

Small homegarden plots and sustainable livelihoods for the poor



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Livelihood Support Programme (LSP)

An inter-departmental Programme for improving support for enhancing livelihoods of the rural poor.

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The Livelihood Support Programme

The Livelihood Support Programme (LSP) evolved from the belief that FAO could have a greater impact on reducing poverty and food insecurity, if its wealth of talent and experience were integrated into a more flexible and demand-responsive team approach.

The LSP, which is executed by FAO with funding provided by DfID, works through teams of FAO staff members who are attracted to specific themes being worked on in a sustainable livelihoods context. These cross-departmental and cross-disciplinary teams act to integrate sustainable livelihoods principles in FAO's work, at headquarters and in the field. These approaches build on experiences within FAO and other development agencies.

The programme is functioning as a testing ground for both team approaches and sustainable livelihoods principles.

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Access to natural resources sub-programme

Access by the poor to natural resources (land, forests, water, fisheries, pastures, etc.), is essential for sustainable poverty reduction. The livelihoods of rural people without access, or with very limited access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating other assets, and recuperating after natural or market shocks or misfortunes.

The main goal of this sub-programme is to build stakeholder capacity to improve poor people's access to natural resources through the application of sustainable livelihood approaches. The sub-programme is working in the following thematic areas:

1. *Sustainable livelihood approaches in the context of access to different natural resources*
2. *Access to natural resources and making rights real*
3. *Livelihoods and access to natural resources in a rapidly changing world*

This paper contributes to the first thematic area by examining ways in which the poor can use small amounts of land to establish homegardens to advance important livelihood objectives. Where land is scarce, access to even small plots can benefit families by improving nutrition, providing a source for additional household income, and enhancing the status of women in the household.

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1. INTRODUCTION

The paper examines ways in which the poor can use small amounts of land to establish homegardens to advance important livelihood objectives. The paper considers the potential benefits of homegardens in light of policy, financial and cultural constraints, and provides a framework for planners to consider whether (and which) homegarden interventions are appropriate for improving livelihoods of the poor.

In many settings in the developing world, lack of access to land may be the most critical obstacle to creating homegardens useful to the poor. Land is a critical resource for most families in the world. Land has inherent value, and land can be a critical component in the creation of value. Even relatively small plots of land substantially supplement the physical, financial and nutritional security of poor households. Land is an important basis for identity and status of individuals within a family and of families within a community. Land can also be the foundation for political power (Agarwal 1994, Deere and Leon 2001, Mearns 1999). As such, programmes that allocate small plots of land for homegardens can provide benefits far beyond those derived directly from the homegardens.¹

The paper is divided into three main sections. Within the context of the sustainable livelihoods analysis, the second section of the paper examines the benefits that homegardening may bring to the poor. The third section discusses various factors bearing upon the establishment of new homegardens and the improvement or expansion of existing homegardens. The fourth section of the paper discusses policy and programme considerations from the perspective of planners evaluating various strategies for using homegardens to address sustainable livelihood objectives.

1.1 Sustainable livelihoods

Sustainable livelihoods analysis provides a framework for examining the significant role homegardens and homegarden plots play in the livelihoods of the poor. The sustainable livelihoods approach focuses on the capabilities of people, and highlights interrelationships among people and the assets they develop and on which they rely. The analytical process focuses on the strengths of people and their aspirations as they pursue their livelihood objectives.

A livelihood comprises the capabilities, assets, and activities required for a means of living. A livelihood is sustainable when it can cope

¹ The concept of allocating house-and-garden plots to landless labourers as a second-best (and more feasible) alternative to traditional land reform approaches has been gaining ground in India, as evidenced by India's recently adopted Tenth Five-Year Plan:

“Access to even small pieces of land which may not be sufficient for providing income to a family for subsistence can significantly reduce poverty and food insecurity by providing an essential component in a diversified livelihood system.” (Government of India, 2002,; sec. 3.2.57); and

“Ownership of even a small plot of land enables a family to raise its income, improve its nutritional status, have access to credit facilities and lead a more dignified life. . . . Horticulture, floriculture and vegetable cultivation on small plots of land, including homestead land, have proved beneficial for the poor. Agricultural labourers, therefore, need to be provided access to land to improve their economic and social well-being.” (Government of India, 2002,; sec. 3.2.71).

with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Carney 1998: 4).

The sustainable livelihoods approach seeks to increase the sustainability of the lives of the poor by promoting six core objectives: (1) more secure access to, and better management of, natural resources; (2) more secure access to financial resources; (3) a policy and institutional environment that supports multiple livelihood strategies and promotes equitable access to competitive markets; (4) better nutrition and health; improved access to high quality education, information, technologies, and training; (5) a more supportive and cohesive social environment; and (6) better access to basic and facilitating infrastructure (DFID 2001).²

Within this framework, homegardens, and particularly homegarden plots, can play many roles. Secure access to a homegarden plot can be a livelihoods objective. Homegardens are also a natural asset through which other livelihood objectives, such as gender equality and sustainable use of resources, may be achieved. In addition, land can be a route or opportunity through which a multitude of other assets become accessible to the household (Baumann 2002). Access to land sufficient to establish a homegarden can enable a household to produce foods for consumption or trade. Skills learned in production increase the family's human assets. Consumed foods improve the family's nutritional status and food security. Sale of foods improve the family's financial status. Trade, exchange of information and cooperation with other villagers strengthens the family's relationships with others.

The sustainable livelihoods approach also recognizes that policies, institutions, and processes influence access to and use of assets, which ultimately impacts livelihoods. For example, land law, government land policies, government and customary institutions, as well as factor and product markets will impact whether a family can access and productively use a plot of land that is large enough and otherwise suitable to create a homegarden.

1.2 Homegardening in world practice

Homegardens have usefully been defined as “a small scale, supplementary food production system by and for household members that mimics the natural, multi-layered ecosystem.” (Hoogerbrugge and Fresco 1993). Homegardens appear to have developed independently in the Indian subcontinent, Indonesia and other parts of Southeast Asia, the tropical Pacific islands, the Caribbean, and various parts of tropical Latin America and Africa (Brownrigg 1985, Landauer and Brazil 1990), and “can be found in almost all tropical and subtropical ecozones where subsistence land-use systems predominate” (Nair 1993: 86). Temperate climate homegardens were

² Underlying the sustainable livelihoods approach is the theory that people draw on a range of capital assets or poverty reducing factors to further their livelihood objectives (DFID 2001). Assets are categorized as social, human, natural, physical, financial and political, and may serve both inputs and outcomes (Baumann and others 2001). Various vulnerability factors over which people have little or no control (such as environmental disasters and political unrest) impact the assets. Assets are also filtered through policies, institutions, and processes that determine the degree to which the people's livelihood objectives are realized (DFID 2001).

important for many years in the USSR and continue to provide an important safety net for families in the successor nations of the region (e.g., the Seeth et al 1998).

Published analyses of homegardens generally refer to four identifying characteristics (Brownrigg 1985). First, the garden is located near the residence. Second, the garden contains a high diversity of plants. To this criterion some add that the garden recycles nutrients in a sustainable manner, that plants are planted densely, and that plants are layered to mimic natural forest. Third, garden production is a supplemental rather than a main source of family consumption or income. Fourth, the garden occupies a “small” area.

The issue of homegarden size is particularly important for our analysis. Although most commentators identify homegardens as occupying “small” plots, this criterion is applied to a wide range of plot sizes, varying from a few square meters to more than one hectare.³ Because the purpose of this paper is to examine the ways in which poor households can obtain and beneficially use homegarden plots, we focus here on homegarden plots falling on the smaller end of the range. If limited public resources are to be used to provide the poor with land for gardening, the size of parcels distributed will determine the number of households benefitted.

A fifth distinguishing characteristic of homegardens that is important to our analysis is offered by Marsh (1998), who states that homegardens are a production system that the poor can easily enter at some level since it may be done with virtually no economic resources, using locally available planting materials, natural manures and indigenous methods of pest control. To the extent a poor family can afford to make beneficial use of homegarden plots, the plots are more likely to make a sustainable contribution to the family’s livelihood objectives.

³ On Java, the great majority of homegarden plots are smaller than 200 m² (Prosterman and Mitchell 2002), while on other less densely populated Indonesian islands they average 2,500 m² and can reach sizes of 3 hectares (Christanty 1990). In Bangladesh, homegarden sizes range from 30 to 700 m², with an average size of 200 m² (Christanty 1990).

2. BENEFITS OF HOMEGARDENS

Homegardens are believed to provide a number of benefits to families, ranging from improving nutrition and providing a source for additional household income, to improving the status of women in the household. Potential environmental benefits of homegardens may be important not only for homegardening households, but for the broader society as well. Where the creation of homegardens includes distribution of land to otherwise landless and land-poor families, families are believed to benefit in several additional important ways, including improved family status and improved bargaining power over wage income (see Box 1). This section surveys various ways in which homegardens may contribute to improving the livelihood of poor families.

2.1 Plantings and family health

It has been established that even moderate and mild energy malnutrition contributes to child mortality, and micronutrient deficiencies are associated with increased risk of child and maternal mortality (Kiehl 2001). It is estimated that, worldwide, 53 percent of the approximately 10 million child deaths every year can be attributed to malnutrition (Black et al 2003). Vitamin A deficiency is the leading cause of preventable childhood blindness, and is associated with an increased risk of mortality and an increased severity of infectious diseases (Bloem 1996). Improved family nutrition and health is a key objective of the sustainable livelihoods framework.

Homegardens are one strategy for addressing malnutrition and micronutrient deficiencies. Even though animal products are the best sources of micronutrients, vegetables and fruits may be the only source of micronutrients that are reliably available to poor households (Talukder et al 2000, Bloem et al 1998, Reddy 1995). A number of studies have reported that homegardens produce a high percentage of fruits and vegetables consumed by homegardening families.⁴ Although it is relatively straightforward to determine whether a homegardening programme has increased production and consumption of fruits and vegetables, it is not a simple matter to determine the impact of homegardening on nutritional status (HKI/AP 2003).⁵ Nevertheless, a number of studies have concluded that homegardens are associated with better household nutrition.

⁴ Sri Lankan homegardens have been reported to produce 60 percent of leaf vegetables and 20 percent of all vegetables consumed by the household (Hoogerbrugge and Fresco 1993, citing Ensing and others 1985). Others have reported that homegardens typically produce more than 50 percent of vegetables, fruits, medicinal plants and herbs consumed by the household (Marsh 1998). The bulkiness of fresh fruits and vegetables favors their consumption near the production site, especially where the infrastructure is least adequate to allow transport of rural crops to cities (Vasey 1990).

⁵ The presence of parasites in the population studied can greatly influence the degree to which people are able to absorb vitamins present in consumed fruits and vegetables (HKI/AP 2003). It is also difficult to control for the influence of socio-economic status. A study in Bangladesh found that children living in households with a homegarden were less likely to have eye diseases associated with lack of vitamin A than children living in households without a homegarden; specifically, children from households without a homegarden were 2.5 times more likely to be nightblind, 2.1 times more likely to have Bitot's spot, 3.4 times more likely to have active corneal lesions and 2.4 times more likely to have corneal scars. However, the study also found that children of poor households were likely to experience similar risk ratios for the same afflictions, making it unclear whether the availability of homegarden produce or other factors, such as foods purchased by the higher earning families, accounted for the observed differences in eye health (Cohen and others 1985, cited in HKI/AP 2001).

