted within the NRSP peri-urban project portfolio on characterising this system, or those for small ruminants and poultry (NRSP R 7549). Many peri-urban dwellers (including the landless) keep milk buffalos, as there is a considerable urban market for milk and the animals can feed on public land.

The diversity of urban and peri-urban agricultural activities is reflected by the diversity of actors and capital inputs available. UPA can reach from large-scale industrial production units such as intensive egg or poultry production plants or large horticulture glasshouses to a few chickens on traditional vegetables grown and kept on public areas. Within the context of this review we will concentrate on UPA which forms part of the livelihood strategies of poor urban dwellers, as this appears to be the group most neglected by natural resource management research and development activities.

It is important to distinguish between the different social groups involved in urban agriculture as they face different constraints and opportunities and have different reasons to engage in urban agriculture (Fuller 2003). Whereas for the middle-income households, urban livestock keeping can be seen as a response to growing urban demand and markets, for the poor it is in the first place a response to crisis (LPP ZC 0201) where food security, social security, and day-to-day income generation for school fees and emergency expenditures are in the foreground (Urban Livestock video 2005). There is evidence from other projects that this applies to urban poor who practice crop based agriculture too (NRSP R7549, R8491).

Within the group of resource poor urban dwellers engaged in urban agriculture there are further differences in terms of gender, age and educational status (NRSP R7959). The case studies carried out by LPP in East Africa confirmed these findings by showing that the middle aged are the most numerous group of urban livestock keepers, followed by those of retirement age (> 60 years). Only in Nairobi were there a significant number of keepers below 35 years (LPP ZC 0201). In Kisumu it was found that urban agriculture offered an alternative to young people, who were previously drug addicts and involved in crime (Urban Livestock Video 2005).

The predominant primary activity for female household heads was livestock keeping (44 % of household heads) and 42 % derived their major source of income from it. A high proportion of livestock keepers was found to have low levels of formal education. One third of the livestock keepers in Nairobi were reported to have received no formal education. Unfortunately other projects have not developed very gender specific information, eg. the NRSP R 7549) project concludes that practically nothing is known about the role of women in the livelihoods of poor households.

These tendencies were confirmed by the other case studies which pointed out that livestock keeping was usually not the main occupation of households; however in some cases, the contribution to income generation was significant (Livestock video 2005). This is especially true for vulnerable groups (eg. women, retired people, people without formal education) who relied more on livestock keeping due to their limited alternative choices of livelihood options (LPP ZC 0201).

Urban farmers often have few tenure rights over the land (and water) they use in farming, and are often pushed out by land development. The legal situation in most cities in terms of urban farming and

livestock keeping ranges from illegal to tolerated. Although the general attitude by town/city planners is changing and local councils are recognising the existence and potential of urban agriculture, the supporting legislation and its implementation is lagging behind. By-laws and regulations often date back to colonial times (Kironde 1992) and are excessive, unenforceable or inappropriate to local conditions (Livestock Video 2005).

1.3.3. How can urban and peri-urban agriculture contribute to poverty alleviation?

As recognised in DFID’s SRSA framework, a focus on areas of lower physical potential, but with high levels of population and poverty may have a greater impact on overall poverty reduction than focusing only on higher productive areas. This is an important statement in terms of possible future interventions in urban areas in developing countries, where, as we have seen above, the number of poor people is rising and at the same time the physical potential for natural resource based activities is declining. Project findings from the RNRSS and elsewhere indicate that specific interventions in these areas can make positive contributions to people’s livelihood security and the environment.

Fewer poor urban households in the South depend on a single income-source. Income is one of several resources that households utilize to satisfy diverse goals (access to material goods and services, good health, less vulnerability, empowerment etc) and ensure their survival and development. The NRSP R 7549 project concludes that despite the trend away from farming as the main source of livelihoods, the continued importance of agriculture, particularly to women, was evident in Hubli-Dharwad. It was clear that the poorest farmers were food crop farmers with a small area of land. The impression given is that the only option for the resource poor is to continue farming.

