There are literally dozens of postgraduate programmes in economics in the UK but, to my knowledge, ours is the only one that has a study tour as a compulsory component. To some extent, this is an historical anomaly: various programmes within what used to be called the Institute of Ecology and Resource Management at Edinburgh University ran such study tours, and it seemed appropriate for Ecological Economics to do so as well. Over the course of time, many sister MSc programmes in the School of GeoSciences have opted to drop the study tour element but we have retained ours.

Although organising such a study tour can be a logistical nightmare, particularly if we are travelling to a developing country with relatively poor infrastructure, the rewards are enormous both in terms of academic content and the group dynamics in the MSc cohort. I think that it is critically important that we see first-hand both the socio-economic conflicts that lead to resource degradation and also the policy interventions that have been applied to address these conflicts. This is the ethos of the study tour.

We have in previous years had very successful study tours in Wales, Greece and Morocco. For the 2006-7 academic year, I decided to return to Kenya for the fifth time with the student cohort and this proved to be a highly successful trip. I hope that what follows both in writing and through pictures provides a flavour of what the study tour is about. Further, I try to draw out some of the links between the EE theory that we learn in the taught component of the Masters and the applications that we saw on the ground in Kenya.

I must add an important caveat here: there is no guarantee whatsoever that we can repeat this Kenya trip in subsequent years owing to a variety of constraints - financial, logistic and/or health and safety. We will have a study tour - but it may be within the UK as it has been in previous years.

The rest of this document is split into three sections: the Maasai Mara; Lake Nakuru National Park; Lake Naivasha. In each case, I focus on the critical issues and attempts at conflict resolution.

Group shot in Lake Nakuru (minus Cecilia who is taking the picture)

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The Maasai Mara National Reserve

General Background

The Maasai Mara National Reserve (MMNR) forms the Kenyan side of the Serengeti Mara ecosystem that extends across the border to Tanzania. MMNR is distinct from Lake Nakuru and other National *Parks* (as opposed to Reserves) in Kenya as Parks are managed by the Kenya Wildlife Service (KWS) whereas MMNR has local autonomy in management. Part of the reason to come to the Mara was to witness the different management systems across the Mara and its implications for wildlife conservation and local livelihoods, in particular those of the Maasai.

The 'Maasai Mara' is actually *only* the MMNR. However, many trips to what is loosely called by tourist agencies the Maasai Mara are actually not in the MMNR. The surrounding areas constitute 'the Mara', but the MMNR differs in that there is no livestock production/husbandry in the MMNR itself - the Maasai are excluded, which is a point that we explore in this element of the study tour. The Mara is named after the Mara river; the annual migration from the Serengeti to the Mara (across the river) attracts many tourists.

The Serengeti Mara ecosystem was conceived in 1948 under the rule of the British Rag when the Serengeti National Park was designated a protected area. In 1961 the colonial government gazetted part of the Mara west of the River for game shooting. In the early 1970s, Kenya Game Reserves and Kenya National Park were merged into the MMNR. From 1963 (Kenyan independence) to the current day MMNR has been administered by Narok County Council. The current area of the MMGR is approximately 1510 square km.

The main EE academic issues that we explored in this segment of the study tour were as follows:

1. Conservation management and administration
2. Maasai communities and incentives for conservation

Random 'giraffes in the Mara' picture (one of literally hundreds of such pictures taken by the students!)

Issue 1 Conservation management and administration

The MMNR contains a diversity of wildlife but conservation depends not only on actions taken within the Reserve but also outside it. Wildlife moves freely from MMNR itself to adjoining areas including of course the Serengeti that is in a different country. There are thus a series of trans-boundary issues that we explore.

In the discussion of non-market valuation methods in the Applications in EE core course, the concept of Total Economic Value is introduced. The principle here is that the total value of the wildlife is the sum of various composite parts. These include direct use values (e.g. tourism) and non-use values such as simply knowing that the wildlife will be preserved for future generations (bequest value). A key outcome of this discussion is that if these values are not passed on in some manner to those responsible for conservation then there will not be as much conservation as is 'economically optimal'. Basically, there have to be incentives and resources in place for those involved in conservation work to operate.

What we see in the Mara is a situation where this applies to varying degrees depending on the management and administrative systems in operation.

