

## VIBRANT AGRICULTURAL MANAGEMENT MESSAGES FROM AFRICA

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### **Abstract**

*Sub-Saharan Africans are often frustrated by bad news emanating from their continent, including mismanagement stories and prognoses of agricultural failure. While acknowledging the huge challenges facing Africa, this Paper (widely illustrated from several African countries) seeks to identify key factors involved in a range of agricultural management practices and contextual realities which are actually successful and offer further potential. Innovative and sustainable management practices are pursued in Africa with vigour in many places, affecting soils, crops and animals through mixed cropping, conservation farming, groupwork, multiprofessionality, part-time farming, use of mobile telephones in farm produce marketing and various strategies for food security through strengthening local Food Chains.*

*Keywords: Africa, sustainability, management*

### **Introduction**

Too often, Africa is perceived as a target for management messages rather than a source of them. However, in addressing ‘the challenge for balance’ in the quest for ‘a vibrant rural economy’ this Paper argues that Africa has much to teach us. Africa’s Economy has a long and distinguished history (Batchelor, 1993; Hugon, 2004) predating much of that in Europe, despite the substantial blot on both records of slave trading, officially abolished two centuries ago (1807) by the British parliament. It remains a huge challenge that 32 of earth’s 37 poorest nations are in Africa.

Mebrahtu (1984) recognised the need to learn from Africa and compiled evidence of positive lessons from Africa, including those from agriculture (Wibberley, 1984). Based on their agricultural experience in Africa, Joy & Wibberley (1979) compiled lessons drawn from African agriculture, Omara-Ojunga (1992) described wider rural resource management, while Gwaivangmin & Wibberley (2004) presented a case for agrarian advocacy in sub-Saharan Africa. Real progress is not equated with growth and materialism but with stability and sustainability achieved by equitable management of natural resources from generation to generation (Tevera & Moyo, 2000). Examples to show that such progress is attainable exist throughout sub-Saharan Africa and some of them are presented here to illustrate the management messages they convey. An accompanying ‘powerpoint’ presentation provides visual evidence.

### **Biodiversity, Energy-Efficiency & Integrity of African Farm-Household Systems**

Experience of the author in the 1970s in West and East Africa showed the importance of mixed cropping as a risk-reducing, biodiversity-encouraging strategy of tropical farmers. It indicated that sustainability from intercropping favoured in Nigeria (Norman, 1974; Okigbo & Greenland, 1976; Joy & Wibberley, 1979) conflicts with the tendency towards monocultures favoured for simplicity of analysis by development agronomists – as previously noted by Masfield (1949).

Farmers' stated management reasons for adopting mixed cropping are various but include:-

- better use of the soil environment – water, rooting and multi-storey aerial space
- reducing negative factors – weeds, pests, diseases - through biodiversity
- soil protection against erosion by leaf canopy cover and root-binding activity
- complementarity – e.g. legume N-fixing, shade provision, positive root exudate effects
- better return on labour by shared cultivations, less weeding need
- more dependable returns from season to season than from sole cropping
- extended supply period for perishable foods
- obtaining a crop while long-term crops establish e.g. *taungya* (vegetables in young teak)
- provision of a site for minor crops which would be vulnerable in pure stands.

No or low cost disciplined management of crops also plays a vital role. Data from field trials conducted in 1975/6 in Northern Nigeria on *Sorghum* with and without weeding, showed the impact of proper weeding management coupled with the adoption of an improved variety; the local tall variety (*Farafara*) showed a 74% response to weeding three times, while the improved dwarf variety (Short *Kaura*) gave a 38% response to proper weeding and gave a 13% better yield with weeding than did *Farafara*.