Box 1. Benefits of owning a house plot.

For otherwise landless families, ownership of a plot used for construction of a house and establishment of a homegarden can provide numerous livelihood benefits beyond those derived directly from the homegarden itself:

1. *Place for residence.* Although perhaps the most obvious, this benefit should not be overlooked when millions of households lack secure rights to land for a house. Secure legal rights to the plot also provide the family with proper incentives to construct a quality house and make other long-term improvements to the plot.
2. *Status.* Studies in India indicate that recipients of government-allocated house plots cite increased status as the most important benefit from the plot (more important even than increased income and food consumption) (Hanstad et al 2002).
3. *Wealth generation.* House plots and occupying structures are typically the most important source of wealth of poor households. As these poor households build and improve their house, build other structures (cattle sheds, wells, fences, wells, etc.), plant trees, and make other labour-intensive improvements to their plots, they create wealth for themselves. Households who lack secure rights to sufficiently-sized house plots are constrained in developing their asset portfolio.
4. *Bargaining leverage in labour markets.* Agricultural labourers who do not own their own house site often rely upon their employers for a place to live. This often creates a dependency relationship that severely limits the labourers' bargaining leverage for wages. We interviewed a group of landless women in Madhya Pradesh state in India who had been living on their landlord's land for decades. Although they did not pay rent, the landlord paid them only 50 percent of market wage rates, did not allow them to work for other farmers, and at times even prevented them from leaving or entering their homes.
5. *Post-harvest activities and storage.* In many settings, the homegarden plot is the site for important post-harvest activities such as drying and threshing. The plots also typically provide space for storing food, tools and other capital assets.
6. *Non-agricultural income generation activities.* Owning a homegarden plot with some extra space can enable poor households to pursue other non-agricultural production, service or retailing activities such as handicraft production, blacksmithing or petty shops.
7. *Access to credit.* In a study of government-allocated house-and-garden plots in Karnataka, India, more than one third of respondents reported that obtaining the plot had increased their access to credit and nearly one quarter reported actually receiving credit as a result of owning the plot (Hanstad et al 2002).

A large-scale homegardening project implemented by Heller Keller International in Bangladesh found that families who grew more fruits and vegetables, and families who grew a larger variety of fruits and vegetables, were likely to have a higher intake of vitamin A (HKI/AP 2001). A study of homegarden consumption in rural Bangladesh found that fruits and vegetables were the most important factor associated with higher intake of vitamin A by women of reproductive age, that consumption of fruits and vegetables contributed more to vitamin A intake than consumption of animal products, and that the number of varieties of fruits and vegetables produced in the homegardens was significantly associated with a higher vitamin A intake (Bloem 1996). The fact that the highest intake of vitamin A was associated with homegardens that were divided into several scattered plots, even though such scattered plots were cultivated by the poorest families, may suggest a tendency of the poorest households to make the most efficient use of the limited resources available to them (Bloem 1996).

Food-based approaches to combating vitamin A deficiency disorders have several advantages over other strategies, such as distribution of vitamin tablets: (1) homegardening programmes allow benefits to reach everyone in the family, not just young children or some other particular group; (2) homegardening programmes can be sustained by households and communities, reducing reliance on outside agents; and (3) homegarden fruits and vegetables can provide other nutritional benefits, helping to prevent degenerative diseases and mortality (HKI/AP 2003). A successful homegardening strategy places the poor at the center of decision making over how best to satisfy their livelihood objectives, and makes them less reliant on outside forces.

In addition to their usefulness in combating vitamin A deficiency, homegardens are associated with a number of other nutritional benefits, some of which have tended to be overlooked (Marsh 1998). Homegardens have been reported to provide 18-40 percent of household calories on Java (Christanty 1981 and Stoler 1978, cited in Hoogerbrugge and Fresco 1993) and 50–58 percent of the recommended daily allowance for calories in the Philippines (Sommers 1978, cited in Christanty 1990).⁶ In Lima, women who must feed a large household are reported to value production of starchy crops such as sweet potato, taro and maize, which have a high energy value and high “filling” quality (Ninez 1985). This comports with the findings of Hoogerbrugge and Fresco (1993), who state that homegardens primarily produce energy foods rather than vitamins, and that vegetables and fruits play a relatively minor role in classic homegardens; they suggest that it is a mistake to promote homegardening as vegetable and fruit gardens alone.

Homegardens can provide important protections against family food insecurity. On Java, climatic conditions mean that owners of homegardens have something available to harvest throughout the year, either for consumption, for home industry or for sale, and this availability is especially important to the economic stability of poor

⁶ There appears to be a wide range of experience, however, regarding the homegarden's contribution to total calories consumed. For example, researchers in Sri Lanka have reported that homegardens produce over 80 percent of staples consumed (Hoogerbrugge and Fresco 1993, citing Ensing and others 1985), while homegardens in urban Papua New Guinea have been estimated to produce 4-6 percent of household food energy needs (Vasey 1985).

households, particularly during the period between rice harvests (Soemarwoto 1985). A detailed study of Russian households concludes that for the very poorest households, which account for approximately 20 percent of all Russian households, “gardening is absolutely necessary, serving as insurance against food insecurity” (the Seeth et al 1998: 1621). Homegardens may become the principal source of household food and income during periods of stress, as in Kampala, Uganda after the civil war, where urban agriculture is reported to have substantially fed the city (Marsh 1998). In the context of a study of land-poor households in Kerala, India, homegardening production has been observed to have a “buffering effect” on household consumption when there are shortfalls in wage income (Kumar 1978).

2.2 Animals and family health

With the increasing awareness among nutrition experts that fruits and vegetables contribute less to improved vitamin A status than previously assumed, the focus of homegarden programme has begun shifting to include analysis of the benefits of animal husbandry, poultry and fishponds (HKI/AP 2001).⁷ Animal husbandry extension projects underway in Nepal, Cambodia (poultry and eggs) and Bangladesh (poultry, eggs and fish) promote household egg production by introducing improved breeds of birds that produce more eggs, along with vaccinations and assistance with proper housing and feed, promote improved grass fodder and deworming tablets for milk cows, and are introducing fast growing fish cultivars and plant sources of fish feed (HKI/AP 2003).

Homegardens on Java have been reported to provide 14 percent of household protein requirements (Hoogerbrugge and Fresco 1993, citing Christanty 1981). A study of homegardens in Ghana found that households could potentially produce substantial amounts of meat and related income per year (Asare et al 1990).⁸ Certainly in India it is very common to combine gardening with poultry and livestock on the homegarden plot. Typically the household ties up, fences in or keeps the animals in a shed located on the plot. The household uses manure as fertilizer for the garden and as fuel source. In Javanese homegardens, animals are not confined and receive only minimal feeding – chicken range freely and eat leftovers from the kitchen and “whatever they can find in the garden,” while buffalo, cows, goats and sheep graze on village common lands and are fed additional food at night from grasses cut from dykes of rice fields and other areas (Soemarwoto 1985).

To date there is very little written regarding dietary intake and nutritional status of children in households that integrate production of fish, small animals and vegetables (Schipani 2002). However, a survey in Bangladesh that found that, even after accounting for household socioeconomic status, young children in households that raised chickens in the homegarden had the lowest incidence of nightblindness (as

⁷ Vegetables and fruits produce less bioavailable beta-carotene than previously assumed, and the amount produced varies widely, which means that consumption of vegetables and fruits is not as likely to improve vitamin A status as previously thought; therefore, programmes that promote consumption of dark green leafy vegetables are likely to have a more modest impact on vitamin A deficiency disorders (HKI/AP 2001, de Pee and others 1995).

⁸ Households produced ranging from 180 kg of meat worth US\$429 for goats, to 2,700 kg of meat worth \$4,286 for pigs; livestock rearing on homegardens was widespread, with 40 percent of surveyed households raising poultry, 34 percent raising sheep, 62 percent raising goats, 10 percent raising pigs, 6 percent raising cattle and 2 percent raising rabbits (Asare and others 1990).

compared to households not raising poultry, or raising poultry without a homegarden) (HKI/AP 2001, citing Kiess 1998).⁹

Families who raise animals use the homegarden plot as a place to keep the animals, either throughout the day, or only at night after the animals return or are brought back from foraging. The homegarden thus serves not primarily as a source of fodder for animals (and may not be the main source of fodder for most households), but is a place for keeping animals. A study of homegardening households in Karnataka, India found that 93 percent of households who had livestock kept their livestock on their homegarden plot exclusively, while a similar study of homegardening households in West Bengal found that 90 percent of respondents with livestock kept them on the homegarden plot at least part of the time (Hanstad 2004). These percentages would be even higher if poultry were included.

2.3 Household income

The livelihood benefits of homegardens go well beyond those related to nutrition and subsistence. In many cases, the sale of products produced on homegardens significantly improves the family's financial status.

It is a common misconception that homegardens are exclusively subsistence-oriented, whereas in fact homegardens provide households with cash crops as well as food crops (Hoogerbrugge and Fresco 1993). In fact, returns to land and labour are often higher for homegardens than for field agriculture (Marsh 1998). Homegardens can contribute to household income in several ways. The household may sell products produced in the homegarden, including fruits, vegetables, animal products and other valuable materials such as bamboo and wood for construction or fuel. The household may use the homegarden site to conduct cottage industries to produce crafts or small manufactures that can be sold (Marsh 1998).

The volume of homegarden production actually sold appears to be highly variable, with studies reporting that between nine percent and 51 percent of production is sold (Hoogerbrugge and Fresco 1993). Urban homegardens in Papua New Guinea are reported to have expanded over a period of several years (in one neighborhood from a mean area of 125 m² in 1974 to a mean area of 817 m² in 1981), which the households attributed to opportunities to sell homegarden produce in local markets (Vasey 1985). In the studied sample, 42.1 percent of squatter households sold homegarden produce at the market, as compared to a district average of 25.8 percent, indicating that the more impoverished households depended on homegardens more than the average (Vasey 1985).

Livestock and tree crops produced on homegardens in southeastern Nigeria accounted for over 60 percent of family cash income in one study (Okigbo 1990). A study of

⁹ A study of child nutrition among homegardening families in Thailand demonstrates how difficult it is to study causation. Although the study found that children of households that raised fish in addition to growing vegetables were taller and heavier than children of households that only grew vegetables, it was impossible to ascribe this result to the introduction of the fish since the same differences were found even in older children of the households, and it was deemed extremely unlikely that the recent addition of fish to the diet could have reversed earlier nutritional deficits in the older children. In addition, because the families raising fish were slightly better off financially than the control group, the control group was deemed inadequate (Schipani 2002).

urban and rural households in three Russian provinces found that two-thirds of all households obtained some income from agricultural home production, and in rural areas the market value of home production (computed using average local prices reduced by calculated market transaction costs) exceeds household labour income (tho Seeth et al 1998).¹⁰ In the Helen Keller International (HKI) pilot homegarden project in Bangladesh, 54 percent of households reported selling homegarden products and earning the cash equivalent of 14.8 percent of total average monthly income (HKI/AP 2003).

In addition to direct earnings from sale of homegarden production, production consumed by the household frees up household earnings for other purchases. In the Bangladesh HKI homegarden project, the income value of homegarden production increased from 14 percent of average monthly income to 25 percent after taking into account purchased fruits and vegetables (Marsh 1998).