For the entire (wider) Mara, park entry fees are set by Narok County Council. However, it is only in MMNR itself that monies accrued go directly to the Council. These revenues account for around 90-95% of total revenues. The County Council has many departments - including the game department - that make calls on this revenue. Of course, in terms of overall sustainability it is appropriate that these revenues fund other public services (schools, roads, hospitals, etc). There is little economic incentive for there to be funding for improvements in the infrastructure associated with tourism as those spending this money from their budgets (the game department) then see 90-95% of revenues being re-distributed to other Council activities. This outcome, i.e. a poorly maintained road infrastructure in the MMNR as compared with other regions in the Mara that have different management regimes, was visible as we went on the tour.

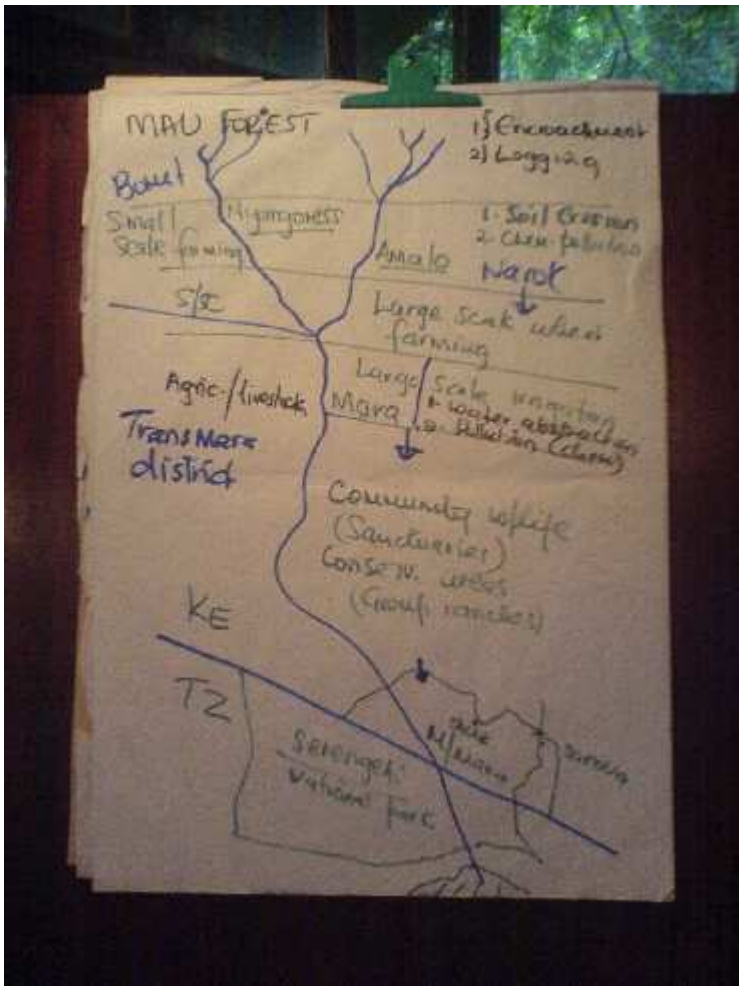
Koros from WWF describing some of the intra-Kenyan conflicts between TransMara County Council and MMNR and international property rights issues at the Mara River, close to the Tanzanian border

Pre-1989, the Council withheld and used all these revenues but post-1989 agreed to pass 19% of income to communities adjoining the Reserve. Predators such as lions have a range outside the MMNR and thus inflict damage and death to livestock and humans. There is now a compensation scheme in place, but the compensation levels remain small. Again, those

adversely affected by conservation are not compensated for their actions, i.e. an economically inefficient and ethically unsatisfactory outcome.

In 2000, one part of the MMNR was handed over (with respect to management of fee collection and infrastructure) to a newly formed private-NGO, Mara Conservancy. Their web site (http://www.maraconservancy.com/) documents some of the issues that they had to contend with.

What we see in the Mara is an application of different institutional frameworks to manage the tourist income and thus to facilitate conservation.



Koros from WWF constructed this annotated map of the Mara region showing the property rights delineation and some of the ecological issues, presented at a workshop with the MSc group in Mara

During the trip we also met with a Maasai chief who, along with our host from ILRI (Dixon) had set up more community-based 'group ranches'. The first group ranch was the one at Keyaki/Lemek, set up in 1995, and this became a model for others. There is a commitment to employ local people, to distribute the benefits of tourism among the community and to provide an incentive for conservation. We saw evidence of this working.

Issue 2 Maasai communities and incentives for conservation

We visited a Maasai boma (dwelling) just adjacent to the MMNR to talk to the community. We found that the official 19% redistribution to communities adjoining the Reserve had never filtered through to them - there were school-building and other infrastructure projects that they were aware of, but local politicians held the purse strings.