Referring to the Kano close-settled zone of Northern Nigeria more than a century ago, Morel (1911) wisely commented “the fields themselves are protected from incursions of sheep and goats by tall, neat fencing of guinea-corn [*Sorghum*] stalks, or reeds, kept in place by rope of uncommon strength ... Equally astonishing are the irrigated farms ... on the banks of water courses ... plots marked out with mathematical precision ... divided by ridges with frequent gaps permitting of a free influx of water from the central channel, at the opening of which, fixed in a raised [bird-scaring] platform, a long pole, with a calabash tied on the end of it, is lowered into the water and its contents afterwards poured into the trench ... conditions ... technique ... and industry displayed by the farmers of one district vary a good deal from the next. In the northern parts of Zaria and in Kano, the science of agriculture has attained remarkable development. ***There is little we can teach the Kano farmer. There is much we can learn from him*** [emphasis mine] ... every scrap of fertilising substance is husbanded by this expert and industrious agricultural people. Instead of wasting money ... ‘teaching modern methods’ – a deluded notion – to the northern Nigerian farmer, we should be better employed endeavouring to find an answer to the puzzling question of how it is that land which for centuries has been yielding enormous crops ... can continue doing so. What is wanted is an expert ***agriculturist who will start out not to teach but to learn***; who will study for a period of , say, five years the highly complicated and scientific methods of [indigenous] agriculture, and base possible improvements and suggestions, may be for labour-saving appliances, upon real knowledge.” King (1910) drew similar conclusions in the Far East. Mortimore (2005) confirms contemporary wisdom among other dryland farmers in West Africa. Farmers are likely to learn new techniques when they see them in practice on other similarly resourced farms rather than on abundantly equipped research stations.

Survival capabilities are astounding among nomadic pastoralists in the vulnerable environments of Turkana & Karapokot in NW Kenya. Respect for farmer survival & communal solidarity grows with increasing appreciation of the supremacy of wisdom over literacy for survival.

Energy-efficiency is perceived to be a key factor for sustainable farming systems – and exemplified by those found in the Tropics, including Africa (Rappaport, 1971). African Sustainable farming systems justify analysis, promotion and improvement rather than being jettisoned and replaced by high input dependent, high-risk ‘imported’ systems.

### **Farmers Together: Mutually Strategic Management**

African societies think and act communally much more naturally than do those of Western nations (western Europe and North America) and yet it is the literature and thinking of western nations that dominates world media. However, ‘*The pot starts boiling from the bottom*’ (Ibo proverb, Nigeria). Village ecological & farmer surveys were conducted in Benue and Plateau States of Nigeria during the mid-1970s as a prelude to work among farmers and a book resulted (Joy & Wibberley, 1979). A survey of 145 farmers in Benue and Plateau States by the present writer in 1975/6 revealed that farmers co-operated considerably:- 73% in harvesting, 69% in planting, 57% in buying, 55% in selling and only 9% not at all. The top aspiration of these farmers was to produce enough food to sell some, or at least to achieve complete family food security – and two-thirds of them practised mixed cropping. Direct experience in well over 50 countries now shows that farmers everywhere prefer to learn from other farmers – ideally from those similarly placed as to soil, climate, land size and market opportunities, but evidently managing their resources better than most farmers. The care and consequent appearance of landscapes is principally the result of farming activity – much of it good and capable of emulation by other farmers if encouraged.

Southern African work of the author during the 1980s confirmed the crucial role of farmer motivation and group work benefits – and the greater propensity to work communally for mutual benefit which is more characteristic of African than of European rural cultures. Extension education via Farm-Households and the perception of the Farm as a Farm-Household System is still mirrored more evidently in African small-scale agrarian structure than in Europe, Australia and North America (FAO, 1989; Moris, 1991).

More concern on equity issues in extension/agricultural development has emerged. Also of growing importance are participatory, farmer-interactive approaches in local problem-solving & extension – such as the **FARMS** (Farm Asset Resource Management Study) Groups long advocated and catalysed by the author for over 30 years (e.g. Wibberley, 1995,1999). Many African farmers have faced the challenge of livelihood survival in recent years and need to assess all their farms’ assets as potential resources for improved management in order to gain a sustainable livelihood. In Africa as elsewhere, it appears that farmers prefer to learn from other farmers (practitioners of any kind prefer to learn from other practitioners). Therefore, on-farm study together in a practically-focused, farmer-led group with a farmer-chosen agenda provides suitable opportunity for this and for trust to grow. Without trust, any sort of collaborative business co-operation cannot work. Such future collaboration may be in the interests of group members but farmers themselves must decide if this is to be so *after* they have come to know and trust each other - which occurs most naturally during learning together. Farmers who learn together may decide to earn together. From reciprocal trust, other mutually beneficial co-operation may arise later, such as buying inputs, sharing equipment or selling outputs together.

