

## **CARBON CREDIT CHALLENGES & OPPORTUNITIES FOR AFRICAN FARMERS**

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### **ABSTRACT**

Of the over 850 Clean Development Mechanism (CDM) projects registered in the world only 27 are in Africa. Like the Continent, CA proponents need to find ways and means of lessening their dependence on outsiders and becoming increasingly self-reliant. Carbon credits or offsets could be utilised as an additional inducement to encourage farmers adopt CA and, if their identification, quantification and monitoring were undertaken by CA advocacy or practitioner groups, the service charges which would normally accrue to outsiders could be utilised to further promote CA adoption. An opportunity exists for African Conservation Agriculture farmers to exploit the Carbon trading market, but to do so they need to work in concert with one another and use some of the moneys generated to set up technical advisory and lobbying services. If programmes were developed which also included reward for good stewardship of the land (for example by reducing erosion), and other public services (such as decreased siltation of dams and cost of water purification), a package could be devised which would not only increase the adoption of CA but be of real interest to farmers, governments and, to provide start-up funding, donors.

### **INTRODUCTION**

As we enter the 21<sup>st</sup> Century African farmers, in the main, are conservative and confused.

Conservative because that's what farmers are, especially those whose actions or lack of may result in the life or death of their loved ones or themselves.

Confused because they are torn between the tried and proven practices of their forefathers and the weird and wonderful (and often conflicting) advice of the educated, their sons and daughters, who 'really should know' as they have been exposed to both the ways of their ancestors as well as international learnings.

Unfortunately an equation initiated in many instances by the colonialists, whose basic if not always conscious objective was to subvert the indigenous people from being nett producers to nett consumers, farmers who would produce sufficient raw materials to provide feedstock for urban or overseas industries and use the money generated from these to purchase goods from other industries. That this 'urban conspiracy' could result in the degradation and/or devastation of natural resources was of little concern as, as is the wont of politicians everywhere, when

disaster loomed they (in this instance the colonialists) could simply withdraw and leave their successors (often the freedom fighters) to reap the wrath.

And so we have Africa, a continent in many regions teetering on the brink of disaster, with many of its leaders solely concerned with their own aggrandisement and enrichment, its public servants self-seeking and corrupt, its citizens, debilitated and decimated by HIV/AIDS, fighting seemingly never-ending wars whose principal result is to keep overseas munitions manufacturers in business, and the vast majority of its farmers, together with the rest of their nation, subsisting, directly or indirectly, on Aid.

Farmers who, despite their extreme poverty, continue too often to be exhorted to cultivate the soil using imported machinery and fossil fuels instead of livestock and grass; fertilise their crops using other-continent nutrients instead of natural processes; 'control' pests and diseases using imported agro-chemicals instead of managing them with the natural products or cropping systems known to their predecessors but in danger of being forgotten. Captives of a feudal system, where expansion is all but impossible and 'love for one's neighbours' an inescapable inevitable debilitating necessity. An aging derided segment of the population, with their sons and daughters drawn to the cities by sophisticated advertising, 'bright lights' and an aversion to the plight of their parents, urban sprawls where unemployment is rife and crime often the only way to survive.

Farmers whose attempts to follow the often ill-considered advice of the so-called learned ones have resulted in megatonnes of top soil polluting and silting up the continent's rivers and oceans (some 25% of South Africa's topsoil was lost in the 20<sup>th</sup> Century), soil life being decimated by the plough, soil systems being halted or corrupted and tonnes of Carbon being released annually into the atmosphere by burning or mechanical cultivation. Farmers, many of whom won't have to contend with the effects of climate change due to all their soil having been washed or blown away, while others, as some predict, will plough up natural ecosystems to such an extent that their transformation will become the biggest contributor to global warming in, for example, East Africa (Yanda, 2008).