In some cases, a portion of the cash income from homegardens is used to purchase additional food for household consumption. A study of urban homegardens in the Philippines revealed that homegardening families spend less on food than non-gardening families, while homegardening families who plant a larger number of varieties of fruits and vegetables spend even less (Miura 2003).

In Cambodia and Nepal, 31-65 percent of income (31 percent in the case of Nepal and 65 percent in the case of Cambodia) derived from sale of poultry raised on homegardens was used to purchase other foods, while other proceeds were used to invest in production, education, savings and other purposes (HKI 2003). Urban homegardeners in Papua New Guinea sell various fruits at local markets and obtain cash that allows them to purchase rice that produces several times the food energy of the sold fruits (Vasey 1985). Thus, homegardens provide households with a number of options by which they can satisfy their livelihood objectives, and each household can determine for itself what combination of consumption, trade and sale of homegarden production best fits its livelihood strategy.

2.4 Wage security and household status

Ownership of the homegarden plot can make important contributions to improved and sustainable livelihoods in ways that often overlooked, including improved leverage in labour markets, enhanced social status and greater political participation.

One objective to providing ownership to house and garden plots in some settings is to free agricultural labourers (or other wage labourers) from exploitive land-labour linkages. In the 1940's the Puerto Rican government distributed small homestead plots of between half an acre and one acre to the families of agricultural labourers. The idea behind the law was, in the words of Section 241 of the law, that it is a

“fundamental human right of all the human beings who live exclusively by the tilling of the soil, to be the owners of at least a piece

¹⁰ In rural areas studied, home production on plots near the home, the average size of which was approximately 3600 m², accounted for 48.3 - 72.5 percent of household income, while income from gardening in towns and cities was considerably less, accounting for 0 - 18.04 percent of household income (tho Seeth and others 1998).

of land which they may use to erect thereon . . . their own homes, thereby delivering them from coercion and leaving them free to sell their labour through fair and equitable bargaining.” (28 L.P.R.A. (1955), quoted in Rosenn 1963: 344).¹¹

Roughly 50,000 families are reported to have received homestead plots under the law, which is further reported to have provided a degree of “peace and spiritual satisfaction” to the families (Pico 1964). Access to small plots of land also allowed the agricultural labourers to participate in elections without selling their votes to the landlord.¹² Several states in India have provided ownership of (typically) small house plots to agricultural labourer families in order to remove them from feudal-type dependence on employers on whose land they had been living.

Households who own the plot on which their home is constructed also enjoy an immediate increase in status within the village. A survey of rural households in Karnataka, India revealed that among households that had received small plots to construct homes and gardens, increased status within the village was the most cited benefit of ownership, surpassing even income and nutrition benefits; poorer households cited increased status even more often than other households (Hanstad et al 2002). In West Java, homegardens are an important symbol of social status, and households who are forced to build their house on homegardens owned by others are considered to be low status (Ahmad et al 1980, cited in Soemarwoto 1987). Increases in household status not only provide psychological benefits to household members, but are believed to provide households with better access to trade relations within the village, as well as better access to government programmes serving village households.

Describing the role of homegardens in the Saraguro community of Ecuador, homegardens were observed to “make a contribution far greater than that to diet, ritual life and remedy; the gardens are themselves a manifest representation of the community’s most deeply held values: autonomy, status, religious piety, and personal investment in family” (Finerman and Sackett 2003: 477). In Java, urban homegardens function as a status symbol and expression of the owner’s self-image and aesthetic sense, while unfenced rural homegardens can provide a social place for neighbors to socialize and children to play (Christanty 1990). Homegardens are thus seen to contribute to a cohesive social environment, another core objective of the livelihoods approach.

2.5 Benefits to women

Although women’s labour constitutes an important input, it is a mistake to conclude that homegardening is a primarily a female activity (Hoogerbrugge and Fresco 1993). In fact, the role of women varies widely among cultures. In Africa most

¹¹ Although the plots averaged from one-half to one acre initially, subsequent amendments allowed for distribution of parcels smaller than one quarter of an acre near urban areas and more than three acres in unfertile rural areas (Rosenn 1963, quoting 28 L.P.R.A. (1955), secs. 552, 554).

¹² “Now, the workers vote as they want and not as the landowner wants. . . . The landowners finally realized that labourers had rights that must be respected and the workers realized that selling their votes to the landowners not only was immoral but very bad business. Democracy started to function then and there, a real revolution occurred in the electoral process in Puerto Rico.” (Pico 1964: 153).

homegardening tasks seem to be performed by women, in Sri Lanka women provide labour only at peak times, in Indonesia men prepare the land, cultivate tree crops and market homegarden production, while women and children cultivate annual crops (Hoogerbrugge and Fresco 1993). Women do most of the work in Bangladeshi homegardens (Talukder et al 2000), as well as on Russian home production plots, including working the land, planting, weeding and carrying irrigation water, which requires considerable effort and time (tho Seeth et al 1998). However, in traditional settings, any member of the household can be found in the garden, and adult men and women, children and the elderly often have specialized roles in homegardening (Brownrigg 1985).

The role of women in homegardening may be socially determined, as is apparently the case among the Saraguro people of Ecuador, where homegardens are the exclusive domain of women; women decide what to plant and when to harvest, decide how to exploit homegarden resources, make decisions on sales of production and perform daily maintenance (Finerman and Sackett 2003). Or the role of women may be a function of other factors, as in Papua New Guinea, where although women were identified as 61.9 percent of gardeners and 66.7 percent of principal gardeners in urban areas (Vasey 1985), this fact was attributed to household composition and the secondary status of women in the workforce rather than gender (Vasey 1985, 1990).

Even where women play a primary role in homegardening, it can be important to involve the entire family in projects to promote homegardening, especially in cultures where women have little contact with outsiders and may hesitate to become involved in projects without the approval of their husbands (Marsh 1998).

Sales of homegarden produce may be one of the only sources of independent income for women, and such sales may be an important source of income for women (Marsh 1998). Finerman and Sackett (2003) report that having an abundant homegarden is an important source of status for Saraguro women, and conclude that homegardens demonstrate the woman's freedom from dependence on vendors and neighbors, her ability to expend resources on developing the garden demonstrate her fiscal standing, her production of flowers to adorn the church demonstrates her piety, and her investment in cultivation demonstrates her devotion to family.

Where women control homegarden resources, this may improve household nutrition, especially nutrition of children (Kumar 1978, Talukder et al 2000). In the urban homegardens of Lima, whereas men gardeners typically are interested in producing crops that have a high market value, women gardeners tend to want to produce food for family consumption (Ninez 1985).

In at least some cultural settings, education and information may play an important role in determining the degree to which women control homegarden production. In a study of an HKI pilot homegarden project in Bangladesh researchers found in participating households, 65 percent of the time women made decisions about distribution of garden produce for consumption or sale, as compared to 25 percent of the time in non-participating households, and women in participating households received and controlled the income from sales of garden production 67 percent of the time, as compared to 31 percent of the time in non-participating households (Marsh 1998).

2.6 Environmental benefits

Diversity of plant species and the layered canopy of species are the most striking features of homegardens, with all homegardens generally consisting of “a herbaceous layer near the ground, a tree layer at upper levels, and intermediate layers in between” (Nair 1993: 91). Plant diversity seems to decrease with altitude, length of dry season, share of cash crops, population density, labour shortage within the household and distance to urban areas (Hoogerbrugge and Fresco 1993). Traditional Thai homegardens are reported to contain multiple and sometimes rare varieties of each planted species and represented “in-situ reservoirs for biodiversity at all levels: genetic, species, and ecological,” all of which helps to prevent pest and weed outbreaks (Gajaseneni and Gajaseneni 1999: 19). The high density of homegarden plants also provides habitat for wild animals such as insects, reptiles, birds and small mammals (Christanty 1980). Describing the diversity of Indonesian homegardens (here called “mixed gardens”) in the Nineteenth Century, Sollewijn Gelpke observed:

“He who enters a mixed garden . . . with a botanical eye, sees before him a diversity of plants of which the uninitiated can form no idea. From the greatest inhabited heights to the shores of the sea, on clay and sand, in marshes and on dry land, the whole wealth of the tropics is laid open. That wealth of vegetation is all the more striking when the observer regards it from an economic point of view. He sees palms, bamboos, bananas and a number of fruit trees, all seemingly much alike and with various winding plants clinging to them.” (J.H.F. Sollewijn Gelpke 1901, quoted in G.J.A. Terra 1954: 33).

Nutrient recycling is the principal determinant for ecological rationality of homegardens (Gajaseneni and Gajaseneni 1999). A detailed study of four traditional Thai homegardens found that the households refrained from harvesting everything that could be harvested, and that this ensured minimal nutrient export from the system. In addition, the Thai homegardens contained more plant litter than a typical tropical forest, which should contribute to a highly efficient nutrient recycling (Gajaseneni and Gajaseneni 1999).

“[A] village with its home gardens is not merely a dwelling-place but also an important agro-ecosystem. It is an integrated unit in which the solar energy is channeled through the plants to animals and man, and matter is cycled and recycled. This cycling and recycling process, together with the layered plant cover, protects the soil of the home garden from exhaustion, leaching, and soil erosion.” (Soemarwoto 1985: 2).

Not much is known regarding how homegardens cycle nutrients and conventional analytical and research procedures cannot adequately describe the functioning of homegardens; this leads many researchers to conclude that homegarden systems are unsustainable despite that fact that such systems appear to have persisted for long periods without apparent symptoms of soil nutrient depletion (Nair 2001). More needs to be known regarding the contribution that homegardens make to improved management of natural resources.

Homegardens may be considered to improve or exacerbate public sanitation, depending upon the care with which household wastes are handled. In West Java, it is common for homegardens to contain fishponds. Fish are fed kitchen waste and the pond is fertilized by animal and human waste, including waste from toilets built above the fishpond (Soemarwoto 1985). These households do not use the fishpond water for any household needs. Livestock waste is also used to manure the garden and other fields. Urban homegardens may improve public sanitation at virtually no cost to the larger community by using organic wastes from slaughterhouse manure, treated sewage sludge and wastes from fisheries and breweries (Vasey 1990). However, mishandling of wastes, particularly human feces, may compromise sanitation (Vasey 1990, Soemarwoto 1987). The potential public sanitation benefits should be considered in any assessment of the benefits and costs of expanding the public water delivery system to accommodate homegardening.

Another potential impact of homegardening is land conservation. Terraced homegardens have been recommended to preserve soils on sloping areas (Terra 1954). Fruit trees, bamboo and other trees can be used to rejuvenate infertile soils. Tree roots that penetrate as far as 10 meters can bring mineral constituents into the topsoil, while fallen leaves can provide a natural protective mulching cover and bring more humus into the soil, helping to prevent exhaustion of soils (Terra 1954). However, it is important for homegardening families not to remove ground litter or engage in excessive weeding of the homegarden, which can increase the risk of soil erosion (Soemarwoto 1987).

Distribution of homegarden plots may also have beneficial off-site environmental effects. For example, where population pressures and lack of arable land threaten to push families to resettle in forests and wetlands, distribution of homegarden plots to landless and land poor families can reduce pressures to migrate. This not helps to reduce conversion of lands better left as forests and wetland, but also allows families to remain in areas with established social services and markets for surpluses produced on the homegarden. In addition, distribution of homegardens may reduce the need for land-poor families to gather fodder and fuelwood from marginal lands, contributing to the sustainability of such lands. See Mitchell (forthcoming).