The Africa Co-operative Action Trust (ACAT – [www.acatkzn.co.za](http://www.acatkzn.co.za)) began in South Africa in 1979. ACAT provides training and a means of setting up Savings Clubs among farmers within which they also learn and share improved management practices. Over 4000 of these have been set up across South Africa and Swaziland. They have led to a host of other development initiatives in rural communities –including shared processing and selling of agricultural produce based on mutual trust developed through group work in the Savings Clubs. ACAT has improved resource management by emphasising sustainable agriculture, the crucial role of enterprise and the community-building value of engendering mutual interdependence.

### **Conservation Farming (CF): The Case of Zimbabwe & Zambia**

Conservation Farming (CF) is variously described as reduced cultivations, minimal tillage, zero tillage or no-till. These refer to the principle characteristic of the system. Briefly, it also involves early planting at the onset of the rains, disciplined spacing, correct depth of planting, careful nutrient placement (compost

manure or fertiliser) and regular weeding. According to ACT (2003) CF has three chief characteristics, which describe the main features recognised for centuries by wise African farmers as crucial to survival, viz. the simultaneous practice of:-

- a) minimal soil disturbance; b) permanent soil cover; c) crop rotations/associations.

Oldreive (1993) developed it both on a mechanised field scale and for small-scale hoe farmers in Zimbabwe, where it has proven successful on all but the sandiest of soils. Its recent uptake in Zambia, catalysed by Zimbabwean experience, has been dramatic (Haggblade & Tembo, 2003) since it has been encouraged there by both the Ministry of Agriculture and the National Farmers' Union (CFU, 2003). Keys to CF success in Zambia are that it is practical farmer led with a motivated extension team, adequate fertiliser is used to get good yields (Wibberley, 2006a), adaptive technology is introduced, biodiversity is fostered and farmer-to-farmer adoption is encouraged – already some 15% of all farmers are adopting some CF for maize, cotton and other crops. There is ongoing endorsement from the Zambia National Farmers' Union and the Government of Zambia. In particular, they have kept their focus on agronomic management and extension (liaising with other organisations regarding storage, marketing and nutrition issues).

In the Genetic Modified (GM) organisms debate *pros* and *cons*, Zambia has declared its intention to remain GM-free (Rees, 2006)<sup>1</sup>, while other countries such as neighbouring Malawi have announced their intention to pursue GM biotechnology.<sup>2</sup> A key issue is corporate control of GM seeds and other organisms and the loss of farmer flexibility and independence. The case for and against GM crops is briefly summarised by Wibberley (2007).

### **The Baobab: Africa's Symbolic Multi-Purpose Tree – A Case Study Inspired in Tanzania**

Indigenous African species are often underutilised, and neglected by western agriculturalists. Among animals, the guinea fowl and the ostrich are relatively unfarmed, while among plants both *Artemisia* and Baobab offer largely untapped potential. Trees are particularly strategic for multiple uses in African villages (McNamara & Morse, 2004). African farmers have used their own creatures imaginatively over centuries, as shown by a brief review of the Baobab inspired by field studies mostly in Tanzania.

The French name for the Baobab is '*L'arbre de mille ans*' (the tree of a thousand years). It is indeed reckoned that the Baobab (*Adansonia digitata* of the Family *Bombacaceae* with cousins including both Kapok and Balsa trees) can live for 1000 years or more - perhaps as long as 3000 years. Being fire-resistant, Baobabs remain as relict trees after bush fires. The Baobab has other names reflecting its many uses, such as 'Monkey Bread' and 'Indian Cork'; in Arabic it is *Tebeldi*, in Hausa it is *Kuka* and in Kiswahili, *Mbuyu*. It is symbolic - perhaps notably when called 'the upside-down tree' and in many ways parallels the Biblical tree description (Gen.2:9) being both 'pleasant to the eyes and good for food'.