Taking the Millennium Development Goals as a framework to understand the potential contribution of urban agriculture, we can conclude the following:

Table 2: Potential contributions of UPA to MDG’s

Millennium Development Goal	Contribution of urban agriculture
Millennium Development Goal 1: <i>Eradication of extreme poverty and hunger</i>	Urban and peri-urban food production, particularly of root and tuber crops, bananas, fruit trees, vegetables, and small-scale livestock contribute to improved food security and income generation. It provides a safety net for the poor, who do not have access to credit or other forms of savings.
Millennium Development Goal 3: <i>Promote gender equality and empower women</i>	Women tend to be more marginalised in urban areas, as they have less access to formal income generating activities. Their focus on household and family related activities impedes them from taking up income generating opportunities. Urban agriculture presents a livelihood strategy which can give good return to limited resource input.
Millennium Development Goal 7: <i>Ensure environmental sustainability</i> Target 11: Improve the lives of at least 100 million slum dwellers by 2020⁶.	In sub-Saharan Africa, an estimated 72 per cent of the urban population live in slums. This compares with 36 per cent in East Asia, 58 per cent in south-central Asia and 32 per cent in Latin America and the Caribbean. Slums are not only a large city phenomenon. Many towns and secondary cities have a high proportion of their populations living in slums. Improved management practices in urban agriculture can help to improve the environmental sustainability of these deprived areas. Waste and waste water management are two important aspects within this discussion.

⁶ Slums are the physical manifestation of poverty, inequality and social exclusion in urban areas. Slum dwellers live in neglected parts of towns and cities where housing and living conditions are appallingly deprived and often hazardous, and

<p>Millenium Development Goal 6</p> <p><i>Combat HIV/AIDS, malaria, and other diseases</i></p> <p><i>Target 8: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases</i></p>	<p>The presence of communicable and non-communicable diseases is a great problem in densely populated areas. Improved management practices and enhanced knowledge and awareness in urban agriculture and especially in urban livestock keeping could contribute significantly to the reduction of several important diseases, such as tuberculosis, sleeping sickness, etc. Adequate management of waste, waste water and agricultural inputs is another important issue to consider in terms of health improvement. The recent spread of the Asian Influenza Virus (bird 'flu) is of particular importance to the health of keepers of poultry in heavily congested slum communities.</p>
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1.3.4. What are the potentials and what are the risks of UPA?

Urban Harvest suggests the following framework to analyse the potential and risks of UPA (Urban Harvest; http://www.cipotato.org/urbanharvest/about_ua.htm; accessed 20.11.2005):

(1) UPA can have both positive and negative impacts as many of the causes of ill-health in the urban and peri-urban environment are multi-factorial (Birley and Lock 1999) UPA has the potential for positive impact on the health of urban populations through improved food security, nutrition and psychosocial well-being. Individual and family health indirectly benefit through the income earned from UPA (LPP R7350; NRSP). Negative impacts come into play through the over-use of pesticides and human exposure to contaminants and pathogens associated with UPA. Zoonotic diseases (disease of animals that can be transmitted to humans and vice versa) can also be a risk of urban livestock raising. LPP (ZC 0271) and AHP (R7360) have contributed to this area through the implementation of a number of projects determining the presence and extent of zoonotic diseases in urban and peri-urban areas. The project findings indicate that health benefits and risks are not equitably distributed within populations: the marginal groups may have to make use of the most contaminated lands for crop production, or through lack of capital may opt to use sewage water as a fertilizer source. Women, who are the main fieldworkers in many regions, may be at greater risk of pesticide poisoning.

(2) The framework also recognizes the importance of communal health, a concept closely linked to the notion of sustainable communities and cities. Distinct from population health, communal health refers to the viability and vitality of communities in terms of their mutual support, trust and sharing and level of participation. UPA has the potential to contribute positively to communal health through collaborative agricultural activities, productive utilization of urban waste products, the provision of a common green space and through networks that link producers and consumers through markets (Urban Livestock Video 2005). This importance of the social capital for resource poor urban dwellers was also emphasised in several projects (NRSP R 8491, LPP ZC 0201).