Discussion with a Maasai community took place in traditional Maasai style – seated under a tree – and was hosted by Dixon from ILRI who has worked with such disenfranchised communities for many years.

They pointed to the fact that when the Maasai had agreed to hand over their land to the Kenyan government they had done so under very different conditions to those that apply today. At the time, the land in the current MMNR was relatively unproductive and also there were raids from other tribes from Tanzania and the theft of livestock. Now the increase in Maasai populations has meant that there are binding constraints on their activities, affecting their way of life.

If they were caught grazing their cattle within the MMNR during the dry season - a time of great need and often of crisis - they were imprisoned and heavily fined. They found this to be unfair. They received virtually no benefit from the tourism activity whatsoever. Indeed, the only revenue they receive (aside from selling souvenirs) was visits to the cultural boma. But they described how typically they would only be given around $5 by the tourist drivers for entertaining one entire van full of tourists whilst the drivers themselves charge $10 per head.

The most striking part of this question-answer session was perhaps when one of the Maasai asked us why we were asking these questions about how the Reserve affects them - why were we interested? They noted that no tourist had ever stopped to ask them about what they got out of the Reserve. This was somewhat depressing to hear, more so as simply engaging with them raised their expectations. My response as Programme Director was that we genuinely wished to learn from them and to understand the constraints that affected their livelihoods

Wildlife are not scared of the Maasai as (in the main) they do not eat bush meat. Their communities are sympathetic to and an integral part of the ecosystem. But many (most) tourists do not recognise that tourism in the 'Maasai Mara' leads to only minimal rewards to the Maasai themselves.

Shot of the MSc group with a Maasai Community that lives just outside the MMNR.

Lake Nakuru National Park

General Background

Lake Nakuru is a very shallow strongly alkaline lake of approximately 62 km^2 in extent, located in Central Kenya in the Nakuru District of the Rift Valley Province. It is set in a picturesque landscape of surrounding woodland and grassland next to Nakuru town. The landscape includes areas of marsh and grasslands alternating with rocky cliffs and outcrops, stretches of acacia woodland and rocky hillsides covered with a Euphorbia forest on the eastern perimeter.

The lake catchment is bounded by Menengai crater to the north, the Bahati hills to the north-east, the lion hill ranges to the east, Eburu crater to the south and the Mau escarpment to the west. Three major rivers, the Njoro, Makalia and Enderit drain into the lake, together with water from the town's sewage works and the outflow from several springs along the shore.

Lake Nakuru was first gazetted as a bird sanctuary in 1960 and upgraded to National Park status in 1968. A northern extension was added to the park in 1974 and the Lake was designated as a Ramsar site in 1990. The foundation of the parks food chains is the *cyanophyte spirulina platensis* which can potentially support huge numbers of lesser flamingo.

Koros from WWF talking to the group about issues in the Lake Nakuru river basin

Discussions ranged from ecosystem impacts of pollution on the pink flamingos, the environmental chemistry of the Lake, the effects of deforestation, and how he and other WWF colleagues dealt with being stranded in a capsized boat in hippo-infested waters!

Socio-economic and developmental constraints

The national park is 'A-listed' by the Kenya Wildlife Service (KWS) and generates a lot of tourist revenue. KWS is a department of the national Kenyan government and so park fees contribute to the national exchequer. Although this does not benefit local communities directly, the need for foreign currency accumulation is a pressing one for any developing country. Further, the residents of Nakuru town do benefit to a limited extent from the national park in terms of local employment/income generation from the provision of tourism services.

However, there are many inhabitants of Nakuru town - with a population of *circa* 1 million - that see no direct benefit from the national park designation. Lake Nakuru is an ideal study site for ecological economics in that we can witness the direct and immediate consequences of resource degradation/environmental pollution: the flamingos fly to the (much less visited) national park at Lake Begoria if the water quality in Lake Nakuru deteriorates. This is turn is affected by a host of socio-economic activities linked in turn to institutional structures, corruption and incentives for the poor to choose resource degrading activities instead of those that might contribute to wildlife preservation.