3. FACTORS RELATED TO DEVELOPING PRODUCTIVE HOMEGARDENS FOR THE POOR

A number of factors combine to determine whether homegardens are an appropriate strategy for improving the livelihood of poor families. Among these, access to suitable land – i.e. a land plot that is large enough and sufficiently fertile for a family to establish a homegarden, and to which the family has ownership or ownership-like rights – is perhaps the most fundamental factor. The importance of access to land is occasionally mentioned in the homegarden literature, but does not appear to have been addressed in any detail. Where access to suitable land is not a constraint to establishing homegardens (or once planners have arranged to overcome the issue by providing secure access to land), other important factors become relevant, including access to water, access to know-how, and access to stocks of appropriate plants and animals. Cultural acceptance of homegardening and access to sufficient capital and labour are equally important. This section reviews these factors.

3.1 Lack of land

We are interested in how homegardens can benefit the poorest of the poor, which usually includes families without adequate access to land. A number of commentators have noted that lack of access to land is a serious constraint to homegardening (Hoogerbrugge and Fresco 1993, Marsh 1998, Vasey 1985). Across cultures, ownership of land appears to be a significant inducement to gardening and landlessness, and tenant status have been identified as constraints that effectively eliminate homegardening as a viable development strategy (Brownrigg 1985). Indeed, for families without adequate and secure access to land, lack of land is the single most important barrier to homegardening.

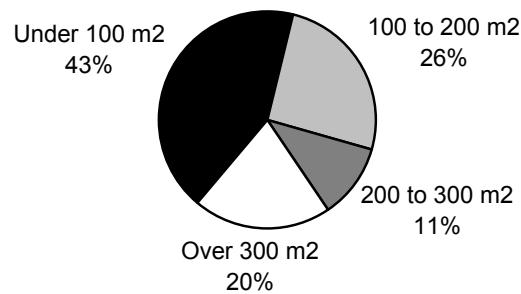
“Arrangement of adequate access to land and security of tenure should be a primary consideration in the design of projects which promote home or community gardens, as is true for other kinds of agricultural production development.” (Brownrigg 1985: 111).

The poor sometimes have adequate access to land, as for example in Russia and most other countries that emerged from the Soviet Union. In these countries access to land for homegardening has generally not been an issue, and all village families have access to plots used for homegardening. Such land is usually located immediately adjacent to the village house, and vegetable plots arranged on arable fields near the village. During the harvest season, owners take turn guarding the vegetable plots against theft.

However, inadequate access to land remains a significant problem for poor families worldwide, even in areas that commentators commonly associate with homegardens, such as Java. On crowded Java, the great majority of homegarden plots (known locally as “pekarangan”) are smaller than 200 m² (Prosterman and Mitchell 2002).¹³

¹³ In a study of a lowland rural village in Central Java, Rajagukguk (1989) found that of 1002 village families, 44 families (4 percent) owned no pekarangan or household plot, 347 families (35 percent) owned 50 m² or less, 328 families (33 percent) owned 50 - 100 m², 259 owned (26 percent) 100 - 500

Fig. 1. Size of household pekarangan plots on Java.



Source: Computed using 1995 Housing and Settlement Statistics (Indonesia Statistic Center Bureau 1996), cited in Arifin (2002), App. 2.

Even where a family has nominal access to land, the insecurity of their rights to such land may dissuade the family from making any long-term investments in improving the land, such as by planting trees, improving drainage, installing fencing or building a fishpond. Squatters and families who occupy land merely with the permission of a landlord (often the head of household's employer) may even worry that their improvement of the land they occupy may lead to eviction as others seek to cash in on the investment. Thus, it is not only the quality and sufficiency of the land itself, but the quality of the family's right to control the land which are critical.

If lack of access to land is a constraint in establishing a homegarden, how much land do families need to establish a homegarden? The size of homegardens varies considerably across cultures, and even within the same community. For example, Hoogerbrugge and Fresco (1993) survey a number of studies that report variations in size from 10 to 120 m² in one Zambian study to between 5000 and 20,000 m² in another Zambian study and variations of 172 to 500 m² in one Java study to between 200 and 1700 m² in another Java study. In Papua New Guinea, houseplots of 300 – 400 m² are often too small to meet the ambitions of household gardeners, who extend their gardens beyond the allotment or establish second gardens away from the house (Vasey 1985).

While the average size of existing homegarden plots is instructive regarding social and economic norms in a given community, there is evidence that distribution of even relatively small amounts of land to land-poor families can provide a base for important improvements to the household nutrition. In a study of Kerala wage-earning families who cultivate homegarden plots occupying a fraction of an acre, Kumar (1978) found that the value of homegarden production was the most consistent positive predictor of child nutrition, and was an especially strong predictor during the

m² and only 24 families (2 percent) owned more than 500 m². The size of rural pekarangan plots is declining over time, which Arifin (2002) attributes in part to the widespread practice of parents allowing their children to build houses on the pekarangan plots, which are then divided among the children upon the death of the parents.

slack employment season, as well as in households in which the mother is not employed outside the home.¹⁴ Kumar goes on to report:

Results of the study indicate that the proceeds of the produce from even small family plots of land, if intensively cultivated, lead to large increments in child nutrition. This is especially true when maternal labour force participation is absent. Additionally, during slack employment seasons, availability of garden produce, or income thereof, seems to provide a buffer against reductions in child nutrition during this period. Even though the exact mechanisms by which this occurs are not clear, the conclusion is that provided intensive cultivation of distributed land is possible, even small family plots can have an important nutritional impact for young children. (Kumar 1978: 60 – 61).¹⁵

The larger role of women in Kerala homegarden production, as well as the fact that women can more easily and better care for children at home, may contribute to the fact that better child nutrition is strongly associated with more productive homegardening (Kumar 1978). Given the strong correlation between homegardening and the presence of mothers not engaged in wage labour, distribution of land to landless and land-poor families may be a particularly fruitful strategy where employment opportunities for women are limited for societal or economic reasons (Kumar 1978).

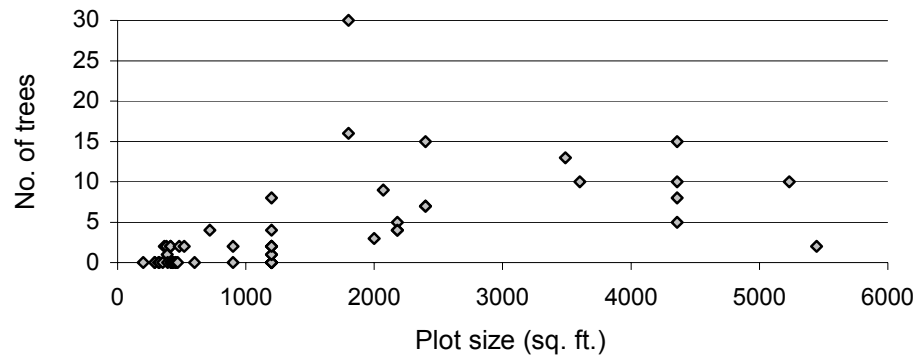
In a study of 62 rural homegardening households in Karnataka, India, researchers found that intensity of tree growing increased markedly once homegarden plot size reached 1800 sq. ft. (See Fig. 2). Of 14 households that grew 5 or more trees, only one had a homegarden plot smaller than 1800 sq. ft., while of the 16 households with plots 1800 sq. ft. or larger, 13 households (72 percent) grew 5 or more trees. This suggests that there is likely to be a critical minimum plot size above which households will begin planting more trees. The footprint of the house itself, which commonly occupies 500 sq. ft. or more of the land plot, is presumed to reduce greatly the number of trees that can be planted on the smallest parcels.

In a separate study, researchers identified Karnataka households that appeared to be making very intensive use of land. The researchers found that, after taking into account the size of the parcels, families who receive land from the government appear to be as likely to plant trees or raise animals as are families who inherit or purchase the homegarden plot. None of the interviewed families had received government extension advice or assistance with planting trees or raising livestock (Hanstad et al, forthcoming). This data suggests that at least for some poor families in Karnataka, access to land is a primary barrier to tree-planting and animal-raising.

¹⁴ Presumably, mothers who do not work outside the home – whether by choice or because such wage labour is not available – have more time to devote to managing homegarden production.

¹⁵ Urban homegardening was found to improve the diet of urban Filipino families by increasing the varieties of fruits and vegetables consumed (Miura 2003).

Fig. 2. Trees planted by Karnataka homegardening households.



Source: Hanstad and Lokesh 2003 (unpublished data).

In a sample survey of 97 land poor households that had received houseplots under government housing schemes in West Bengal, researchers found that the productive value of plots increased significantly with plot size until plot size reached approximately 3000 sq. ft. (270 m²) (Hanstad and Lokesh 2002). More detailed interviews of 45 similarly situated West Bengal households revealed similar results. In the smaller sample, homegardens smaller than 1000 sq. ft. (90 m²) were found to provide the fewest benefits. Productive value and reported benefits increased significantly for homegardens of 1000 – 1999 sq. ft. (90 - 180 m²), and increased further for homegardens of 2000 – 2999 sq. ft. (180 - 270 m²), but then plateaued or even decreased for plots larger than 3000 sq. ft. (270 m²) (Hanstad and Lokesh 2002).

In Papua New Guinea, one study suggests that an area of only 150 m² is sufficient to supply adequate fresh vegetables for a family of four, although another researcher argues that it would require 3,100 m² (Thaman 1990). In a study of Philippine urban homegardens, Miura (2003) found that size of homegarden plot did not affect the number of varieties of fruits and vegetables grown in the garden. Out of 103 households, 54 (52 percent) with plots larger than 100 m² had planted more than five varieties of fruits and vegetables, while 26 of 49 households (53 percent) with plots smaller than 100 m² had planted more than five varieties. Of course, the quantity of production of the larger and smaller plots is likely to differ.

Another important consideration is the cost of distributing small plots of land to land poor households. Assuming the government acquires land at market prices, can governments afford to distribute small parcels? Again, affordability cannot be considered in the abstract, but must be evaluated by looking at the cost and effectiveness of other programmes designed to address the needs of land poor families.

Hoogerbrugge and Fresco (1993) suggest that homegardens generally occupy “marginal” plots; that is, plots that are too small to be used for field cropping or grazing, or are on land that is too steeply sloped to be used for field cropping. Of course, to the extent that this is so, it is likely a consequence of locating rural housing, and the housing of the urban poor, on hillsides and other lands that are less suitable

for field crops and urban development. To the extent that homegardens are cultivated by poor households, it is natural to suppose that the gardens and housing will be located on economically marginal land.

Another consideration is whether land is available near the families who need the land. Vasey (1985) describes experience in Papua New Guinea in which a government programme to allocate gardening land away from the house failed since it was too difficult for the cultivators to guard against theft and vandalism. In Indonesia, government planners express concern that in some cases, land located near rural villages on Java is prime rice paddy land, the terracing of which has been undertaken at great social cost. Strict policies are in place to prevent conversion of such land to other uses, though the conversion of rice paddy land to residential land continues to occur.