(3) UPA is able to contribute to the quality of the environment through provision of green spaces and tree planting, so enhancing the "livability" of cities, and efficient recognition and use of urban resources. An important potential contribution of UPA to the built environment is the recycling of organic wastes within the urban and peri-urban area through composting or transformation into fuel briquettes rather than expelling them as contaminants into the environment (LPP ZC 0201; NRSP R 7099 and R 6799; CPP ZA 0193). On the other hand there is evidence from several sources that the level of animal waste use in urban and peri-urban areas is low, due to high transport costs and other

where basic services are lacking. Slum dwellers are not valued as members of the urban community and have few rights. In many areas they live under the constant threat of eviction. <http://www.dfid.gov.uk/mdg/slumdwellerfactsheet.asp>

factors (Brook and Dávila 2000). Urban and peri-urban forestry could also make a contribution to the quality of the built environment. However, there was little evidence apart from in Nepal that community forestry schemes are being used to revitalise peri-urban forestry potential and there were no recorded attempts to combine forestry with agricultural production to provide subsistence benefits or to boost income potential from agriculture. Where peri-urban plantations do exist, there was concern that species do not necessarily meet community needs. Also, for the very poor, the issue of land tenure is a major constraint and population density even in peri-urban areas limits availability of land on which trees can be planted. Although under-utilised private gardens offer a possible location for private tree planting, obtaining access to land that can be planted communally relies on permissive local authority regulation. (FRP Z 0136).

UPA has the potential both to improve and to cause deterioration in the (4) quality of the physical environment through conditioning or contaminating air, soils and water. Evidence from NRSP for example shows that water flowing away from Hubli-Dharwad is usually heavily contaminated with untreated sewage, and numerous farmers take advantage of this perennial supply of water and nutrients for intensive off-season vegetable production (NRSP R 7549). Similar findings were described by LPP (ZC 0201) in terms of uncontrolled sewage and solid waste disposal practices in slum areas and CPHP (R7519) in terms of inadequate pesticide use.

(5) The health and resilience of the biotic community in the urban environment can also be strengthened or weakened by UPA, depending on the levels of diversity cultivated and methods of crop management adopted and the kinds of markets that are targeted.

(6) UPA also has the capacity to positively affect the health of the natural ecosystems beyond the urban and peri-urban areas by stabilizing or breaking down pollutants, reducing food demands and thus reducing the “ecological footprint” of the city (Urban Livestock Video 2005). However, to achieve this, a more favourable environment has to be created to overcome some of the constraints experienced at present by local producers.

2. Contributions of the RNRRS to increase the potential of UPA

This section aims to present the main outputs developed from the RNRRS with relevance to the *improvement* of UPA.

The section is structured in accordance to DFID’s new Strategy for Research on Sustainable Agriculture (SRSA), which recognises the need for three intertwined approaches. These approaches seem relevant and applicable to the Urban and peri-urban context, considering the types of constraints and potentials identified above.

- (i) **participation:** working with poor farmers to identify and tackle their key problems, which could include for the UPA context, such problems as poor market access, limited legal rights and tenure systems, lack of knowledge on improved agricultural practices and appropriate waste and waste water reuse; etc.
- (ii) **technology:** develop/promote clean drinking water systems, safe waste and waste water treatment systems, develop disease/pest tolerant varieties for high demand crops, develop compost systems for soil improvement, develop post-harvest crop treatment methods to eliminate residual levels of pathogens, develop cost effective vaccinations to protect livestock;
- (iii) **access:** improve and develop systems which enable poor people to hear about and choose from appropriate technologies and information, improve the enabling environment for urban agriculture and livestock keeping, establish linkages with existing extension services, increase general public awareness.

