Integral Farm-Household Management for Food Security & Sustainable Livelihoods in Uganda

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Abstract

Integral Farm-Household management involves learning and adopting appropriate resource-using techniques both on farmland and in the associated households. Significantly, as elsewhere among longstanding rural communities, in rural Africa there is no separation between home and work; both environments merge. Typically, policy-makers seek 'single issue', easily measurable solutions to rural development challenges. Field realities are more complex involving many inter-related factors if both food security and sustainable livelihoods are to be achieved. This paper reports one such training and implementation case study from Uganda where integral management (blending all relevant resources to deliver sustainablity) is being attempted. The CADeP (Congregational Agricultural Development Programme) began in 2005 and extended at the time of this research in 2008 to 31 farms situated in central, eastern, south-western, western and north-western Uganda.

Introduction

Integral management is the art of blending all resources relevant to a sustainable future into a strategy for pragmatic implementation. Press (1980) defined management as 'the greatest of the arts, since its medium is human talent itself.' While there are certain scientific (or logically sequenced) approaches – such as management by objectives - that can be taken, neither management nor economics should be treated as equivalent to the physical sciences (Soros, 2008). The danger of doing so is that management becomes specific and target-oriented such that policy-makers seek so-called 'silver bullet' solutions to realities that focus on a single factor as an attempted corrective to problems. This is analogous to the kind of cropping trials that simply vary the input of a single nutrient, with all other factors kept as constant as possible. Conversely, as pointed out by Turner & Wibberley (2009) 'integral management attempts to deal with reality holistically. It is applied to real resources of land/nature, labour, capital and entrepreneurship blended to secure a sustainable future. The management process must creatively balance these resources in order to reflect the complex and comprehensive character of sustainability. This is an art! It is also an applied science in that it depends on systematic measurement and analysis of real resources and their subsequent recombination in a planned way to achieve agreed objectives (the integral components of sustainability).'

Sustainability incorporates the range of factors listed in Fig.1. The concept of sustainability might best be encapsulated as 'for the grandchildren'. Thus, the farm manager must 'not only look after the day-to-day farm work but also take care of the long term interests of the farm for future generations' (Joy & Wibberley, 1979). Such integral management requires simultaneous attention to the essentials for a sustainable future proposed by Wibberley (1989) viz:- ecology, economy, energy-efficiency, employment, equity and ethics. Ethics integrates all the previous five aspects; what is good, right and fair must take account of all these variables.

Fig.1. Components of Sustainability

GRANDCHILDREN – intergenerational inheritance
RELATIONSHIP CONSERVATION – rural community life and values
LOCAL SELF-RELIANCE – indigenous technical knowledge and skills
PRODUCTIVITY - to meet present and future needs of the population
PROFITABILITY – to enable investment for future caring and sharing
RELIABILITY – consistency of performance under varying conditions
RESILIENCE – flexibility to withstand and adapt to constraints
APPROPRIATENESS OF TECHNIQUES – to both user and environment
REPLENISHMENT OF RENEWABLE RESOURCES – avoiding exhaustion
PROVISION OF ECOSYSTEM SERVICES – water, carbon-sink, tranquillity
ENVIRONMENTAL PROTECTION – against erosion and pollution
BIODIVERSITY MAINTENANCE – of both wild and farmed species
ADAPTABILITY – to changing global circumstances, including climate change

In countries such as Uganda with a predominantly small and family farm structure, the farm itself cannot be seen in isolation as a business separate from the homestead. Neither can agriculture be developed internationally in isolation from the considerations of the whole planet as the habitat of humanity. Thus the approach of Farming Systems Development (FSD) proposes the basic unit as the Farm-Household (FAO, 1989).

Integral management for sustainability with the Farm-Household as the basic unit offers the guiding principle for the CADeP (Congregational Agricultural Development Programme) and its impacts to date (2005-2008), which are here summarised as a case study.

Uganda land, population and food

Some 982 million people world-wide were reckoned as food insecure in 2007 and this number, contrary to Millennium Development Goal 1 ('Eradicate extreme poverty and hunger'), is likely to rise to 1.2 billion by 2017 (USDA, 2008). Uganda, which had a population around 7 million at independence in 1962, had around 31 million or more by 2008 and, at the present growth rate of 3.6% per annum, is predicted by the UNDP to reach 130 million by 2050. There are already some 1.7 million Ugandans who are reckoned food insecure. Of these, some 1.2 million are in the conflict-torn Northern region, some 0.275 million in drought-affected Karamoja (NE) and around 0.2 million affected by floods between these two zones (Mukalazi, 2008 – USAID data). Apparent climate change impacts pose huge additional challenges involving mitigation and adaptation to pursue Uganda's agricultural output requirements for food security (Mortimore & Manvell, 2006).