Baobabs thrive in seasonally dry areas throughout sub-Saharan Africa from sea-level up to around 1250 metres. Though drought-hardy, they prefer well-drained soils of high water table. Their appearance when mature is unmistakable with a wide girth - up to 9m diameter - and squat appearance (only 12-20m tall), having the branches bare for up to 9 months of the year and spreading to give the impression that they are roots heading skywards instead of groundwards; hence 'the upside-down tree'. It does not grow steadily from year to year and can even shrink, which probably accounts for its adaptation to seasonal drought and to areas with high coefficients of variation in annual rainfall.

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<sup>1</sup> It is also of interest in the context of IFMA16 in Cork that Ireland also declared some 1,000 GM free areas in 2005.

<sup>2</sup> Reuters, 14<sup>th</sup> December 2004 on Zambian biosafety legislation; Malawi Formulates National Biotechnology Policy Rebecca Chimjeka, *African News Dimension* 16.8.'06.

The typically 5-leaflet compound palmate leaves when young are cooked as a tender vegetable, as are young shoots, which are vitamin and protein rich. Elephants eat whole saplings of up to 3 years old. The large (around 12cm diameter) creamy white flowers provide bee forage and the tree is commonly used as a place to suspend both traditional and improved beehives. Especially at nightfall, they also attract pollinating fruit bats through their rather sickly-smelling nectar. The mature flowers are eaten by livestock, notably goats. The large yellow-green to brownish, velvet-coated fruits hang on stalks. They are used for human consumption; the dry pinkish-white pulp around the hard acid seeds is rich in vitamin C and tastes rather like slightly soapy sherbet. The seeds are ground to add to stews; they also serve as raising agents for bread-making, probably owing to yeasts living in association with them. A thirst-quenching, syrupy juice is also expressed from the fruit. There are some 100 seeds of about 1cm size each per fruit, which weigh out at around 1500-2500 per kilogram. Seeds are very tough-coated and of poor germination capacity. Seeds can be harvested around September/October in East Africa, light ones floated off and those remaining should be scarified and soaked in water for 24 hours prior to planting. Saplings should grow to around 2m in 2 years. Many seeds are wasted, but good farm household management results in them being planted in raised beds to grow as leafy shoot vegetables.

The wide trunk is described as 'pachycaulous', having low density and thus very soft timber unsuited as fuelwood but with potential for pulping to make coarse paper or to use as mulch with the leaves or as livestock bedding prior to compost-making. The trunk holds water well, especially when young, and it is easily hollowed out to make water pipes, gutters, water-storage containers, trays/platters, floats, canoes, carved craft items and even dwellings. House, school, prison, post-office, latrine and meeting room for worship are among the recorded purposes of Baobab trunk-rooms after hollowing out! The bark can be up to 10cm thick and has a useful cork underlayer. The bark fibre is used to make sturdy ropes, baskets, strings for local musical instruments and lines for snares, or it is woven into bark-cloth from which waterproof hats and other useful and craft items are made. The bark is harvested in panels over a number of years and, if well managed, this process does not kill the tree. Together with the roots, the bark is also a source of medicines and dyes. The wood yields gums and resins. It is an important shade tree, planted by farmers to mark land divisions. In short, apart from being an ornamental symbol of Africa, the Baobab is thoroughly useful. Traditionally, creative African rural resource management has been applied in the case of this tree but knowledge of its comprehensive uses is being lost in the wake of 'progress' which urges specialisation in monocropped commodity crops.

### **Resource Management & Food Security in Africa: The Case of Malawi**

Respect is merited for farmers as resource managers and for the key role of farmer-interactive extension in Africa (Wibberley, 1999). 'Food Security' is a challenge for management and a relative rather than an absolute concept (Devereux & Maxwell, 2001). Food Security is about each person having more rather than less of their food locally available, accessible, affordable, and avoiding undue risks and unnecessary waste in getting it from land to mouth. It is not about eliminating trade, but it is about optimising locally grown food products everywhere. 'Food Sovereignty' (Windfuhr & Jonsén, 2005) is about each nation having greater control over its own food policies in order to enable such food security to be attained as a key in national and international security. Malawi has a challenge to 'tame hunger' (Kanyama-Phiri, 2005). Excellent work has been done to connect food and nutrition in Malawi by Stacia Nordin and published under the World Food Programme (Nordin, 2005).