2.1 Participation

Several of the RNRRS projects relevant for the UPA have applied at least components of participation during their project life. However, the degree of participation and the sustainability of the process vary significantly as do the outcomes of these participation processes. One major problem which became apparent in the review of existing information is the lack of a clear identification of poor target groups and their specific potentials and constraints. As the emphasis on poor peoples livelihoods was only introduced with the “White paper” in 1997 many of the previous projects did not focus on the aspect of urban and peri-urban poverty.

Participation ranged from stakeholder consultation on pre-perceived problems (eg. CPHP R7519; FRP ZF 0136) to fully participatory research and development initiatives (eg. LPP ZC 0290) or consultation processes, which contributed to the establishment of multi-stakeholder groups such as the Kampala Urban Food Security, Agriculture and Livestock Coordinating Committee (KUFSALCC) (LPP ZC0282) and led to policy change (see section 2.3) . The majority of projects however remained in the consultative stage, the main objective being to identify urban agricultural activities and practices carried out by different stakeholders. The latter examples (LPP ZC 0290; LPP ZC0282), unfortunately the exception, have contributed to the formation of local informal institutions which can continue to encourage stakeholder participation and empower those living in poor communities to engage with local policy and planning processes and consultations.. This can be considered an important achievement taking into account that one of the key challenges of urban and peri-urban agriculture is the lack of visibility and voice of the poor producers in decision-making processes.

The table below summaries some of the projects which aimed at increased participation of the stakeholders involved.

Table 3 RNRRS projects with “Participation” focus

	No.	Title	Participation
CPHP	R7487	Improving the livelihoods of peri-urban vegetable growers through market promotion of fresh and processed indigenous vegetables	Farmer participatory variety selection and multiplication
	R7519	Pollution and health problems in horticultural production in Harare: The need for improved quality assurance systems (Zimbabwe)	Stakeholder consultation in problem identification
CPP	R8339	Effects of plant diseases on crop residues used for peri-urban dairy production on the Deccan Plateau	Farmer participatory variety selection and multiplication and establishment of village seed banks
FRP	ZF 0136	Researchable constraints to the use of forest and tree resources by poor urban and peri-urban households in developing countries	Stakeholder consultation in problem identification
LPP	ZC0290	Local Participatory Research and Development on Urban Agriculture and Livestock Keeping in Nakuru	Stakeholder involvement in research and development planning and implementation through NEFSALF
	ZC0282	Harmonisation of UA laws in Kampala	Establishment of city multi-stakeholder group through KUFSALCC

	R7321	Improving the market mechanisms, processing and marketing efficiency and reducing the public health risks in developing peri-urban smallholder dairy systems	Stakeholder consultation in problem identification
NRSP	R7099	Improved utilisation of urban waste by near-urban farmers in the Hubli-Dharwad city region	Information on farmers' preferences concerning soil amendments and on the constraints and opportunities presented by the use of urban waste as a soil amendment.
	R6799	Kumasi Natural Resource Management	Analysis of urban “gap” production

2.2. Technology

Another approach taken by many of the projects was the introduction/development of new technologies. From the information available at the time of this review, which was mainly based on Project Completion Summary Sheets and selected Final Technical Reports, there is currently insufficient evidence on the merits of the technologies and on how the technology choices were made. There is also little information available on the merits of the technologies or as yet on their expected impact on poor people’s livelihoods, and potential demand.

For instance a review of the NRSP R 7549 “Consolidation of existing knowledge in the peri-urban interface” project in Hubli-Dharwad concluded that: “There is little explicit information on the level of poverty, who the poor are and their livelihoods status. Given the lack of information about the poor indicated above, it follows that little is also known about the effects of urban development upon them, There is some knowledge about how solid and liquid wastes are used by peri-urban farmers, but an analysis of their level of poverty and how this is affected by access to such resources is unknown.”

In terms of the value of the technologies developed it concludes the following: “In Hubli-Dharwad, the only strategy option explored so far was the effect of application of composted and modified, sorted urban solid waste on a range of small scale farmers’ crops. Although this generated much useful knowledge about ways of collaborating with poorer farmers, the option explored was of limited use due to the expense of processing.”