Food Security is the relative availability of dietary requirements that are accessible, affordable and attainable avoiding hazards. Of course, the highest degree of food security might be associated with growing all of one's own family and community needs as locally as possible so that transport costs and possible interruptions of supply chains are avoided or minimised. Already, increasing urbanisation means that food has to be transported from further rural areas,

although internationally there are futuristic moves to grow foods from microbiological sources and other 'factory-farmed' multi-storey units in cities. Attainment of food security and sustainable livelihoods more conventionally using farmland are urgent for Uganda. These are the key goals of CADeP.

Background to CADeP

CADeP, the Congregational Agricultural Development Programme, began in 2005 among communities of religious Brothers and Sisters of the Roman Catholic Church in Uganda. It involves training in Sustainable Organic Agriculture (SOA) and provision of inputs to improve agricultural practices and farm-household facilities. In mid-2008, 78 had completed training. Training and extension liaison is delivered by *Kulika* Trust, Uganda, an NGO with 25 years practical experience of field training and promotion of SOA and improved household technologies. *Kulika* Trust, Uganda supports community development initiatives, education programmes and related research. In 2008, since its inception in 1983, 1512 students had become professionals through *Kulika*'s educational scholarships and over 7000 farmers have improved livelihoods as a result of *Kulika* training (Kyamuwendo, 2008). *Kulika* staff provide CADeP training. Training and extension itself needs to be provided in a sustainable way (Wiibberley, 1997, 1998; Kyamuwendo, 1999).

As well as practical, farm-based skills training, CADeP offers material items such as tools, workers' housing and 10,000-litre water tanks. Material items offered through CADeP are crucially synergistic to attainment of goals for adoption of the training in order to achieve food security and to promote sustainable livelihood income generation. Funding is from The Netherlands. CADeP is run by a 6-member Core Team. In order to promote local sustainability of mutual learning among farmers, development is envisaged of *FARMS* - Farm Asset Resource Management Study - Groups (Wibberley, 1997; Kyamuwendo, 1999; Wibberley, 2008a).

Methodology

A participatory evaluation conducted during July 2008 (Wibberley, 2008b) involved all relevant stakeholders including CADeP-trained people, farm workers, other community members, neighbours, Superiors (Congregational overseers) and the Core Team of six managing CADeP. It comprised visits to 31 farms of religious communities – 23 of Sisters and 8 of Brothers - on a 2,500-mile route around Uganda from central areas to Jinja in the east, to the south-west, western and north-western areas (Gulu and Nebbi). Documents from CADeP were examined, questionnaires analysed, interviews and discussions held, and many photographs taken.

The sequence at each visit (of typically 3+ hours) was:-
a) Greet and meet available members of the community and ask the local Superior and/or the CADeP-trained member to provide background information using a *proforma*. This enabled us to gain an overview as well as to establish a *rapport* with the respondent(s).
b) Request that one CADeP-trained person fill the farmers' questionnaire, and the Superior complete the appropriate management questionnaire while we visited the farm and farm household facilities with another CADeP-trained person or member involved with the farm,