Attaining Food Security requires a comprehensive management strategy involving appropriate technology as recommended for Malawi (Wibberley, 2006b)<sup>3</sup>:

1. More **FARMS** (**F**arm **A**sset **R**esource **M**anagement **S**tudy) Groups, locally-owned

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<sup>3</sup> Also, Wibberley, E.J. (2005) Globalisation, Farming & Food Security: addressing the challenges. Paper for Public Lecture, Malawi – given at the British Council, Lilongwe & Bunda College, UNIMA (September, 10 pp.)

2. Model **Primary Schools** with farms using locally appropriate technologies can be crucial
3. Support College, University & **Extension/Advisory links** with Communities/Schools<sup>4</sup>
4. Consider training/supporting '**Key Farmer Trainers**' for Schools/Communities
5. Support short **field workshops** to catalyse improved existing **resource management**
6. Support national construction of village **dams, springs & roof-water catchment tanks**
7. Encourage village/community shared **treadle pumps** to dry-season garden
8. Support the extension of **appropriate-scale replicates** of existing good practice
9. Support the extension of the '**Starter Pack**'<sup>5</sup> project until other improvements are there
10. Support survey, research and development of '**Conservation Farming**' as in Zambia
11. Promote local processing (esp. **solar drying**) and improved household **storage** of foods
12. Support the further development of '**Switch**' cards for secure food trading
13. Support the development of **mobile telephone masts** for better **food pricing 'infonet'**
14. Support **Radio listening groups** in communities for sharing of food security experience
15. Support subsidised (but NOT free) tree/plant seedling/seed **banks** e.g. *Moringa, Artemisia*
16. Support media-driven household **2-tree planting campaign** (1 fruit + 1 fodder/fuel-wood)
17. Dig shallower (but beware high W-T) **pit-latrines** & subsequent planting/care of banana
18. Support **compost-making** training, including use of human urine to enrich it
19. Support the use of **natural pesticides**, and of plants for medicinal/veterinary purposes<sup>6</sup>
20. Properly **house goats, pigs & poultry** (link to feed-rationing, better breeding, compost)
21. Encourage the use of **draft animals** for cultivations and haulage of farm goods
22. Promote locally-made termite-mound clay **fuel-efficient stoves** to at least double heat capture
23. **Add value** to farm produce :- solar-dry; juice fruits; make sauce, jam, cakes/biscuits, yoghurt
24. Promote **household hygiene** with plate-drying racks and use of tip-taps
25. Promote **bee-keeping** with trees and other attractive crops
26. Promote best kept farm, household and village **competitions**, with polythene litter removal
27. Encourage formation of '**Junior Conservation Societies**' for environmental management
28. Encourage **fish pond** construction to diversify diets and to save pressure on lakes & ocean<sup>7</sup>
29. Encourage **environmental monitoring and maintenance** groups in communities
30. Promote good resource management/information via **church demonstration compounds**.

Apart from Malawi, food security and environmental management issues have been addressed in Africa by the author and colleagues – together with catalysing *FARMS* groups - including, Ghana, Nigeria, Kenya, Uganda, Tanzania, Zambia, Zimbabwe and Sierra Leone (Wibberley, 2004).

### A Southern Nigerian Case Study

Nigeria, as Africa's largest oil-producer and most populous nation has exerted some pressure to maintain rather more control over its own agricultural policies than some smaller WTO members have been able to muster. However, its 'food security crop' (Babaleye, 1996) cassava is now not only used as fuel to cook imported far Eastern Rice in some villages but also is apparently the focus of biofuel planning on quite a large scale. There is an obvious moral dilemma of generating large scale fuel for automobiles – as in Brazil and increasingly elsewhere - rather than food for the hungry from cassava (*Manihot utilissima*). Policy needs to be adjusted to accommodate this concern (Umeh & Asogwa, 2005). Meanwhile, small farmers continue to leave their farms (Oduyoye, 1973) but others, such as Dr Mike Oye of Oshogbo in Osun State, develop integral resource management strategies on their farms and disseminate them to

<sup>4</sup> Kanyama-Phiri, G. (2005) Taming Hunger: the answer is in the soil. 9<sup>th</sup> inaugural lecture, UNIMA, Malawi 58pp.