This applies in varying degree for the other projects listed below. The available information on the use by and demand of specific target groups is in most cases very limited and the information on potential impact for resource poor urban dwellers non-existing.

Table 4 RNRRS projects with “Technology” focus

	No.	Title	Technology
CPHP/LPP	R7524	The use of oilseed cake from small-scale processing operations for inclusion in rations for peri-urban poultry and small ruminant production	Cost-effective feeding systems for poultry and goats
	R6304	Improving peri-urban horticultural productivity in sub-Saharan Africa	Nursery programme and crop rotation technology tested
	R7487	Improving the livelihoods of peri-urban vegetable growers through market promotion of fresh and processed indigenous vegetables	Identification of suitable vegetable varieties
AHP	R7596	Improving public health by controlling trypanosomiasis	Zoonoses management
	R7360	Helping poor farmers to control African	Compost preparation

		bovine trypanosomiasis by better use of drugs	technologies tested
	R7955	Integrated pest management of maize forage dairying in Kenya	Improved pest management strategies
	R8296	Sustainable approaches for management of root-knot nematodes on vegetables in Kenya	Biopesticides tested and scaling-up potential identified
LPP	ZC0265	Improved urban livestock production for effective and safe management of organic and other urban wastes in Kisumu City, Kenya	Identification of technologies for animal waste disposal and re-use, eg. for safe fuel
	R7524	The use of oilseed cake from small-scale processing operations for inclusion in rations for peri-urban poultry and small ruminant production	Cost-effective feeding systems for poultry and goats
NRSP	R6799	Kumasi Natural Resource Management	Technologies for soil fertility management and improved farming practises established
	R7099	Improved utilisation of urban waste by near-urban farmers in the Hubli-Dharwad city region	Techniques for improved utilisation of urban waste

2.3 Access

In the NRSP synthesis study (R 8491), the authors concluded that restricted information was a problem for rural people entering an urban economy, and that improving access helped them succeed with new livelihood activities. It seems their traditional or past knowledge is often not appropriate for producing unfamiliar food crops and selling them in the city, and they do not have sufficient information about the opportunities the cities may offer. This finding was supported by information obtained in a number of the LPP projects related to urban livestock keeping (eg. ZC 0201). Urban poor dweller seem to be faced by an institutional gap, with the rural extension services not working in urban areas and the urban institutions not dealing with agricultural (rural) issues. An LPP commissioned study implemented in Kenya, Bolivia and India targeted urban livestock keepers facing a variety of institutional failures, including the non-existence of functional advisory services and inadequate sanitation services and access to water (LPP R 8110).

The political environment in the cities for urban agriculture activities are in most circumstances prohibitive or at least non-encouraging for resource-poor farmers in general, which makes their already weak position even more precarious. The above mentioned study on urban livestock emphasised the existence of archaic bye-laws stating that keeping livestock in urban areas is illegal, (LPP R 8110).

Within the RNRRS a number of projects have contributed to generate basic information which demonstrates the existence and relevance of urban agriculture for the urban poor. This may be the main contribution the projects can make to future research and development activities in this field. Bringing different urban stakeholders together to discuss options, potentials and threats may have contributed in some cases to a change of existing attitudes and by-laws. A concrete example for this achievement is provided by LPP (ZC0282, ZC0278). The Kampala Urban Food Security, Agriculture and Livestock Committee was set up in 2004. Its members, from university, public and civil society

organisations including the Kampala City Council, are concerned to promote the availability of healthy and safe food or Kampala, and are actively involved in research, policy dialogue and public awareness. They participated actively in a policy change process which resulted in a review and update of the bye laws regulating urban food production and food safety.