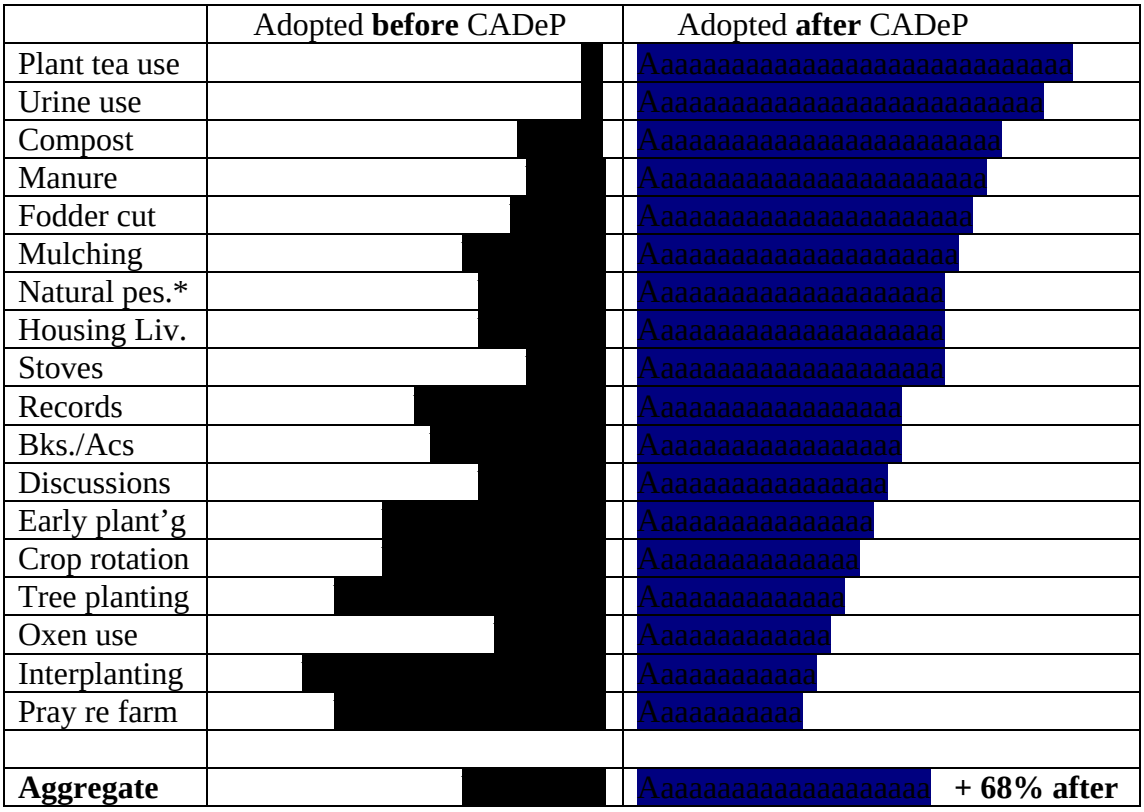
together with key farm workers where possible. This procedure was essential to ensure we had the information to take with us rather than relying on it being delivered later.
c) Farm visit taking photographs and recording observations, while also giving some input in conjunction with the *Kulika* trainer so that we were not simply there extracting information but also positively sharing ideas towards solving issues that concerned them.
d) A Group Exercise was carried out with any community members involved with farm work and the farm workers themselves where possible. In practice, we were only able to apply this in part and in some places not at all owing to the fact that many workers had not been in place long enough or our visit did not coincide with an opportunity to meet them properly. However, we did the exercise with over 130 farm workers.

We took at least a small meal at each place visited, and stayed overnight at four communities.

Improved land and natural resource management strategies

CADeP has had a huge impact on the adoption of soil conservation practices, including terracing, use of cut-off ditches, L-bridges and planting of wash-stops. Some were known before CADeP. However, the majority of the adoption of these practices has been after CADeP (Fig.2).

Fig. 2. Practices adopted before and after CADeP showing CADeP Impact.



Notes: * Natural pes. = natural pesticide use; Liv. = Livestock.

Soil amelioration and fertility-building practices have had immense benefit, including mulching, compost-making, use of plant tea, proper manure collection for composting, and use of urine in

both compost and the making of natural pesticides. Sack mounds, compost basket gardens, and other vegetable growing techniques are widely used – including raised beds, table gardens, passion-fruit trellises and plant nurseries.

Overall impacts of CADeP

The mean size of available land at the 31 farms was 240 acres (100 hectares) - some 7,500 acres in all - with a mean area of 29 acres cultivated before CADeP and 48 acres afterwards, a 66% mean increase in land utilisation. Resource management is much improved and better integrated.

Training has led to an increase in adoption of improved agricultural and farm-household practices after CADeP, reported as +68% overall. Those trained are more confident and enjoy their farming more. Some 35% began to pray specifically about their farming after CADeP. Some practices, such as usage of plant tea, urine, manure collection, compost-making, fruit and vegetable growing, have been massively adopted after CADeP, as have fuel-efficient stoves (made from termite-mound soil moulded around banana stems) and tip-taps for household hygiene. The Report (Wibberley, 2008b) reviews past training appreciation as well as future training needs and shows that soil management, composting and cropping improvements have been most valued while management topics such as farm planning and book-keeping, together with animal health and husbandry are the most sought as follow-on teaching (Fig.3). Some local workers have been motivated and engaged with the learning and adoption too – via participation in week-long 'caravans' touring other farms to 'look and learn' about new techniques and their impacts. At some places, micro-enterprises have begun with consequent livelihood enhancement.

