Multifunctional agriculture making a difference in the highlands of Cameroon

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Introduction
The western highlands (West and North-West regions) of Cameroon cover a surface area of about 3.1 million hectares. The topography is undulating and the vegetation is predominantly savannah with patches of gallery forest and montane forest containing a variety of agroforestry tree species. The population density is quite high with an average of 90-300 inhabitants km$^{-2}$. The most striking feature of this region is the high cultivation intensity. About 40-75 percent of the total area is planted with annual and perennial crops – cereals, legumes, root crops, market gardening, fruit trees, cash crops like coffee, cocoa, tea and oil palm. Modern agriculture promoted mainly these cash crops and intensively farmed staple food crops like maize, beans cassava, and yams; and in some areas domesticated livestock on free range. Typically, however, the farm size in highlands of Cameroon just like in other African countries is often less than two hectares, so farming is focused on providing for the needs of the household and seldom on providing food for sale. Consequently farmers are not generating income and remained very poor. Against this background modern agriculture has dramatically increased yield potential of many staple food crops and the consumption of a diet increasingly based on starch-based foods like cassava, maize and the reduced consumption of traditional foods resulting to unbalanced diets, malnutrition and a greater susceptibility to disease.

The World Agroforestry Centre (ICRAF) through its Agroforestry Tree Domestication program has been empowering smallholder farmers to help themselves climb out of poverty, malnutrition and hunger, while at the same time creating more environmentally sustainable farming systems.

Program Approach
The approach integrates agriculture, agroforestry, the marketing of agricultural and tree products, through a self-help package for poor smallholder farmers based on capacity building and communication. The process involves three steps (Figure 1). 

General Outcomes and Successes
Expansion of tree domestication innovations
Today an agroforestry network involving over 10,000 farmers from more than 200 communities, supervised by 15 Relay Organisations (Non-Governmental Organisation or Community Based Organisations) put for Agroforestry (Figure 2) exist. The number of farmers who have received training has varied from one RRC to the next. At least 2500 farmers have received training by farmer trainers since 2007 (Table 1).

Table 1: Farmers trained by NGO/ farmer trainers

<table>
<thead>
<tr>
<th>Type of Training</th>
<th>Number of farmers</th>
<th>Number of NGO/ farmer trainers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>2500</td>
<td>15</td>
</tr>
<tr>
<td>Improved tree</td>
<td>2000</td>
<td>10</td>
</tr>
<tr>
<td>Fertilizer tree</td>
<td>500</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 2: Species diversity in nurseries in the highlands of Cameroon

All the RRCs have promoted ‘fertilizer trees’, such as Calliandra calothyrsus, Acacia imparifolia, Termesia serotina and Ricinodendron hoffmannii. The increased yield will allow the farmers to plant a smaller area of food crops and increase the share for other types of crops, to meet their other needs. Many communities have also become bee-keepers and in some communities everyone now has access to honey thanks to leguminous trees. This initiative has placed RBA in the top 50 of the top 100 of the EQUATOR INITIATIVES of 2010.

Impact of Multifunctional Agriculture
The most important and exciting thing about this program has been the wide range of positive livelihood impacts that are transforming peoples’ lives (Tchoundjeu et al. 2010). These impacts include: a feeling of empowerment from increased knowledge and success; the recognition of a pathway out of poverty; retention of youth in the villages due to career opportunities; and enhanced livelihoods from improved nutrition, better health and increased income: greater access to children’s school needs, home improvements, etc.

Conclusion
This project is an excellent example of how multi-functional agriculture delivers social, economic and environmental sustainability and raises poor people out of poverty, malnutrition and environmental degradation. The prime purpose was to get people out of poverty in rural Africa. The approach uses ‘fertilizer’ trees to improve soil fertility, and then to generate income from selected cultivars of indigenous fruit and nut trees which have local and regional markets. These tree products then need processing and trading, which creates opportunities for employment and entrepreneurship. In this way we are trying to generate other jobs in the rural economy, so that some farmers can become processors, case-sellers, traders, fabricators of processing equipment etc.

The technologies and practices adopted are not specific to any agro-ecological zone or country and are already in practice in many countries of Africa, Latin America, Asia and Oceania; in both humid and semi-arid climates.

Acknowledgement
This program was funded by International Fund for Agricultural Development (IFAD), United States Department of Agriculture (USDA) and the Government of the Republic of Cameroon.

Further reading
• A WINDOW ON A BETTER WORLD: An innovative Agroforestry development programme is transforming lives and landscapes in rural Cameroon. Tree of Change Booklet series No 5.
• THE FRUITS OF SUCCESS: A programme to domesticate West and Central Africa’s wild fruit trees using modern, improving health and stimulating the rural economy. Trees for Change Booklet Series No 4.

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Figure 1: Flow diagram of agroforestry as a delivery mechanism of multifunctional agriculture. Source Asaah et al. 2010

Figure 2: North and North West Provinces of Cameroon showing location of Rural Resource Centres and satellite nurseries.

Figure 3: Rooted nursery of native trees of (a) Canthium edule (Salai) and (b) Citrus limon (lemon) showing early fruits on small plants

Figure 4: Improved maize yield following 2 years of an improved fallow based on the ‘fertilizer tree’ (a) Calliandra calothyrsus and (b) Cajanus cajan.

Figure 5: Improved maize yield following 2 years of an improved fallow based on the ‘fertilizer tree’ (a) Calliandra calothyrsus and (b) Cajanus cajan.