Table 5 RNRRS projects with “Access” focus

	No.	Title	Access
CPHP	R7528	Improving quality assurance systems for fresh fruits and vegetables produced by peri-urban resource poor farmers in Zimbabwe	Information provision for relevant stakeholders
	R7519	Pollution and health problems in horticultural production in Harare: The need for improved quality assurance systems	Information provision for relevant stakeholders
LPP	ZC0282	Harmonisation of local and national policies that affect Urban and Peri-Urban Agriculture and Livestock keeping in Kampala	User friendly guidelines based on these ordinances are being pilot-tested
	R8110	Livestock and urban livelihoods: Developing appropriate extension dialogue with the landless	Interactive learning aids for local communities on animal health and husbandry; Community groups of poor livestock keepers formed in four slums in Nairobi;
	ZC0278	How to effect Policy Change and Implementation in Urban and Peri-urban Agriculture and Livestock Keeping	Application of simple user guidelines on the new City Council Ordinances in Kampala.
	ZC0201	Urban livestock keeping in East Africa	Stakeholder consultation process established and maintained;
AHP/LPP	R8152	Dissemination of animal health knowledge for landless Indian dairy cattle owners under the Dissemination and Delivery of Animal Health Knowledge theme is one that has specifically looked at peri-urban farmers in India	Development of an interactive touch-screen information kiosk to be accessed by landless livestock keepers.
AHP	R8213	Including Voices of the Poor	Development of an integrated, animal health prioritisation framework, which is directly based upon the issues and problems outlined by the poor livestock keepers
	R7360	Helping poor farmers to control African bovine trypanosomiasis by better use of drugs	Education of farmers in appropriate use of trypanocidal drugs through the development and distribution of posters and leaflets
CPP	R8341	Promoting the adoption of IPM in vegetable production (Kenya)	New vegetable IPM Instructor's Resource Kits were developed and used to train sixteen trainee IPM instructors
	R8312	Promotion of quality vegetable	A suitable model for a sustainable kale

		seed in Kenya	seed multiplication system that enables smallholders to produce healthy, good quality seed of an acceptable market value has been identified
	R8297	Development of private sector service providers for the horticultural industry in Kenya	Training created awareness and facilitated some outgrowers groups to comply with market requirements. At policy level, awareness of the plight of the small scale farmers in respect to new food standards has prompted some of the standard setters to review the requirements, making them more end-user friendly
NRSP	R7872	Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface	Actors and stakeholders enabled to better understand benefits derived from these activities and facilitated institutional dialogue on developing peri-urban NR management strategies that benefit the poor

3. Conclusions

The information compiled in this review has remained at quite a general level. This is partly due to the fact that the comparatively small number of projects addressed by the 6 RNRRS programmes was very diverse in nature which made it difficult to aggregate project outcomes at a higher level. Also, the variable reporting format of the projects made it difficult to distil the relevant information from a poverty impact perspective.

Nevertheless there are several important conclusions which can be drawn from these findings:

- Several of the projects enabled a situation analysis to be undertaken in terms of potentials and constraints of urban and peri-urban agriculture. This analysis demonstrated that urban and peri-urban agriculture creates opportunities for poor people to generate income and improve livelihood security; at the same time, these activities can adversely affect existing livelihoods, particularly on the very poor. It is noticeable that the main focus of the projects was on peri-urban agriculture, leaving an information gap on the urban situation; this gap needs to be urgently addressed by research since the process of urbanisation will continue and slowly convert today's peri-urban areas into urban spaces.
- The different RNRRS projects have produced outputs relevant to the three approaches outlined by the SRSA. Contributions have been made towards participation, technology development and access. Several of the project outcomes especially developed under "Technology" have a potential to be scaled-up in urban areas. However, one could argue that only if the three pillars are addressed together will a meaningful contribution be achieved. Improved technology in an overall prohibitive urban environment, without institutions promoting the use of these technologies, will not result in major impact. Equally any intervention, which departs from a thorough analysis of the target group's needs and demands (poor urban dwellers) is unlikely to achieve major impact.
- The fact that very few of the RNRRS projects emphasised the existence and relevance of urban agriculture for the poor in a context of a general growing awareness of its presence and