At least one state in India (Karnataka) is initiating a programme that will establish several-acre colonies of house-and-garden plots with 10 plots per acre, and allocate the plots to landless and land-poor families. The land will be located within one kilometer or less of the village in which the recipients currently reside, and such land will either be existing government land or land that the government purchases.

3.2 Lack of water

Although homegardens are primarily rainfed, it is common for homegardeners to irrigate during the dry season. Watering depends on the type of crop and can vary from twice daily to twice annually (Hoogerbrugge and Fresco 1993). Several studies have found that drawing, transporting and hand irrigating the homegarden are the most onerous and time consuming gardening tasks. For example, Russian women expend considerable effort and time carrying water to irrigate home production gardens (tho Seeth et al 1998), although Russian gardens are much larger on average than tropical home gardens and are thus likely to require much more water. Homegardens that require even a few gallons of water per day during the dry season may require too much labour to be worthwhile (Brownrigg 1985).

In some areas, lack of water may be the major factor limiting homegardening (assuming the household has access to land). In Papua New Guinea, potable, piped water for irrigation is the most expensive input for urban homegardeners, and water is especially expensive during the dry season (Vasey 1985). In the United States, subsidies for water delivered to agriculture, including homegardening, is the most important government subsidy that agriculture receives (Brownrigg 1985, citing Cleveland 1982). Ninez (1985) reports that in Lima, Peru, urban homegardeners used waste water from the kitchen to irrigate their garden, but sometimes found they had to purchase small amounts of additional water. In 1983 the cost of water to irrigate a garden of 200 m² was approximately US\$3.50 per month, but in the poorer neighborhoods water was sometimes not available during the warmer months, and gardens suffered greatly.

It can be prohibitively expensive for the household to install a system for bringing water to the house, and there is a large social cost for providing irrigation water to households, especially in urban areas. Homegarden irrigation is rarely a consideration in the design of a reticulated water system, and it may be too expensive to make

capital improvements to an existing system necessary to accommodate demand for irrigation water (Vasey 1990). For urban homegardens in Papua New Guinea, use of unmetered water for irrigation during the dry season exceeded the value of the crops produced, while metered households found it uneconomic to use water for irrigation (Vasey 1990).

However, even if water costs exceed the value of production, low cost irrigation water might be justified as an appropriate subsidy for poor neighborhoods since it contributes to social safety net while reducing moral risks associated with government handouts. The cost-benefit analysis of subsidizing irrigation water for homegardens should not consider purely the economic value of homegarden production, but should take into account the broader social benefits of helping poor families to gain a degree of economic independence and the accompanying enhancement of self image and social status. Development projects that bring potable water to the village could free up labour spent hauling water, allowing the household to devote saved labour to homegardening (Brownrigg 1985).

Households may address the need for irrigation water using various strategies. In drought prone areas of the African Sahel, simple wells and artisanal irrigation are used. In West Bengal, rural communities are sometimes sited near a rainfed natural or artificial community pond that families can draw from for irrigation and other household water needs. Rainwater harvesting may be an affordable means of capturing, storing and applying water for homegardens (Agarwal and Narain 1999). International Development Enterprises - India (2004) has developed and successfully marketed several low-technology, low-cost micro-irrigation systems in India that are appropriate for homegardens ranging in size from 20 to 1000 m² and cost from US\$5 to US\$90. Households may also use household wastewater (Marsh 1998).

Water conservation strategies can reduce homegarden demand for water. Such strategies include terracing, trenching, deep mulch and surface mulch (including living mulch and ground cover creepers). Plant spacing and mulch may be used to conserve moisture (Vasey 1985), and drought-tolerant plants can reduce the impact of water shortfalls (Marsh 1998).

In areas of high rainfall, canopy layers, raised beds and drainage canals may help to prevent flooding (Brownrigg 1985), while use of water-loving plants and plastic coverings can help to reduce the effects of water abundance (Marsh 1998).

3.3 Lack of capital

Most homegardeners are unwilling or unable to invest much capital in their homegardens (Vasey 1985, Mendez 2001). Where households have access to capital, it is not surprising to find that homegardens are more productive. For example, one reason that homegardens cultivated by rural households in Russia are more productive than those cultivated by urban households is that the rural households have easier access to inputs and implements that originated from the former collective farms, some of which they may receive as a part of their wage for work on agricultural enterprises that replaced the collective farms, and some of which they may “divert” from such enterprises (tho Seeth et al 1998).

Homegardening materials need not be prohibitively expensive. In India, a “kitchen garden kit” developed for a pilot activity containing seven varieties of tree seedlings, high-quality vegetable seeds and five hybrid chicks currently costs 600 Rupees, or about US\$12 at current exchange rates.

An important limiting factor discussed in relation to capital is the use of inputs to improve soil fertility. Lack of capital is likely to be more of a barrier to homegardening where soils do not contain sufficient nutrients to support gardening and where households are not familiar with composting and other methods for improving soil fertility. In such cases extension advice should include instruction on accelerated composting and the possibility of gardening in containers while establishing better soils (Brownrigg 1985).

In addition to composting, households may construct terraces and plant leguminous trees to improve soil fertility (Marsh 1998). These methods may be labour intensive, but do not require large amounts of capital. Where gardening tools and other inputs are absolutely necessary, the government may find it useful to establish small local stores to sell simple tools and supplies at affordable prices.

Where fencing is required to reduce foraging by animals or theft of homegarden production, live fencing can be used to reduce costs. Plants used in fencing can also provide additional products for household use or sale (Marsh 1998).

3.4 Cultural barriers

Distribution of land for homegardens is most likely to lead to successful establishment of homegardens if homegardening is already successfully practiced in the vicinity where the new homegardens are to be established. The presence of viable homegardens in the immediate vicinity is the best predictor of success since such homegardens demonstrate that homegardening is socially and culturally acceptable, and is valued by households (Marsh 1998). Although projects to promote gardening often prefer to work with communal organizations, household-level food production must be a family undertaking since labour, space and time are valuable resources to poor households and “cannot be risked on the uncertain participation of a number of individuals,” even on a small scale (Ninez 1985).

Cultural preferences may inhibit households from taking up homegardening. Households may associate homegardening with poverty and therefore decline to establish gardens (Miura 2003). In Nepal, dark green leafy vegetables are often considered low-status foods, which might help to explain why Shankar (1978) found that consumption of vitamin A-rich foods did not increase along with homegarden size in the studied groups. In Bangladesh, dark green leafy vegetables are widely believed to be bad for young children, and this belief does not depend upon the household’s income or access to land (Cohen 1985).

Noting that the smaller size of homegardens in some western and eastern areas of Java, as compared to larger homegardens in the central part of the island, cannot be explained ecologically, Terra (1954) concluded that the differences must therefore have an ethnographic explanation. He opined that the difference has to do with the tendency of lands in matriarchal societies of the region to evolve into family-owned

plots, while lands in patriarchal societies of the region tend to remain controlled by the head of the dominant clan (Terra 1954).

Lifestyle preferences can limit the ways in which households use their house plot. For example, although it is common to combine gardening and small livestock production in Indonesia and other South East Asian cultures, small livestock are said to be the main ravagers of gardens in other areas (Brownrigg 1985). Households may thus feel compelled to choose between gardening or raising small livestock. Where local culture places a high value on free access to house sites by neighbors, households may be unwilling to construct fences necessary to keep out animals (or keep in animals) (Brownrigg 1985).

Cultural values may evolve over time to cause changes in the way homegardens function. Soemarwoto (1985) reports a trend of moving the household toilet from above the fishpond to inside the house in order to improve aesthetics and comply with ideas of modernization, even though this means that human waste is no longer be recycled in the fishpond where it had been converted into protein, but is instead be flushed into streams where it will contribute to harmful algae blooms.

3.5 Lack of information on nutritional benefits of homegardening

Public information campaigns can play an important role in encouraging families to plant and consume more vegetables. Many families are not aware that vegetables and fruits are nutritional. In a study of Philippine urban homegardens Miura (2003) found that mothers generally had no knowledge of vitamins and iron in foods until informed by community health workers. Before they learned about the nutritional value of vegetables, some Filipino families mistakenly believed that micronutrient tablets distributed by the government were more desirable than consumption of vegetables, and that vegetables were the poor man's substitute for tablets. Brun (1989) recounts the case of a village studied in west Senegal, where mothers cultivating homegardens did not seem to understand that vegetables were good for their children and most mothers stopped growing carrots when their children snuck through homegarden fences to eat them raw.

Miura (2003) found that urban Filipino families who obtained health information from NGO-funded local health improvement programmes and community health workers had planted more fruits and vegetables, including dark green leafy vegetables, than families who had not received such information, regardless of socio-economic status, size of the homegarden plot and general knowledge of nutrition. Miura concluded that the fact that socio-economic status did not affect the degree to which families adopted advice received from NGO-funded local health improvement programmes and community health workers indicates that home gardening is a suitable strategy for poor communities. Even where families are already consuming vegetables and animal proteins, educational campaigns can help to increase their consumption by mothers and children. One such campaign in Central Java, conducted through radio, banners, billboards, posters and face-to-face communication, resulted in an increase in consumption of eggs and vegetables by mothers and young children across all socio-economic groups, leading to an improvement in serum retinal levels (de Pee et al 1998).

3.6 Lack of agricultural extension advice

It is common to find that government agricultural extension programmes ignore homegardens in favor of working with commercial field crop producers. This should not be surprising given that most agriculture ministries are focused on production of staple foodstuffs and export commodities rather than subsistence agriculture. On the other hand, it is rather strange that governments that spend large sums on “household food security” programmes – in India these take the form of redistributing food resources through public distribution systems, fair price shops, food for work programmes, etc. – should so neglect improvement of homegardening plots that would not only add additional food to the system, but would deliver that food to households that most need it.

Agricultural extension can contribute significantly to homegarden production. At the beginning of the Helen Keller International pilot homegardening project in Bangladesh, 50 percent of households reported having a garden with mean size of 61 m² and growing an average of 3.1 varieties of vegetables, whereas after two years with the project 100 percent of households reported having a garden with mean size of 138 m² and growing an average of 17 varieties (Marsh 1998). This demonstrates that families can learn to cultivate homegardens more intensively.

The background of extension agents can play an important role. Brownrigg (1985) recounts the experience of a project in Ghana in which senior extension agents were young women with graduate degrees in agriculture and training in nutrition, while junior agents were local young women and men from the target communities. She reports that the local extension agents were accepted much more easily than either foreigners or non-local national staff.

One common approach to providing extension advice for homegardening is for a project to establish a “demonstration garden.” Brownrigg believes this can be a poor strategy, especially if the gardener in charge is either from the village elite (which causes people to view homegardening as an elite activity) or is a hired labourer from the lower rungs of the village social ladder (which causes people to view homegardening as a low status activity).¹⁶ If a demonstration garden is used, implementers may want to convince at least one of the better local home gardeners to work with the project to improve an established homegarden (Brownrigg 1985).

Gardening promotion projects are likely to be most successful where homegardens already exist. Homegardens must be introduced gradually in areas where they do not exist; an overnight “revolutionary” approach has proved problematic in many homegarden campaigns (Ninez 1985).