In economic terms, what we witness is externalities, a type of market failure discussed throughout the taught component of the MSc. These externalities are exacerbated by various institutional frameworks. Daniel Koros from WWF Nakuru discussed three key issues that pertain to the area and the interventions that WWF have tried, with varying degrees of success. These issues are:

1. deforestation in the Mau forest
2. siltation
3. waste management in Nakuru town

Issue 1 Deforestation in the Mau forest

Until the late 1960s, the land surrounding the Lake Nakuru catchment was in the main used for large scale farms, operated by settlers. The farm owners applied soil conservation rules to reduce soil erosion and siltation simply because there was an economic incentive to do so - such good practice increased profitability and the farmers could see and realise the direct private benefits of their actions. After these large scale farms were sub-divided in the late 1960s, owing to post-colonial land reallocation, deforestation rates rose markedly as land was cleared for agricultural production. In 1994, much of the Mau forest was gazetted and subsequently clear-felled. Koros told the group that this land reallocation was often allocated as political favours by local politicians with the connivance of the Forestry Department.

Deforestation in the Mau Forest: secondary vegetation in the background

Over the last three decades, WWF Nakuru has tried different forms of intervention to address the issue of deforestation in the Mau Forest. We witnessed evidence of deforestation on the drive to and from Lake Nakuru and discussed these issues at length with Koros from WWF Nakuru.

Further, our meeting with the Chief Warden of Lake Nakuru National Park was instructive in this regard. KWS have recently (in 2007) decided to set up outposts in the Mau Forest to look out for illegal logging activities. This is the kind of 'joined up thinking' that seems to have been absent for far too long from Kenyan politics. KWS recognise that the revenue generated from the National Park depends crucially on extra-Park (as well as intra-Park) monitoring and enforcement.

WWF Intervention 1 *Promotion of on-farm agro-forestry*

The main task here was and remains awareness-raising and sensitisation. Small scale farmers could not foresee that the rivers might stop flowing owing to deforestation and there was no history of soil management practices among them, unlike the colonial farmers that proceeded them. WWF explained which trees were best suited to agro-forestry such as silk oak and whispering pine. The planting of these species also had direct beneficial impacts on the farmer in that they are fast growing and can grow on rocky soils. Further, the penetration

of their root systems actually increases the productivity of maize for instance. This WWF policy was thus fairly successful.

Agro-forestry project in the Mau: small scale farming in the foreground and fuelwood for charcoal in the background

WWF Intervention 2 *Demonstration farms*

Koros pointed to the fact that circa 80% of farms are sub-let. Many of those individuals who were given title to land already had plots elsewhere. The problems associated with tenant farming and absentee farmers with regards deforestation arise from the lack of stability in land tenure that is implied. Many of these plots were handed over to poorer relatives/contacts. These tenants have no right of tenure - they can be evicted from the land at a moment's notice.

In the core courses on the EE programme, we present theoretical reasons why resource over-exploitation often occurs as a result of poorly defined and/or conceived property rights - this is discussed with reference to the bio-economics of fisheries. What we witnesses in Kenya is the same issue. In the same way that a fisherman in an 'open access' fishery has no incentive to harvest sustainably, so a Kenyan tenant farmer has little incentive to take a long-term perspective on crop productivity through soil conservation measures like agro-forestry.

Another EE theoretical concept that can be applied to this situation is discounting, i.e. placing a higher value on benefits/costs in the near future as compared with those that arise in the more distant future. There is evidence poorer farmers the world over apply a very high discount rate - higher than that level that is socially optimal - as they are hand-to-mouth. There might then be some economic justification for intervention.

This particular WWF initiative thus failed - as the EE theories in property rights would predict. WWF did choose to target the other 20% of farms when they witnessed a slow take-up, but his proved insufficient in terms of creating critical mass.

WWF Intervention 3 *Tree nurseries*

WWF recognised that one of the obstacles to poorer farmers applying agro-forestry at the small scale was the availability of seeds. These are sold in large quantities, and many farmers cannot afford to buy such quantities. WWF set up a scheme to distribute seeds in small quantities to encourage uptake.

Koros described two types of tree nursery schemes - one that worked (private small-scale nurseries) and the other that failed (community-based nurseries).

The community-based nurseries were operated and managed by local women. WWF provided them with farm tools, fencing, and a nursery manager. However, this proved to be commercially non-viable with the efforts expended over a year being large as compared with the sales revenues. The local women were very discouraged but WWF then initiated a programme to construct small water tanks to deal with water scarcity in the dry season. The failure of the communal nurseries was more likely not due to community management per se, but more the commercial viability of growing seedlings in the market context of 80% tenant farming.

Private small-scale nurseries did succeed. WWF encouraged farmers to plant seeds at household level - say planting 250 seedlings near the family home, and simply watering them from the waste water from cleaning/domestic activities. This worked as, once the trees had grown for a year, there was a private incentive to care for them.