Fig.3. Relative Usefulness of Topics in CADeP training received

Agricultural Skills	
1st SOIL MANAGEMENT	##########
2nd COMPOST-MAKING	#########
3rd CROPPING METHODS	######
4th WATER MANAGEMENT	#####
5th LIVESTOCK MANAGEMENT	####
Office/Management Skills	
1st FARM PLANNING	##########
2nd RECORD-KEEPING	########
3rd BOOK-KEEPING & ACCOUNTS	######
4th STORAGE/PROCESSING/MARKETg.	#####
5th TOOL CARE & INVENTORY	####

Impacts have not simply been quantitative in terms of more land cultivated and better yields (*matooke* – green cooking banana - yields are reckoned to be 15-90% - mean 50% - better. Some claim crop yields have doubled, trebled or more). Qualitative improvements concern better diets, healthier communities and the widely evident conquest of food insecurity. The health benefits of their more varied diet with vegetables (especially greens), fruits and juices, together with more regular meals are universally acknowledged. This was evident not only from the meals we were served during the evaluation but also from the demeanour of all we met. There is clear impact

indicated by increased enjoyment from the improved understanding of their farm work with better results from it. All testified to fewer days of sickness among their members. Furthermore, savings on expenditure for bought-in food owing to expanded home production are greatly valued by Congregational Superiors. However, there are challenges in persuading them that farms need to retain some profits in order to reinvest and to maintain or upgrade their infrastructure.

Technical impacts include substantial increases in adoption of early planting (before the onset of rains), of fruit trees, of crop rotation and of interplanting. Regularity of weed control was not always as good as it could be and this will impact yields more than many other factors. Two key imperatives of successful SOA are to keep weeds out and to get nutrients into the soil. These both require adequate labour and effort. Labour shortage is a real constraint for some farms studied.

CADeP has stimulated better livestock husbandry but this area of work has much further to go than the soil and cropping improvements seen. It is logical in SOA that one starts by improving the soil and its cropping. Extra attention will be needed in the immediate future to livestock management. Areas where CADeP has made a technical impact are in livestock housing, with some impressive buildings seen. Along with this housing, adoption of fodder growing for zero-grazing (using Napier grass and others) and proper watering practices are paramount. Apart from proper rationing and controlled breeding, housing allows the collection of dung and urine and this has been well adopted in places but not everywhere yet. On some farms, livestock management was defective in terms of quality of housing, feeding, breeding control, and other signs of healthy animal keeping. Given that 20 of the 31 farms have piggeries already, many wish to expand them and others wish to start pig-keeping, there was a universal absence of crush bars seen in the pens used for farrowing. This lack is resulting in much higher piglet mortalities than is necessary and needs to be addressed urgently, as does the toughness of flooring used in many of the pens seen – in order to lessen parasite risk, especially from *Ascaris lumbricoides*.

There is considerable scope for increased use of oxen and it is encouraging to see that CADeP is making some impact here but there is far to go. In particular, the use of ox-carts for haulage could be very strategic and hardly seems to have registered in the programme at farm level.

In the case of poultry, there is surprisingly little use of guinea fowls, which being indigenous to Africa are rather better adapted than many poultry – and they are good alarm-raisers as security against thieves, as are geese.

Farm Household Improvements

Rural households in Uganda can typically spend some 6 full-time person hours collecting water each day, though this may often be done in teams (Kinyengere-Mango & Wibberley, 2006). Furthermore, roof-water when not captured by guttering and water tanks causes immense erosive damage to surrounding compounds. In this context, the CADeP emphasis on providing roof-water tanks is extremely strategic. A few have added their own home-made solutions to capture further water from additional roofs, or even from growing banana stems by bending backwards the outer leaf sheath and catching the water so diverted in a drum. Bamboo is found but seldom deliberately planted. Apart from providing for plant supports in gardens, larger bamboo is a useful construction material for fences, shade roofs and furniture. The largest can be made into

guttering for water capture and conveyance. This simple, renewable technology awaits development within CADeP.

It is heartening to see the adoption of hygiene measures in the form of tip-taps almost everywhere, some with the novel addition of a collecting bowl so that water used is not wasted but can be put onto tree seedlings nearby. Drying racks for kitchen utensils, pots, plates and cups are also widely used.

Though there are fuel-saving Larena and/or Ddembe stoves made at most places (84%) some are not used regularly and there is still frequent co-existence of '3 stones' cooking alongside improved stoves. The reason for this given by many is that the 3 stones plus pot can be boiled more quickly. The solution to this understandable but counterproductive thinking is:-

- to teach planning to start cooking earlier;
- to continue using the improved stoves (which get better with use);
- to extend the stove chimney so that it can draw better and thus heat quickly when needed;
- to develop the notion of heating control by means of woodash to damp down while using temporarily restricted airflow at the entry point to speed up burning initially;
- to teach the improved nutritional value of slower cooking.

There is much scope to develop training on adding value and preventing waste through food processing and preservation - notably using solar driers for surpluses (Namutebi *et al*, 2007).