3.7 Lack of appropriate plants and livestock

Interventions that seek to advise families on appropriate techniques for improving homegarden production may find that homegardening families do not have adequate access to seedlings and other necessary materials. This is more than a question of

¹⁶ Brownrigg also notes that school teachers are a particularly poor choice as local homegarden extension agents since they either have no experience in gardening or tend to approach the garden as an academic exercise rather than focusing on actually producing plants and animals.

access to information or even access to capital. The materials necessary for homegardening may not be locally available.

The introduction of improved inputs can make a significant contribution to homegardening productivity. A useful example is a project undertaken by Heller Keller International to improve animal husbandry in rural Nepal, Cambodia (poultry and eggs) and Bangladesh (poultry, eggs and fish). The projects targeted household egg production by introducing improved breeds of birds that produce more eggs, along with vaccinations and assistance with proper housing and feed, targeted livestock production by promoting improved grass fodder and deworming tablets for milk cows, and targeted fish household fish production by introducing fast growing fish cultivars and plant sources of fish feed. In all three countries, ten to twelve months after the improved breeds were introduced, households in which chicken liver had been consumed within the past 7 days rose from 21 percent of households to 35 percent of households. In addition, the number of eggs consumed in the household rose from a weekly average of 5 eggs to a weekly average of 12 eggs, while the number of eggs consumed by all household children rose from a weekly average of 2 eggs to a weekly average of 3 eggs (HKI/AP 2003).

It is important for planners to avoid the unsustainable practice of importing planting materials and breeding stock and instead establish “sustainable local mechanisms for the procurement, production, and distribution of seeds and other planting materials” (Brownrigg 1985: 104). Dozens of successful gardening projects have independently concluded that the solution lies in establishing nurseries, seed multiplication units and seed beds under local control (Brownrigg 1985). Perhaps the largest homegardening improvement project ever undertaken is the NGO Gardening and Nutrition Education Surveillance Project, in which Helen Keller International works with local NGO’s to establish village nurseries to provide seedlings and seeds to rural homegardeners in Bangladesh. The programme was scaled up over ten years and was reaching 800,000 households as of 2001 (HKI/AP 2001).

Before a homegardening project identifies which plants and livestock to promote, planners should study the preferences and capacities of local homegardening families. The choice of appropriate plants and livestock must depend upon what local people prefer to eat, as well as what plants and livestock are well suited to the local environment and resource profile of households (land, labour, capital), especially during the “hungry season” when stores of foods are scarce (Brownrigg 1985).

3.8 Lack of available labour

Homegardens typically are cultivated using “marginal” labour, which is marginal in the sense that it is flexible and its use reflects low opportunities for alternative employment (Hoogerbrugge and Fresco 1993). Although there is not much data on volume and timing of labour inputs (Hoogerbrugge and Fresco 1993), commentators tend to agree that most traditional gardening practices involve only a few days of preparation and less than an hour per day for maintenance and harvesting. During the five-month growing season, it was estimated that homegardens in urban Lima required an average of 50 minutes per day to prepare soil, plant, cultivate, water and harvest (Ninez 1985).

Poorer families may garden more than better off families. In the urban capital district of Papua New Guinea, squatter settlements and government housing estates, which have a high proportion of unemployed and underemployed workers, contain homegardens averaging 469 – 523 m², which is 29 – 35 percent larger than the average for the district as a whole (Vasey 1985).

However, even poor families may rationally decide that the opportunity cost of homegardening is too steep. For example, it is reported that many poor families in Java must engage all household members in wage labour and therefore have no time to spare for gardening, even though the family is aware that they could obtain additional income or nutritious food from the homegarden (Soemarwoto 1987).

In this respect it is important for planners to appreciate that the opportunity cost of spending time on gardening is not zero, and labour intensive technologies may not be appropriate in many contexts since household members do not have unlimited time available for gardening (Brownrigg 1985). Homegardens are more sustainable if labour requirements are low and somewhat flexible (Marsh 1998). Planners contemplating homegardening projects should consider the availability of marginal labour among households targeted for assistance.

4. POLICY AND PROGRAMME CONSIDERATIONS

In determining whether to adopt homegardening as a strategy for improving the livelihood of poor families, planners must begin by defining the class of prospective beneficiaries.¹⁷ Although homegardening may be a beneficial intervention for both urban and rural poor populations, the opportunities are likely to differ based on a number of considerations. Suitable land is much more likely to be available in sufficient quantity and quality in rural areas, either because poor families already possess suitable land or because planners can obtain suitable land and distribute it to target families. Once the general class of beneficiaries is defined, we propose that planners undertake the following analysis, summarized in Figure 3.

4.1 Preliminary assessment of general suitability of homegardens

After planners define the general class of beneficiaries, a threshold question is whether homegardens are likely to provide benefits to the target population. To answer this question, planners should ask whether homegardens presently provide benefits to any families (including the non-poor) in the vicinity of the area where the target population resides (the target area). Areas in which households have historically been unable to overcome climatic, economic or cultural constraints to operating homegardens may not be appropriate areas for homegardening interventions (Marsh 1998, Ninez 1985).

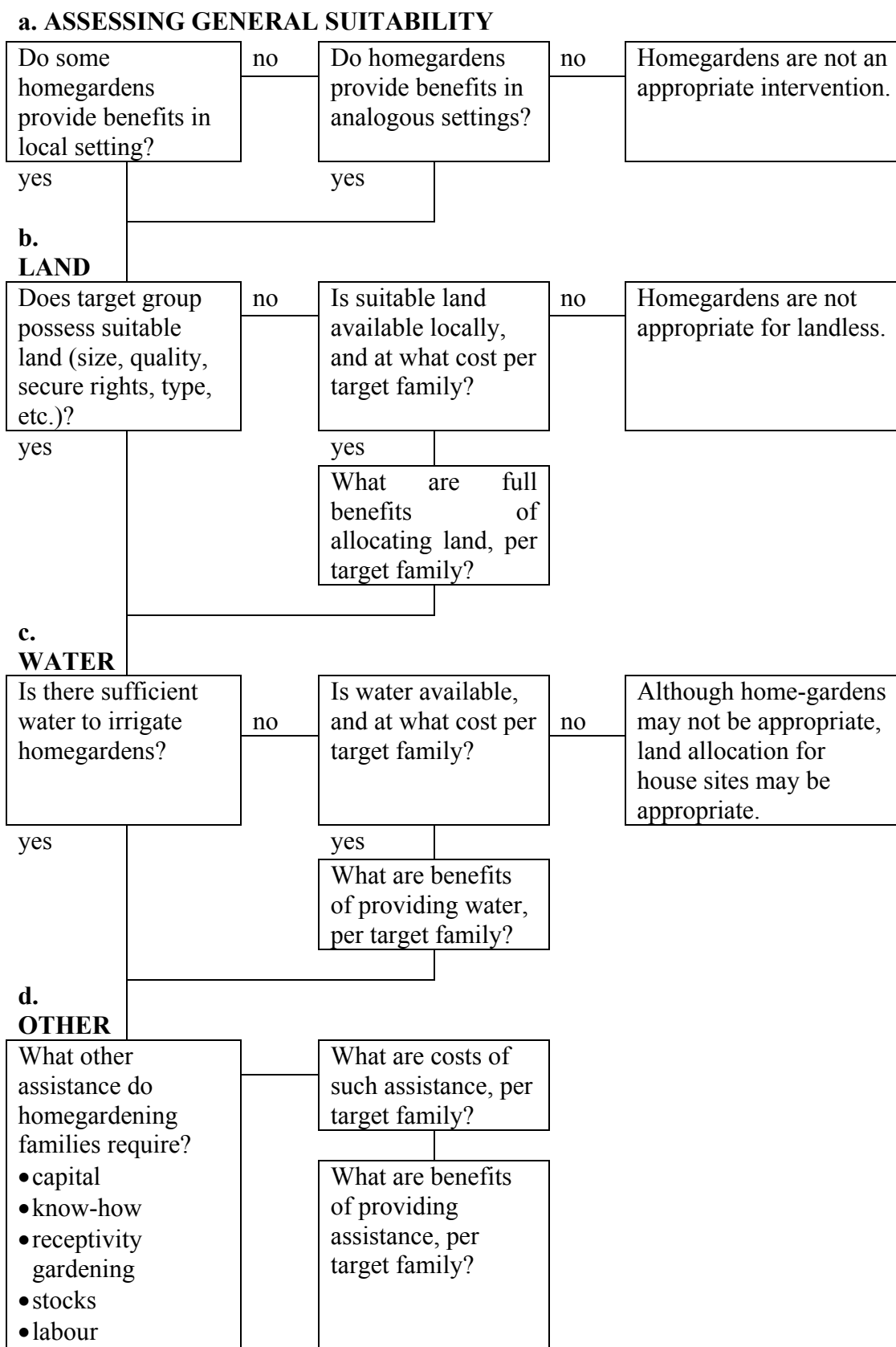
If homegardens do not appear to exist or do not appear to be providing substantial benefits to any families in vicinity of the target area, the question then becomes whether homegardens are providing benefits in settings that planners deem to be analogous to the target setting, including settings in other communities with similar climates and similar resource constraints. The existence of homegardens in the vicinity of the target-setting (or in analogous settings) would suggest that water, soils, climate, cultural preferences and other factors are not a barrier to establishment of productive homegardens in the target area, and further suggests that homegardens may be a viable strategy for addressing livelihood needs of the target population.

In making the preliminary assessment on whether homegardens might provide benefits to the target population, planners will likely benefit from field inquiries or studies, using rapid or participatory appraisal methods. Such field inquiries or studies might apply one or more of three approaches:

- (1) *What are existing typical uses and benefits of homegardens by target population?* Focus should be on a representative sample of the target population to determine how home plot is used, what benefits accrue, and what constraints are faced.

¹⁷ Definition of the general class of beneficiaries is presumed to depend upon the base poverty line, family ownership of various assets, and other measurements already familiar to planners.

Figure 4. Analyzing appropriateness of homegardens



(2) *What potential uses and benefits do homegardens offer target population?* Focus should be on a purposively selected sample of the target population that have well-developed homegardens. Investigators should determine the benefits and how and why this portion of the target population has been able to use homegardens more productively.

(3) *What best practices have emerged from NGO or other interventions related to homegardens in the target area?* It is possible or even likely that NGO or other government departments have made or are making small-scale homegarden interventions in part of the target area. These deserve study so lessons can be learned, successes replicated and mistakes avoided.

4.2 Access to land

Once planners make a preliminary determination that homegardens might provide benefits to the target population, planners should determine what proportion of families in that population have access to suitable land on which to construct a house and establish a homegarden. It is important to address the issue of access to land separately from access to other inputs for several reasons. Where families do not possess suitable land or their rights to possessed land are not sufficiently secure, this is the single largest barrier to establishing homegardens. While the cost of obtaining and allocating land to target families may be quite affordable, the nature of land – the fact that it is immovable, and the fact that access to land can have important social and political implications – makes its allocation more complicated than allocation of other homegardening inputs such as water, know-how, appropriate plant and animal stocks, etc. For these reasons, it is appropriate for planners to evaluate the costs of identifying, obtaining and allocating land independent of other costs.

At the same time, planners should attempt to assess the special benefits associated with allocating homegarden plots to landless and functionally landless beneficiaries. Provision of land to a landless or functionally landless family can have benefits far beyond the benefits ordinarily associated with homegardening, including improved status in the village and the ability to demand reasonable wages in the job market without risk of eviction. See Box 1. Thus, planners should assess the value of special benefits associated with allocating land to landless families separate from their evaluation of other homegardening benefits.