Again, in EE terms the issue is one of providing the right incentives to private agents and understanding market conditions, the latter being perhaps under-explored in the case of the nursery cooperatives.

Issue 2 Siltation

Siltation has a significant effect on the wildlife in Lake Nakuru National Park. It affects basic water quality parameters and can create algal blooms that in turn decrease flamingo counts and this has an impact on tourist revenues. Siltation also impacts on the Lake with respect to the transfer of fertiliser and pesticide residues. As for most ecological issues, WWF applied a multi-pronged approach: education; conservation; monitoring; and planning.

WWF Intervention *Soil conservation*

As mentioned above, the colonial settlers applied sound soil conservation practices simply to maximise profitability - to replay the British government for debts incurred in constructing the Kenyan railway network. The large scale farmers enjoyed the *private* benefits from soil conservation. The small scale (mostly tenant) farmers did not have this history of soil conservation.

The EE theories of eco-innovation adoption presented in the second semester core course are highly relevant here. Conventional (neo-classical) economic theory supposes that well-informed, rational agents will go about their business so as to maximise their utility/profitability in the case of single-agent firms/farms. But theories from evolutionary economics suggest that the 'history' of innovations matter. It is not all about potential profits, but what the firm has done in the past.

In the Kenyan context, there were (and are) some more progressive farmers whilst others are laggards. WWF tried (relatively successfully) to latch onto the more progressive sub-section of the farmer population and encourage anti-siltation measures that would privately benefit the farmer. These measures were not coined as 'socially beneficial in that they conserve wildlife' - the private benefits to the farmer were highlighted. Again, in economic terms it is all about appropriate incentives for actions and understanding the population of farmers. So such measures as trenching, planting napier grass (which was still good in the dry season) and planting trees along terraces was supported by WWF Nakuru.

Farmers could see direct benefits and this is critical. The napier grass for instance increased milk productivity but also as a beneficial side-effect reduced siltation.

The rate of uptake was improved after the El Nino in 1999/2000. Farmers then saw their productivity decline dramatically over this period and then recognised the private benefits of combating siltation. The El Nino had a particularly brutal impact in this region as the Mau Forest was almost completely deforestated by 1999.

Issue 3 Waste management

We travelled around the industrial and residential areas of Nakuru town - off the beaten (tourist) trail. Nakuru has a fairly significant industrial base and has a population of circa 1 million inhabitants. In particular, there are major sources of heavy metals that seep into the Lake. An EverReady battery manufacture plant and a seed production plant are located in Nakuru. These heavy metals are stored in the fat reserves and were responsible for significant and dramatic declines in flamingo numbers in the late 1990s. Further, the drainage system is less than adequate - in the rainy season, industrial waste and effluent drain straight into the Lake.

Residential waste often accumulates and often gets washed up on the fringes of the National Park, a problem that is again worse during the rainy season.

WWF Intervention 1 *Industrial waste management*

WWF has encouraged local industries to join a Pollution Release and Transfer Register. This scheme, modelled on the Dutch system, is a mechanism for input-output analysis wherein the resource inputs and pollution emissions should be all accounted for. Any losses in the system may well be losses in terms of productivity, and so there is an incentive for firms to respond. In essence, the sum of the raw materials should equal the raw materials embodied in the final products and by-products - all else is waste.

This links with the economic theories of corporate social responsibility and environmental reporting that are discussed in the second core course in semester 2 of the Programme. What we witnessed in Kenya is the potential for what are termed 'win-win' outcomes wherein profits go up and environmental impacts go down. Again, neo-classical economics supposes that there is little scope for such win-wins in a well-functioning market, but we saw some evidence of their existence.

WWF Intervention 2 *Household waste management*

The household waste dumping site, populated by poor people scavenging for saleable material

Narok County Council is very over-stretched in terms of resources and finances. They have a number of household waste collection lorries but many are broken and the funds are not available for their upkeep. This leads to waste being dumped on communal streets in some areas, much of which ends up in Lake Nakuru.

What we also see is another very interesting application of property rights and management theories from EE.

In the 1990s, a group of unemployed students decided to purchase a very old truck and set up a firm that would collect waste privately. For a modest fee, household waste was collected from fee-paying streets. Residents on these streets decided to stop paying Narok County Council for waste collection as they were not in fact providing this service, re-attributing the monies to the private firm. We saw streets that were still being managed by the Council and compared them to the privately-managed alternative: the latter were much cleaner.