potential shows that there is a need for awareness raising and lobbying within the research community, both donors and implementers. Several recent events, such as the social unrest caused through slum evictions and resettlement policies (eg. in Zimbabwe and Kenya) and the outbreak of bird flu in Asia and more recently in West Africa are timely reminders of the importance to mainstream urban development into existing research and development activities. While slums in any city are not a desirable policy objective, their existence in many cities is currently unavoidable and can have unforeseen benefits. For instance, they are often the first stopping point for rural-to-urban migrants; they provide low-cost affordable housing that enables the new migrants to save enough money for their eventual absorption into urban society. In addition, the inhabitants of these slums provide the major labour force involved in the more menial yet vital tasks required in the maintenance of safe and vibrant towns and cities in the developing world. In-situ slum upgrading is a far more effective solution to improving the lives of slum dwellers than is resettlement (UN Habitat, 2003). Appropriate management strategies for urban agriculture have the potential to contribute to this upgrading process.

List of acronyms used in this document

DFID	Department for International Development (UK Government)
NRSP	Natural Resources Systems Programme
LPP	Livestock Production Programme
AHP	Animal Health Programme
CPHP	Crop Post-harvest Programme
CPP	Crop Protection Programme
FRP	Forestry Research Programme
UPA	Urban and peri-urban agriculture
PUI(s)	Peri-Urban Interface(s)
RNRRS	Renewable Natural Resources Research Strategy
SRSA	Strategy for Research on Sustainable Agriculture

References

Birley, M. and Lock, K. (1999) The Health Impacts of Peri-urban Natural Resource Development. International Centre for Health Impact Assessment , Liverpool School of Tropical Medicine

Brook, R.M. and Dávila, J.D. (eds.) (2000) The peri-urban interface:a tale of two cities. School of Agricultural and Forest Sciences, University of Wales and Development Planning Unit, University College London

Fuller , R. (2003) Livestock and the Livelihoods of the Urban Poor: a background document. Livestock Development Group, University of Reading, UK. 76 pp.

Gregory, P. (2005) A Synthesis of peri-urban research of Kumasi, Hubli-Dharwad and Kolkata PUIs, NRSP, Final Report R 8491

Gündel, S. (2002) Peri-urban and urban livestock keeping in East Africa - a coping strategy for the poor? Scoping study July 2002. Natural Resources International Limited, Aylesford, UK. 31 pp.

Ishagi, N, Ossiya, S., Aliguma, L and Aisu, C (2002) Urban and peri-urban livestock keeping among the poor in Kampala City. Ibaren Konsultants, Kampala, Uganda.

Ishani, Z,; Gathuru, P. K., and Lamba, D (2002) Scoping study of urban and peri-urban poor livestock keepers in Nairobi. Mazingira Institute, Nairobi, Kenya

Lupala, A (2002) Scoping study on urban and peri-urban livestock keepers in Dar es Salaam City. University College of Lands and Architectural Studies (UCLAS), Dar es Salaam, Tanzania

Onim, M (2002) Final report of scoping study for urban and peri-urban livestock keepers in Kisumu City, Kenya. Lowland Agricultural and Technical Services Limited (Lagrotech), Kisumu, Kenya

Tegegne, A., Tadesse, M., Alemayehu, M, Woltedji, D and Sileshi, Z (2002) Scoping study on urban and peri-urban livestock production in Addis Ababa, Ethiopia. International Livestock Research Institute and Ethiopia Agricultural Research Organization, Addis Ababa, Ethiopia

The Challenge of Slums: Global Report on Human Settlements 2003; Published by Earthscan Publications Ltd., for and on behalf of the United Nations Human Settlements Programme (UN-Habitat)

Urban Livestock in East African cities 2005-LPP/IDRC commissioned Video Clips from Mathare and Kibera(Nairobi), Kisumu, Nakuru and Kampala (ISBN 0-9553595-2-5).