In determining what proportion of families in that population have access to suitable land on which to construct a house and establish a homegarden, planners should assess suitability of land in relation to two important factors. First, the parcel on which the family resides must be large enough to support a homegarden that can provide benefits to the family.¹⁸ Second, the family must have ownership-like rights to the land rather than use the land as a squatter or with the permission of a landlord.

¹⁸ If “family” is defined as a nuclear family (parents and unmarried children), then it quite common to find that married children occupy the homesite of their parents, such that several generations, comprised of several nuclear families, occupy the same homesite. In many such situations, the second generation is functionally landless since they own no land of their own and the homesite is not large enough to support the number of occupying nuclear families.

The existence of ownership-like rights determines whether the family has the right to improve the land and whether the family has a reasonable expectation of receiving the benefits of any long-term improvements, such as planting trees.

For that portion of the target group already possessing suitable land for homegardening, planners should proceed to consider the sufficiency of water and other inputs such as family capital, family know-how, etc., as described in following sections. For that portion of the target group that does not possess suitable land (as defined above), planners must undertake a critical analysis to determine the availability of appropriate land in the vicinity of the target families. Planners should consider the quantity of land available from various sources, including government land and land that the government might purchase from private owners.

In the case of assessing the availability of public lands for reallocation, planners should take special care to verify that the land is not functioning as a common property resource providing benefits essential to the local population. This is a significant risk in many settings where the government claims ownership of common property resources such as community forests or wastelands located near population centers. Planners frequently underestimate or are unaware of the extent to which poor families use such resources to graze livestock, hunt forest animals, and gather plants for consumption, fodder, medicine and fuel (Jodha 1990, Blair 1996, Meinzen-Dick et al 2001). Even where planners recognize that such activities occur, they may underestimate the importance of these activities in the household economy of the poorest families. It would be counterproductive to eliminate a common property resource that provides a low level of support to a large number of poor families in order to distribute homegarden plots to a smaller number of families, even if the total economic use of the land would be enhanced by such a use conversion. The detrimental impact on some poor families would not justify the benefit to other poor families. Planners should also satisfy themselves that available land is not located in a place where residential uses would create sanitation or other environmental problems.

If planners determine that appropriate land is available in the vicinity of the target population, they should then calculate the cost of purchasing such land (if it is necessary to purchase it), as well as administrative costs of obtaining and allocating the land, calculated in terms of costs per family benefited. (See Box 2.) Planners must also consider whether the beneficiaries should share in the costs of land purchase (as well as other costs), and, if so, to what extent. Important factors to consider include: affordability for what are likely to be among the society's poorest households, administrative costs of collection (relative to benefits of such collection), the desirability of cost-sharing by beneficiaries to promote their "ownership" of the programme activities, and related moral risk issues.

Because homegardens must be established near where target beneficiaries live and because appropriate land is likely to be more available for acquisition and allocation in rural areas, homegardening – and allocating land for homegardens – may be a particularly viable strategy in rural areas. Programmes that enhance the livelihoods of poor rural families may have the added advantage of reducing the incentives that members of poor families have to migrate to cities in search of better livelihoods.

Box 2. Cost of obtaining land: evidence from India.

The cost of obtaining suitable land on which to allocate homegarden plots is likely to be affordable, especially in rural areas. In Karnataka, India, a November 2001 sample of 400 rural households in four districts estimated the value of unimproved and non-irrigated agricultural land to be between 21,000 and 44,000 Rupees per acre, with an average of 33,250 Rupees per acre (Hanstad et al 2002), which equates to approximately US\$ 694 per acre (US\$ 1,714 per hectare) at November 2001 exchange rates. This represents an average cost of approximately \$86 per family benefited if each family receives 500 m² of land (20 families per hectare).¹⁹ These estimates reflect the likely purchase price of acquiring agricultural land at market prices, but do not include administrative costs of acquisition and allocation, or costs of constructing simple roads and drainage. Although such costs are likely to be low in comparison to land acquisition costs, they are not negligible.

Another consideration is whether creation of homegarden plots is likely to reduce the amount of arable land, causing a fall in overall agricultural productivity or exacerbating food security concerns. Even assuming that arable land is used to create homegardens, these risks are likely to be insubstantial for several reasons. First, because even very small plots can provide important benefits to families, the total amount of land needed for homegardens is likely to be modest. Assuming that 5 percent of the acquired land is used to construct roads, drainage and other infrastructure, a one hectare plot could provide 380 m² plots to 25 families. To place this in perspective, in India, distribution of 380 m² plots to each of the nation's estimated 15 million completely landless families would require only 600,000 hectares of land, which is approximately 4/10 of 1 percent of the nation's 161.8 million hectares of arable land (FAO 2002).

Second, if used with even modest intensity to produce vegetables, fruits and animal products, homegarden plots are likely to be produce as least as much agricultural value per unit area as had been produced on the arable land. A study of Javanese home gardens found that net income per square meter was higher for homegardens than for rice fields. The same study found that relative costs of production on home gardens were much lower than for rice fields (15.1 percent of gross income versus 55.9 percent of gross income for rice fields) (Danoesastro 1980, cited in Christanty 1990).²⁰ The latter is particularly important for poor households, who typically have less access to credit and are less able to insure against risk. A study of well-

¹⁹ In a December 2000 survey of 500 rural households in West Bengal, respondents estimated the average cost of non-irrigated arable land to be 46,975 Rupees per acre (Hanstad and Lokesh 2002), which is equivalent to approximately US\$ 1,006 per acre (\$US 2,487 per hectare) at December 2000 exchange rates. If one hectare is divided such that 20 families receive 500 m² of land each, this represents an average acquisition cost of approximately \$124 per family benefited.

²⁰ Marten (1990) reports that a study of households in West Java revealed that although rice fields controlled by the poorest households produced a higher value of products per square meter as compared to the value produced per square meter on the homegarden, the cost of purchased inputs for homegardening were much less; for the better-off households (defined as any household earning more than \$100 per year), the value of homegarden production per square meter equaled the value produced per square meter on rice fields.

developed homegardens in Karnataka indicate that the income per square meter is several multiples higher than arable land in the same area used for grain crops. (Hanstad et al, in preparation). On a macro-scale, homegardens in Russia comprised about 4.5 percent of total agricultural land in 2000, and yet were reported to have produced 64 percent of all produce in the country, including 90 percent of all potatoes and 75 percent of fresh vegetables (Borisova 2000.)

Third, even if homegardens do not produce as much per hectare as arable land, the effect of any reduction in the total amount of food produced is likely to be offset by the fact that homegardens efficiently provide foods to one of the most food-insecure segments of the population. Homegardens are likely to make such foods available to the poor more efficiently than other government food programmes since the poor themselves control distribution of homegarden products. Whatever production poor families do not consume they will trade or sell to others.

In evaluating social value of distributing homegarden plots, it is useful to evaluate the efficacy of alternative programmes targeted to assist the same populations. In India, for example, we have found that government resources devoted to constructing housing for landless and land poor families might be better spent, and would reach more beneficiaries, if some portion of programme resources were diverted from housing construction and instead used to obtain larger house sites that provide space for homegardening. Our own field research in India indicates that even the poorest rural households are able to accumulate the resources to construct a house (in stages) if they have secure rights to an adequate house site. For example in one study of 45 households who had received house sites from the government, 32 had constructed housing without government assistance, indicating that these families had the personal incentive, as well as access to sufficient materials or sufficient savings or access to credit to construct the house once they received land (Hanstad and Lokesh 2002).

Several other considerations may be considered in planning the acquisition and allocation of land for homegardens:

- Ownership of the land should be registered and certificated in the name of both spouses. This provides a level of additional protection to the wife in case of spousal separation or death of the husband. In addition to this important security protection, the literature indicates that legal land ownership by women facilitates increased respect within their families and communities, as well as a means of earning and controlling income, feeding their families and accessing government programmes (Agarwal 1994, Deere and Leon 2001, Deininger 2003).
- Although it is important to register ownership of the land and issue appropriate ownership documents, the lack of a full-fledged land registry for conducting land transactions should not impede allocation of land to landless and land poor families. Families who receive small parcels for construction of a house and establishment of a homegarden are unlikely to want to transfer such land in the near term, which reduces the importance of the transaction registry. However, such families must be able to prove their rights to the land to protect against uncompensated taking by the government.

- In order to reduce the threat that local elites, including large landowners, will seek to capture benefits of the land allocation programme, planners should keep the benefits relatively small for each beneficiary family. Most elites will not be interested in receiving small parcels measuring, for example, 380 m². In addition, if the parcels are sited in colonies, elites are likely to be even less interested in obtaining such land since its location within the colony reduces the alternative uses to which the elites could put the land.
- Before the land is allocated, planners must resolve any questions of prior ownership and address any land use restrictions to ensure that the land can be allocated for residential and homegardening uses. Where the land acquired is zoned as agricultural land, it may be necessary to redesignate the land for non-agricultural uses.
- Planners must consider typical habitation patterns and related customs when allocating land for homegardens. Sociological research may be required to inform the planning process. In deciding where to site new homegarden plots, planners should be sensitive to the issue of isolating groups according to caste and ethnicity. In deciding the shape of the allocated parcels, planners should determine how close to one another families in the region generally prefer to build their houses – longer parcels may allow for a more intimate siting of houses than square parcels. If beneficiary families are willing to relocate from their existing village, how close must the new colony of residential homegarden parcels be to that village? In India, for example, land poor families state that they would prefer to receive a new residential plot of land within one half to one kilometer of the existing village.

4.3 Access to water

Water deserves special consideration. In many environments, water for homegardening is likely to be the most important consideration after land. In some environments, water may be even more scarce than land and more expensive to supply during the driest months of the year. Where water is scarce throughout the year, its absence may preclude homegardening as a viable strategy.

On the other hand, the amount of water needed for homegardening is often not great, and carrying water to the garden may be a reasonable solution. In addition, water availability should be considered when identifying which trees and other plantings to promote in homegardening. Project planners may also be able to reduce water demand of homegardeners by providing extension advice on water conservation and subsidizing low-cost techniques homegardeners can use to collect, store and efficiently use rainwater and household wastewaters.

Even with conservation and such self-help approaches to irrigation, the increased need for irrigation water may stress public water delivery systems, particularly in urban areas and particularly during dry months. Clearly, if homegardening irrigation by some families causes other families to lose access to adequate amounts of water necessary for household needs, this will not be an acceptable trade off. If planners do

not plan for the increased demand for water that comes with homegardening, water shortages could result.

Planners may therefore wish to explore the cost of upgrading systems for delivering water to households, or establishing new delivery systems where homegarden plots are being allocated to landless families. Once planners determine that it is technically feasible to supply adequate amounts of water to the planned homegardens, they must calculate the costs per family benefited to determine whether the cost is socially justified. It is quite possible that the public cost of supplying irrigation water to homegardens will exceed the economic value of products produced in the homegardens. Under such conditions homegardening will prosper only if the public subsidizes the cost of delivering irrigation water to homegardens. Such a public subsidy may be socially justified when viewed against other public subsidies targeted at providing social assistance to the poor.

4.4 Access to other inputs

Once access to land and water are secured, planners must consider what other factors require attention to promote homegardening, and what issues are likely to arise with respect to each. Most literature dealing with homegardens applies to these questions.