Positive environmental impacts are potentially huge. Greater tidiness of compounds and their use for demonstration of underutilised tree species and other improved practices could have considerable future impact. *Send-A-Cow* in Uganda (www.sendacow.org.uk) has recently done studies showing huge positive impacts of a single cow or dairy goat on Farm-Household System vitality and viability – and in such integrated systems that the carbon-footprint (notably methane + manure) is offset by recycling, by growing fodder crops and by tree planting so that over 5 years it is 2.5 times positive! Alongside fuel-efficient moulded mud stoves, more tree planting is also needed, as widely advocated and implemented in Kenya and elsewhere (Maathai, 2007).

Policy Implications, Discussion, Conclusions and Recommendations

CADeP merits not only continuation but initiation elsewhere in Uganda and beyond. The combination of training, access to key material inputs and harnessing of existing resources provides improvements that other ordinary farm-households can emulate. Expanded basic training is warranted, and inclusion of more on livestock topics and on farm management for those already trained. The programme needs to be rolled out to surrounding communities using *FARMS* (Farm Asset Resource Management Study) Groups, training Community Animal Health Workers (CAHWs) to give basic veterinary healthcare, and encouraging the formation of Junior Conservation Societies with 'Best-kept Village' competitions to enhance habitats.

Improved analysis and use of records kept could be assisted by providing new *proformas* to ease recording without creating unnecessary bureaucracy. Eventually, CADeP could have a bank of data to be treated confidentially and used anonymously for comparing farm performance to stimulate widespread agricultural improvement.

Some farms are already producing not only *matooke* but also sweet bananas, *bogoya* bananas, and plantains for roasting. Such diversification needs to be encouraged, as does planting of sequential cabbages of different varieties. Marketing is vital with the warning caveat that - for sustainable livelihoods with food security - farms should produce first for the local 'family', then for proper animal feeding and only thirdly for the market.

Farmers appreciate CADeP training and positive impacts of its adoption on their livelihoods, lifestyles and community relationships (Fig. 4). However, benefits can yet impact community organisations more.

Fig. 4 . CADeP FARMERS' OPINION SCORES : largely affirmative

KEY:- **5 = Strongly agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly disagree**

4.7 : As a Farmer, I feel our CADeP programme really belongs to us Farmers
4.7 : As a Farmer, I intend to continue to use better farming after CADeP support ends
3.3 : CADeP requires too much attention to detail in farm management for my liking
4.1 : The thing I like most about CADeP is provision of training I can't easily afford or get
4.8 : CADeP has helped me to become a better farmer
4.7 : CADeP has helped our household to gain better food security (some & to spare)
4.6 : CADeP has helped me enjoy the challenge of farming more & to trust God more
3.9 : CADeP has improved the balance of good relationships within my family
4.5 : CADeP has improved the balance of good relationships within our congregation
4.5 : CADeP has improved the balance of good relationships within our community
4.6 : CADeP has given me hope
4.5 : CADeP involvement has shown me the importance of training for livelihoods
4.7 : CADeP has enabled me take responsibility in my congregation
3.8 : CADeP has enabled me take responsibility in community organisations.

It is recommended that integral management is applied on farms for the simultaneous attainment of the following six inter-related essentials for sustainable development, viz:-

- ECOLOGY: biodiversity, habitat, community and ecosystem services maintenance
- ECONOMY: conservation of resources for food, fibre, water, energy, livelihood security
- ENERGY-EFFICIENCY: balancing energy inputs and energy outputs per hectare
- EMPLOYMENT: maintenance of links between creative jobs and place - 'there to care'
- EQUITY: pursuit of justice in the production, processing and marketing of farm outputs
- ETHICS: enabling what is good, right and fair for genuine agricultural progress.

Farmers do not consider too arduous the required multi-disciplined rise in farm management standards for integral management. Its adoption has visibly improved the farmed landscape, the faces of participants and the integrity of relationships. Above all, as *per* CADeP's objectives, people have greater food security and more sustainable livelihoods than before its inception.

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Section 2. Farm Management, preferably, OR Section 5.Education & Training

PAPER FOR NON-PEER REVIEW (unless desired to be so)

WORD COUNT

Exactly 3,500 – including all tables/Figures but excluding abstract and references, of course.

AFFIRMATION

All this is our own original work, both in the field and in writing and has not been published elsewhere.

Elijah Kyamuwendo farms with his family in Mubende, Uganda. After serving as Sustainable Agriculture Co-ordinator of Kulika Charitable Trust, Uganda, he became its CEO. His MSc thesis at Wye College, University of London covered adaptation to Uganda of *FARMS* Groups (as developed between 1977 and 1992 by co-Author John Wibberley).
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