<sup>5</sup> Levy, S. – ed. (2005) *Starter Packs: a strategy to fight hunger in developing countries?* (CABI publishing, Wallingford, UK, 295 pp.)

<sup>6</sup> See Hirt, H-M & M'Pia, B. (2001) *Natural Medicine in the Tropics* (ANAMED, 158 pp.) www.anamed.org

<sup>7</sup> Clover, C. (2005) *The End of the Line: how overfishing is changing the world & what we eat.* (Ebury Press, London, UK, 314 pp.).

others (Fig.1). Nigerian farmers can conduct worthwhile on-farm experiments (McNamara & Morse, 1996).

Fig 1. ‘**CAMP AGGAMMAL**’ symbolises for RURCON Chairman Dr Mike Oye the integral use of readily available resources for sustainable tropical farming to stem hunger, as follows:-

*Crotalaria* (sunn hemp) a marvellous legume cover crop to alternate with cereals and other crops.  
 Ash - to add to compost, poultry feeds and use as protectant dip over planted yam segments  
*Moringa oleifera* - tree makes good live fence, leaf/pod vegetables, root powder spice, oil seeds  
*Pueraria* - cover crop which also gives good seed yield when grown on a supporting trellis  
*Acacia* - *A. albida* (*Faidherbia*) intercrop 100 legume trees/ha + maize/sorghum for <300 kgN/ha  
 Granite dust – nutrient source for compost and poultry rations  
*Gliricidia* - N-fixing ‘mother of cocoa’ tree; live fence, termite resistant, durable, fuel-wood tree  
*Azadirachta* - neem tree; multiple uses timber, fodder, de-wormer, insect-repellent pesticide  
 Mulch - crop residues to protect soil from moisture loss & to suppress weed establishment  
 Manure (FYM) - to replenish soil nutrients and to add to compost  
*Ageratum* - goatweed; natural pesticide and parasite-deterrent source  
*Leucaena* - valuable, fast-growing legume fodder, shade and fuel-wood tree; it coppices well.

### **Enterprise Management, Private Extension & Training : A Case Study from Ghana**

During the 1970s, Ghanaian farmer Tom Ahima worked in the north of the country promoting the use of draft oxen among farmers (Ahima & Ogborn, 1995). Since 1978, he has developed his own farm as the Ofuman Agricultural Project – for which he gained the first National Best Farmer Award in 1987, and many awards since. A key enterprise has been egg plants (aubergines, *Solanum melongena*). Ahima’s wife Agnes collected some aubergine seeds in northern Ghana and tried them at Ofuman in Brong Ahafo district in 1978. Since then, they have grown three crops per year, two largely rain-fed and one irrigated. They have shared their knowledge of egg plants with neighbouring farmers via voluntary private extension work and by now around 1000 small-scale farmers have formed their own independent co-operative to grow and market the egg plants to Kumasi and other towns. Not only is diet greatly improved in the dry season but so is farmers’ morale and confidence in their own management abilities. Ahima has also set up a network of some 250 out-growers of seed maize and contributed to the National Food Security programme through these strategic management arrangements. Primary cultivation work is shared among the members giving some of the smaller seed maize growers access to tractors at the strategic stage for early cultivations before the onset of the rains. Concerned by the lack of managerial confidence of agricultural graduates in Ghana which deters them from starting farming, Ahima has also set up a Graduate Farmer Training Scheme at Ofuman to mentor a new generation of farmers. The integration of enterprise, extension and training overcomes some of the constraints in managing agricultural extension described by Amalu (1998) and is a good example of the servant leadership advocated by another Ghanaian (Osei-Mensah, 1990).