Capital

As was noted at the beginning of this paper, one important and distinguishing characteristics of homegardening is that it is the poor may enter without making great investments of capital (Marsh 1998). Ultimately, homegardens are likely to be a useful strategy for improving the livelihoods of poor households only if such households value homegardens to the extent that they are willing to invest scarce savings in improving and maintaining the homegarden. To be sustainable, homegarden inputs must be affordable within the typical household budget of the poor. In India, we have met with very poor agricultural labourer families who invested scarce family capital to construct housing, plant trees and raise poultry and livestock once they obtained secure ownership of small plots of land. These families reported receiving no government assistance in purchasing inputs for homegardening.

As with many development interventions, programmes to distribute homegardens to the poor bring with them the risk that beneficiary families will not value what they are given for free. One solution is to design programmes such that recipients of homegarden plots are obligated to invest their own time and labour in making improvements to the plot, such as construction of a house. Families are likely to value such assets if they make active investments of this type.

In many situations planners may determine that some level of public subsidy of homegarden inputs is justified, at least with respect to homegarden start-up costs such as the purchase of seedlings and seeds. If the project subsidizes these or other homegardening inputs, it may be useful to use “introductory” schemes in which inputs are sold at a reduced price for a limited time, rather than outright gifts of inputs. This approach has been found to legitimize projects as something other than an attempt to “help the poor,” which poor families often resent (Ninez 1985). Planners should avoid any project design that calls for ongoing subsidy of inputs.

Know-how and receptivity to gardening

Although the poor may be able to find capital to purchase building materials, planting materials, poultry and livestock, in some cases it may be much more difficult for them to access reliable information on how to maximize the productivity of plants and animals. This is likely to be particularly true in urban areas where many families do not have direct experience in agriculture. Agricultural extension can help to fill information gaps.

It is important to integrate nutrition awareness and education into garden planning so that homegardening families have full information upon which to base decisions of whether and to what extent they will use the homegarden to produce foods to supplement and improve the family diet, as opposed to using the homegarden primarily as a source of additional household income. When designing an effective means for communicating an appropriate nutrition strategy, planners must understand the traditional diet and food taboos, seasonal food shortages, food storage practices, food cooking practices, and distribution of food within the household. It is most effective to integrate gardening technique education with nutrition education so that households can plant varieties that comply with taste preferences and that will supply nutrients year-round (Marsh 1998).

Even where homegardening families have experience in producing various plants and animals, they may not fully understand the long-term consequences of various production techniques. For example, homegardeners who do not take proper steps to preserve soil fertility may eventually find that the soil is exhausted. Extension agents can explain the benefits of using animal manures and composting of kitchen wastes can help restore nutrients to soils. The fact that homegardens have persisted for generations in some societies without the addition of artificial fertilizers suggests that viable low-cost strategies do exist for preserving soil fertility. Programmes promoting homegardening should include an agricultural extension component that helps families to appreciate the importance of soil fertility and affordable techniques that will preserve soil nutrients.

Agricultural extension and nutritional education can serve another important purpose: helping families to understand and value the economic practicalities of homegardening, as well as the ways in which homegardening can contribute to family food security, family nutrition, family income and family social status. Ideally, the local community will value homegardening as an appropriate strategy for all families rather than as a leisure activity of wealthier households, or a mark of household poverty. Although it may seem somewhat contradictory, homegardens may be a better strategy for improving the livelihoods of the poor if homegardens are presented as a universal strategy for improving household nutrition and household independence, rather than as a “poor man’s” strategy of subsistence. To the extent non-poor families participate in homegardening, this removes the social stigma of gardening as an activity of the poor, and improves the relative status of poor families by providing them with another activity they have in common with non-poor families. For these reasons, planners should consider whether agricultural extension should target not only poor households, but all homegardening households. Brownrigg (1985) suggests that it may be better to avoid creating demonstration homegarden plots, and focus instead on working with a local family who is willing, in the spirit of

experimentation and cooperation, to allow their homegarden to be used as a demonstration garden for the village.

Intervention projects should promote the economic benefits of homegardening rather than focus solely on benefits of home consumption. Increased income can also be used to purchase more nutritious foods. Other potential economic benefits include: (a) returns to land and labour are often higher for homegardens than for field agriculture, (b) homegardens can supply fodder for animals, fuelwood, supplies for handicrafts, (c) household processing of homegarden fruits and vegetables can increase their market value and preserve them for later consumption, and (d) sale of homegarden produce may be one of the only sources of independent income for women (Marsh 1998).

Stocks

Homegardening planners should avoid introducing plant species that are locally unknown, no matter how nutritious and economical the plants are. Where it is uncertain whether particular plants can be grown easily in the local environment, or it is uncertain that they are accepted in the local diet, there may be high hurdles to their adoption (Brownrigg 1985).

Homegardening projects are more likely to succeed by promoting existing local species and by making local planting stocks more readily available to the target population. The most sustainable approach is likely to be one in which local nurseries can be established to satisfy the needs of homegardeners while earning a profit for the nursery. Programmes to help establish local nurseries may help to demonstrate their profitability. In the Helen Keller International programme to promote homegarden development in Bangladesh, implementers found that the lack of a regular supply of quality seeds and other gardening inputs was a constraint to improving homegarden production. Their solution was to establish a series of privately owned village-level nurseries to provide information and plant stocks to homegardeners:

“Local partner NGO’s work with their community groups to establish village-level nurseries and homestead gardens. The village nurseries serve as a community support service network in such a way that they are the focal point for demonstration and training on low-cost, low-risk gardening practices for nursery holders, the leaders of the NGO women’s groups, and household gardeners. In addition, they are the source and distribution centres for seeds, seedlings, and saplings, the sites for demonstration of new plant varieties, and the centres for community mobilization and organization. The majority of the village nurseries are operated as small enterprises and are a significant source of income for the household.” (Talukder et al 2000:167)

5. CONCLUSION

Homegardens represent an especially useful strategy for promoting sustainable livelihood objectives of the poor, including secure access to land and water, improved financial security, improved leverage in wage bargaining, improved nutrition, improved social status and political status, and better access to basic infrastructure. Where poor families lack secure rights to homegarden plots of suitable size and quality, programmes to obtain and allocate land to such families will often be found to be a constructive and socially beneficial use of government resources. For such families, the benefits of obtaining ownership of land on which to construct a house and garden go well beyond other benefits normally associated with homegardening.

Where families already have secure rights to homegarden plots of suitable size and quality, governments should seriously consider investing in water infrastructure, agricultural extension and nutritional education, as well as programmes to ensure that appropriate stocks of plants and animals are available to homegardening families. Although some public funds will doubtless be necessary to establish or strengthen homegardening for landless, land poor and otherwise poor families, a successful homegardening intervention will be one in which the homegardens become a self-sustaining intervention, satisfying the particular livelihood objectives of the homegardening family, while reducing the family's continued dependence on public resources.

International donors should consider advancing the issue of homegardening, including the issue of allocating land to establish homegardens, in three principal ways: (1) through supporting research; (2) by promoting consensus building among donors, government planners and project implementers; and (3) by directly supporting government or NGO homegarden intervention projects. Each approach may be undertaken simultaneously in any given development setting. Research and intervention projects can both drive the consensus building process and can benefit from the consensus reached at any given stage.

The process of developing and implementing a homegarden strategy will itself require cultivation and some degree of risk taking. One way to focus the sequencing of decisions is suggested above in Figure 3, which includes a strong focus on ensuring access and secure rights to land that will be used for homegardening and house construction. Donors, government planners and project implementers can gain a head start in planning by conducting rapid rural appraisal to assess the opportunities of establishing and promoting homegardens in a particular setting. Donors in particular should look for ways to encourage government planners to be assessing such opportunities, including by learning from NGO's that have practical experience in implementing homegardening projects.

Research should generally focus on documenting and studying the costs and benefits of existing homegardening intervention projects to determine what types of models hold the most promise. A special subject of research is the ongoing assessment of homegardening intervention project impacts, particularly from a sustainable livelihoods perspective. Successful projects and resulting best practices should be reported widely in the donor community. Research may also focus on identifying

which naturally occurring plant species in the target environment are most likely to do well in local homegardens, both from the standpoint of horticulture and the standpoint of local preferences, diets and markets. At the international level, donors might support research that attempts to establish uniform standards and benchmarks for measuring and analyzing the costs and benefits of homegardening interventions.

Donors may encourage consensus building among donors, government planners and implementing organizations (principally local non-governmental organizations) through sponsoring local workshops that bring together the relevant parties to share experiences. International non-governmental organizations that have practical experience in homegardening may also make important contributions to the planning and implementation process.

But research of existing homegardens and encouraging consensus building should not be substitutes for acting to establish new homegardens and improve existing homegardens. Once donors, government planners or NGO's conclude that homegardens are likely to provide an acceptable threshold of benefits to target beneficiaries, they should fund, implement and monitor homegarden intervention projects. In this way, the potential of homegardens can be explored in the process of providing current benefits to those most in need.

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Further information about the LSP

The Livelihood Support Programme (LSP) works through the following sub-programmes:

Improving people's access to natural resources

Access of the poor to natural assets is essential for sustainable poverty reduction. The livelihoods of rural people with limited or no access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating assets, and recuperating after shocks or misfortunes.

Participation, Policy and Local Governance

Local people, especially the poor, often have weak or indirect influence on policies that affect their livelihoods. Policies developed at the central level are often not responsive to local needs and may not enable access of the rural poor to needed assets and services.

Livelihoods diversification and enterprise development

Diversification can assist households to insulate themselves from environmental and economic shocks, trends and seasonality – in effect, to be less vulnerable. Livelihoods diversification is complex, and strategies can include enterprise development.

Natural resource conflict management

Resource conflicts are often about access to and control over natural assets that are fundamental to the livelihoods of many poor people. Therefore, the shocks caused by these conflicts can increase the vulnerability of the poor.

Institutional learning

The institutional learning sub-programme has been set up to ensure that lessons learned from cross-departmental, cross-sectoral team work, and the application of sustainable livelihoods approaches, are identified, analysed and evaluated for feedback into the programme.

Capacity building

The capacity building sub-programme functions as a service-provider to the overall programme, by building a training programme that responds to the emerging needs and priorities identified through the work of the other sub-programmes.

People-centred approaches in different cultural contexts

A critical review and comparison of different recent development approaches used in different development contexts is being conducted, drawing on experience at the strategic and field levels in different sectors and regions.

Mainstreaming sustainable livelihoods approaches in the field

FAO designs resource management projects worth more than US\$1.5 billion per year. Since smallholder agriculture continues to be the main livelihood source for most of the world's poor, if some of these projects could be improved, the potential impact could be substantial.

Sustainable Livelihoods Referral and Response Facility

A Referral and Response Facility has been established to respond to the increasing number of requests from within FAO for assistance on integrating sustainable livelihood and people-centred approaches into both new and existing programmes and activities.

For further information on the Livelihood Support Programme,
contact the programme coordinator:
Email: LSP@fao.org

LSP WORKING PAPERS to June 2004

- Baumann P., (July 2002) **Improving Access to Natural Resources for the Rural Poor: A critical analysis of central concepts and emerging trends from a sustainable livelihoods perspective.** FAO, LSP WP 1, Access to Natural Resources Sub-Programme.
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