But all is not doom and gloom. Conservation Agriculture (CA) provides a real opportunity to agriculturists wishing to diminish and even possibly reverse the effects of climate change. Crop rotation and multi-cropping can be used to lessen dependence on imported nutrients such as Nitrogen and Phosphorus, to break pest and disease cycles and engender healthier soil and atmospheric micro-climates; mulches reduce soil temperature fluxes, capture rainfall and retain soil moisture; decreased soil disturbance allows soil systems and organisms to regenerate and stabilise, reduces carbon losses and enhances sequestration; and the reduced time and effort required of the farmer increases the time available for management and opportunities for value-adding, so reducing dependence on urban processed goods and enabling those weakened by malnutrition or disease to engage more fully in economically productive and more satisfying life-styles.

The problem is that farmers have been so subordinated and indoctrinated that the practices of their forefathers are 'old fashioned', that they should only do as 'teacher tells' and that only bright and shiny and sophisticated equipment and techniques have a place in this modern world,

that they are often reluctant to even try CA, let alone adopt it at the scale and rate necessary to save the Continent. Unfortunately too the common-sense, experiential and reduced-input approach advocated by CA proponents is often in direct conflict with the learned academics and commercial manufacturers and sales people of our time, who often see CA as an affront to their teachings or dignity or an assault on their profit margins, and as a result often not only refuse to back CA programmes but actively oppose them.

Like the Continent, therefore, CA proponents need to find ways and means of lessening their dependence on outsiders and becoming increasingly self-reliant. Carbon credits or offsets could be utilised as an additional inducement to encourage farmers adopt CA and, if their identification, quantification and monitoring were undertaken by CA advocacy or practitioner groups, the service charges which would normally accrue to outsiders could be utilised to further promote CA adoption.

The objective of this paper, therefore, is to briefly examine the feasibility of identifying, quantifying and monitoring ways of assessing Carbon credits generated by different groups of crop producers in Africa and suggest ways in which these could be used to both benefit the farmers who generate them and assist promote the adoption of CA in Africa.

## **AFRICAN FARMER TYPOLOGIES**

Including as they do the most primitive hunter-gatherers and exponents of slash-and-burn as well as some of the most sophisticated utilisers of enviro-controlled tunnels and fertigation, the farmers of Africa are an extremely heterogeneous group.

African farmers can be grouped according to farm usage, for example rainfed crop-only, irrigated crop-only, mixed rainfed (crop and livestock), mixed irrigated, and livestock-only (Seo, Mendelsohn, Dinar, Kurukulasuriya & Hassan, 2008). Each of these groups can in turn be subdivided into sub-subsistence, subsistence, emerging and commercial, with the vast majority falling into the mixed rainfed sub-subsistence, subsistence and emerging farmer typologies. Of these, the rainfed and irrigated predominantly emerging or commercial farmers are the main influencers of Carbon flux in the African agricultural sector. Livestock farmers are also responsible for Carbon emissions, but the dietary methods of reducing these will not be considered here.

When considering the sequestering of Carbon by crop farmers in Africa, therefore, the following typologies should be considered, and these may be broadly defined as follows:

a. Sub-subsistence farmers: Those who live in the rural areas but depend on outside sources, often employment but sometimes food etc. aid, for survival. While frequently occupying or having the right to occupy the same amount of land per family unit as other small scale farmers, those in traditionally governed areas will often not allow others to utilise their land for fear that the traditional authority or chief may conclude they do not need the land and give it to someone else.

b. Subsistence farmers: Those who produce sufficient (predominantly food) on their holdings to satisfy family needs. Frequently those in traditional areas who would expand their cropped area are prevented from doing so by the reservations of their peers, and the need to accommodate the needs of succeeding generations results in holdings decreasing rather than increasing in size, thereby becoming progressively more uneconomic to farm.

c. Emerging farmers: These may include women or men who were formerly subsistence farmers but who, through individual acumen or entrepreneurship, have either

i. increased their income from their traditional holding by astute use of their time and energies to increase their income by, for example, value adding and/or the adoption of Conservation Agriculture;

ii. taken up full- or part-time employment and are investing the resultant income in their farming activities; or

iii. moved onto another larger farm.

Whereas subsistence and semi-subsistence farmers tend to be older members of local communities, emerging farmers tend to be younger and more entrepreneurial in their approach.

d. Commercial farmers: These tend to be more established agricultural entrepreneurs with larger enterprises than the above.