### **Farm Livelihood Impacts of Improved Management : A Ugandan Case Study**

Uganda as a nation has adopted an enterprise culture during the past two decades, the first of which was reviewed by Museveni (1997). Uganda’s present population of around 26.7 million is projected to rise to some 93 million by 2050. Thus, sustainable natural resource management will be crucial in the context of Uganda’s currently strong agrarian structure of many small farms. Uganda faces the classic tension between the temptation to go for large-scale businesses for short term gain against the wisdom of maintaining as many farmers as sensibly possible. Better resource management at Farm-Household level

is the key both to the feasibility and to the desire of people to stay farming and caring for their rural landscapes.

Kinengyere-Mango & Wibberley (2006) reported their independent impact evaluation of Send-A-Cow Uganda work among 122 farmers in two farmers' associations - AWA in Masaka District and BMW in Iganga District. Adoption of improved **farming techniques** e.g. zero-grazing, collecting urine and manure, making compost, using natural pesticides, was over 75% for almost all new techniques, resulting in better yields of crops and vegetables. This led to improvements in **nutrition and health** of farm families. Impacts on **households** and **livelihoods** included key home improvements such as latrines and kitchens. Food storage losses have reduced greatly. Incorporation of improved animals, (cows or goats) into the farming system, combined with adoption of new farming techniques, has resulted in some increase in the ability to save. The range of farm products for sale has improved. Many women reported feeling richer, and some reported buying better clothing or a bicycle.

**Learning together** has resulted in farmers adopting on average between 3 and 4 new farming techniques, and 65% to 85% of farmers now find it easier to share and learn from other farmers. Farmers reported being very empowered, and nearly all said that they have started, or continue to pray about their farming. Most women and men are now working together better. Women have greatly increased their influence and feel their status is noticeably higher. Fuel-efficient stoves have been adopted by over 75% of farmers, and tree-planting has increased also protecting the **environment**. Over 75% of households hold responsibilities in **community** organisations demonstrating their capacity to get involved in civil society. Members of **farmer groups** value their groups very highly; the main impacts of membership are the ability to seek advice, to network, and to visit other farmers, thus improving their own Farm-Household management.

The **Kulika Uganda Trust** led by Elijah Kyamuwendo has promoted sustainable agriculture and encouraged farmers' study groups in Uganda. Hundreds of such groups have been formed by farmers, leading to various collaborative enterprises. Some Ugandan farmers are using often wasted crops – such as surplus mangoes and tomatoes - then exporting items such as solar-dried organic mangoes and tomatoes, thus significantly adding value to their produce.

### **Conserving & Building Local Food Chains In Africa: A Case Study in The Gambia**

Connecting and building Food Chains is critical: 'local food is miles better everywhere' (Lang & Heasman, 2004; Wibberley, 2004). The importance and common sense of seeking local produce is particularly obvious in the case of fresh fruit and vegetables, where there is currently considerable scope for improvement in the Food Chain linkages (van der Stichele, *et al*, 2006).

*Concern Universal*, a UK-based international NGO works in several countries, including The Gambia. Among its projects there is 'Gambia is Good' (GIG). The management abilities of Gambian farmers and the capacity of soils there to grow vegetables and fruits are recognised by GIG. However, farmers' management can beneficially respond to the reality of high dependence upon tourism within the Gambian economy (it forms the leading component within 'service industries' which account for some 52% of Gambia's GDP). This means that farmers require particular logistical and technical management strategies to provide the consistency of supply and of quality demanded by the hotel trade. At present, many vegetables and fruits are imported in bulk via Europe, at unsustainably high environmental and human cost. Substituting local produce requires new management skills. These are being shared in a pioneering partnership with fruit and vegetable farmers from the UK, led by Angus Davison of *Haygrove*, based in Herefordshire. Gambian farmers and hoteliers are responding with alacrity to the developing local food chain initiative and it is anticipated that this will also influence policy with other foods, including poultry products, and be extended to other consumers – such as those in the public sector in

government ministries, schools, hospitals and prisons. Adama Bah, who has led many initiatives in responsible tourism within Gambia, is actively involved in managing the development of GIG.

### Climate Change & African Agricultural Management

Global warming is perhaps the biggest challenge facing the world, and there is an imperative to treat the earth as an interdependent whole living system (Lovelock, 2006). Global temperatures will probably rise by between 1.1°C and 6.4°C by the year 2100. For Sierra Leone, for example, the rise will probably be 3.0-3.5°C. Rainfall belts are moving further northwards and southwards from regions like the Sahel and within southern Africa, making droughts more likely. *The Africa Commission* (2005 – Penguin, 184 pp.) proposed three main ‘pillars’ for action:- a) debt cancellation, b) action on global climate change and then, c) a trading ‘free-for-all’! This last point is unsustainable for farming and inimical to counteracting adverse climate change. Furthermore, land misuse – mainly deforestation – is estimated to account for some 18% of global greenhouse gas emissions (UK Report of Sir Nicholas Stern, December 2006). Mortimore and Manvell (2006) assert – based on an analysis of 105 UK DFID-funded Renewable Natural Resources Research Strategy projects - that climate change threatens the livelihoods of many poor people. Helping poor people to adapt (through research on adaptive crop cultivars, appropriate technologies, strategies and institutions) is imperative, they argue. The Kyoto protocols of 1997 provide an international management framework to guide practical responses towards mitigating negative effects of climate change, to which Africa is also required to respond (Ogunseitan, 2003). International agriculturally-related management is vital.

### Discussion & Conclusions

**Globalisation** impacts the sustainability of African agriculture in both positive and negative ways. A positive arises from the fact that Africa leads the world in growth of mobile telephone ownership in view of the general shortage of land-lines. The use of mobile telephones in farm produce marketing can be strategic in several ways. Firstly, in accessing countrywide market prices to reduce inappropriate, distorting differentials. Secondly, in conjunction with account *Switch* cards, in enabling credit to be accrued into bank accounts without the use of cash. This allows women to receive money directly and use it for the benefit of their children whereas some men may waste it on excessive alcohol. Negatives arise from the fact that there is international upheaval of labour, capital and produce of the land in relatively unregulated movements, coupled with farmer losses on an unprecedented scale. NEPAD (the New Partnership for African Development) offers various opportunities to promote progress (Evbuomwan, 2004).

**Trading:** The WTO (World Trade Organisation) policy encourages non-discrimination against imports with consequent unregulated movement of agricultural staple products to countries where they can perfectly well grow locally. This has negative impacts in Africa and raises questions of ethics and equity in itself, as well as through the commoditisation of agricultural products. For example, when any crop or animal product is reduced to the status of a commodity, least cost methods of producing it can be more easily legitimised in common thinking. This can lead to compromising soil conservation, jeopardising animal welfare, improper workforce treatment and damaging the environment through excessive movement of goods and people – harming both the origin and the destination of such produce in various ways. Some sort of *Highway Code* framework for agricultural trading is imperative to set boundaries regulating the excessive movement, especially of staple foods (Wibberley, 2005).

**Agrarian advocacy for sub-Saharan Africa**, as proposed by Gwaivangmin & Wibberley (2004) involves arguing the *integral* case for:-

- sustainable farm livelihoods

- natural resource conservation and management
- food security, and
- land heritage (the recognition, celebration and care of ‘entrusted place’).

From policy-makers to grass-roots farming communities, such advocacy is needed. There are links between agrarian advocacy and:-

- environmental protection
- community and individual health
- reconciliation and the avoidance of conflict, including resource-wars
- national security in an increasingly volatile world.

The delivery of a sustainable system of agriculture in sub-Saharan Africa requires the simultaneous implementation of the following:-

- Farmers in place, conserved and respected as **professional managers** with means to retain them and to value their **multiprofessionality**, including respecting part-time farming;
- **Good Agricultural & Environmental Management Practice** – sound husbandry, as it used to be called - for biodiversity, equity and long-term environmental care;
- Trading **Highway Code** protocols in place to provide a **management framework** within which viable livelihoods can be sustainably pursued internationally for food security (Wibberley, 2005);
- Mobilising Civil Society consumers to value local food and their own food cultures more such that they support food sovereignty in principle and by their purchasing practice. This requires better **management of public relations** by farmers to persuade consumers of its importance.

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