## CHALLENGES

Due in the main to the restrictions of the Kyoto Protocol, trading in Carbon credits generated in Africa has to date been almost solely related to forestry. Real possibilities exist, however, for the exploitation of other C emission reduction systems, including, for example, reducing livestock flatulence, controlling wildfires, improving soil cover and increasing C sequestration using Conservation Agriculture.

The primary challenge faced by especially sub-subsistence and subsistence crop producers wishing to benefit from Carbon offsets is the cost of measurement and verification of the change in Carbon emissions. For the larger scale commercial farmers this, especially when a group of neighbouring farms is involved, can be reasonably cost-effective, but for small scale farmers area- or situation-specific methods need to be devised. ICRAF, in association with the Earth Institute at Columbia University and Michigan State University, using satellite imagery and infrared spectroscopy, are reported to have developed a method using satellite data, field surveys and laboratory analyses which is said to be highly accurate and cost effective, and could provide a solution to this problem.

However the amount of money a small scale farmer would receive from the Carbon s/he sequestered per year would in most instances be minute, especially if only the area (often less than 1 hectare) cropped by the farmer was taken into account. This could be increased, however, if the C emissions from wildfires was included, and farmers rewarded for decreasing these - currently giving rise to major atmospheric pollution in the dry season in many areas.

Another method of reducing the cost of identification, validation and monitoring would be to consolidate the cropped areas. At present each farmer does as s/he pleases but, as the urban drift continues and aging farming populations die, more and more land will lie fallow, something the continent can ill afford if it is to provide food and employment to its burgeoning population. Encouraging groups of farmers to consolidate their holdings and place them under one management could result in increased yields (despite global warming, as current yields are often less than 10% of the potential), more effective crop rotations and larger inspection areas.

Many researchers maintain that more research is required to be able to quantify changes in Carbon flux, but Belder, Twomlow & Hove, 2007, found an albeit small increase in soil C following CA. Traders have stated that the difference is so slight, especially in drier areas, that it will never justify the measurement and/or monitoring involved. These opinions have to be taken into account but, for example, utilisation of high lignin species and species with a high below-:above-ground plant component ratio could significantly increase Carbon sequestered..

Another real problem is determining what action to take when a farmer decides to cultivate, and/or how to deter a farmer from doing so. In addition, soils in the semi-arid regions are likely to reach the situation where they cease to sequester Carbon much sooner than those in more humid areas.

## **OPPORTUNITIES**

Opportunities for Carbon trading in Africa would therefore appear to depend on the degree of formalisation to be targeted.

The formal or ‘compliance’ Carbon market, especially as it is at present, would appear to be inappropriate for most CA farmer offset trading. Informal trading (or the ‘voluntary’ market), however, such as on the CCX, is certainly attainable, but possibly the most realistic in the short term is the exploitation of ‘Triple Bottom Line Accounting’, where companies are increasingly being called upon by their shareholders to demonstrate their environmental responsibility, both by being ‘enviro-friendly’, or at least ‘enviro-sensitive’, in their practices as well as by supporting organisations trying to create a better world

Of particular interest is the possibility of establishing regional or national CA Associations and developing capacities within these to establish, validate and monitor Carbon flux. In this way farmers could be paid out and the associations use the moneys which would normally accrue to a trader to become self-supporting **and** provide the advisory and lobbying capacity so sorely lacking in Africa at present which, in turn, will increase the amount of Carbon sequestered, make the operation more cost-effective, and generate more money for the initiators.

## **CONCLUSION**

Of the over 850 CDM projects registered in the world only 27 were in Africa. A real opportunity therefore exists for African Conservation Agriculture farmers to develop this market, but to do so they need to work in concert with one another and use some of the moneys generated to set up a technical advisory facility and a lobbying group. . If programmes were developed which also included reward for good stewardship of the land (for example by reducing erosion), and other services to the public good (such as decreased siltation of dams and cost of water purification), a package could be devised which would not only increase the adoption of CA but be of real interest to farmers, governments and, to get them started, donors.

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