Household waste and debris disposed of directly onto the street. Such waste often ends up in the National Park after heavy rains

Since some poorer communities cannot afford such private garbage collection, WWF paid to have sealed and lockable chambers for household waste built. The municipality now comes to collect waste directly from these stores. Evidence of waste collection and debris was lower in these streets than those without this simple innovation, but still significantly higher than the private alternative.

The KSW Lake Nakuru Head Warden also told the group that KWS has paid for the waste treatment facilities to be repaired: again, this is evidence of 'joined up thinking', with the recognition that 70% of wildlife live outside the National Parks and that those within the confines of the Parks are subject to ecosystem changes brought about by human activities outside the Park.

Lake Naivasha

General Background

Lake Naivasha is a fairly large (139 km^2) freshwater lake which forms part of the Great Rift Valley. Its name derives from the local Maasai *Nai'posha*, meaning 'rough water' because of the sudden storms that can arise. The lake has an average depth of 6m, rising to 30m in some areas. Over 400 bird species have been spotted at the Lake and it has a sizable population of hippos.

The reason why Lake Naivasha is particularly interesting in EE terms is *not* wildlife conservation and associated threats from human development, although these are still important: what we focus on is the conflict between water abstraction/pollution emissions and local employment. In essence, we are asking whether local industrial production systems are sustainable and looking at the tradeoff between ecosystem degradation and human socio-economic development.

The water resource provides a critical resource input to production and waste assimilation function for several industries: the principle one that we explore is the highly dominant flower farming sector. There are various conflicts that arise amongst stakeholders: large scale and subsistence farmers; flower farmers; pastoralist Maasai groups; the tourist industry; the fishing sector etc. All depend to some extent on Lake Naivasha but the actions on one stakeholder often impinges on that of another.

What we are witness to in EE terms is the prevalence of externalities and associated inefficiencies, as well as (socio-ethical) issues of land rights and resource availability. The two main conflicts that we explore are as follows:

1. intra-farmer conflict
2. Maasai communities and their demands for right of access to Lake Naivasha versus large scale flower farmers and the Lake Naivasha Riparian Association

Watching a fish eagle swooping to catch its prey on Lake Naivasha

Conflict 1 Stakeholder conflict between farmers

A representative from WWF Bogoria was kind enough to talk to the group on this matter, assisted as ever by Daniel Koros from WWF Nakuru. The WWF East Africa Freshwater Programme has designated six river basins that it intends to conserve through the application of Integrated River Basin Management. Three are in Kenya (Mara; Malewa; Waseges). The Malewa drains into Lake Naivasha and the Waseges into Lake Bogoria.

One of the economically noteworthy features of the Lake Naivasha river catchment is the altitude gradient of the land surrounding the Lake - a drop from 2300m to 700m above sea level. Maize, beans and tomotoes - many for export - are grown at the higher altitudes, an area called Subukia. At low levels the predominant agricultural production systems are livestock-based: the area here is called Sandai. The Malewa starts in the hills near Lake Nakuru and then flows down.

The tomato producers in Subukia favour growing their produce in the dry season in order to minimise the need to apply (expensive) fertilisers, but this is turn implies fairly large-scale water abstraction from the Malewa. Smaller-scale farmers in Sandai have been contracted by Kenya Seed Company to produce seeds, but this requires water (as do their livestock) and this has led to hostilities which WWF Bogoria state has approached armed conflict at times.

In economic terms, it may or may not be the case that the highest value users of water are abstracting it - and if this is not the case then the situation is economically inefficient. Further, since there is no significant charging for water abstraction by the users in Subukia, there is little or no incentive for these water users to conserve the resource or to avoid wastage.

Small-scale fisherman working at Lake Naivasha. Many different productive (and non-productive) activities affect water quality in the Lake.

Conflict resolution *Water Resource Users Fora*

In order to attempt to resolve these conflicts, WWF established a series of discussion fora with relevant stakeholders. the aims of these fora are to set a baseline - to review the status quo, to raise awareness and to organise local communities and to give them a voice. Stakeholders are informed of historical trends in water use and availability and presented with expected changes in the future.

As a response to this, an objective framework matrix is established at each village administrative level - the Locational Environmental Planning Committee (LEPC). This matrix contains the following: an activity; who is responsible; resources available/required (labour, money, materials); and a timeline.

The LEPC feeds into the District Environment Committe (DEC) which in turn feeds into the sub-basin management committee (SBMC), one for the upper catchment and a second for the lower catchment. The SBMC comprises representatives from: LEPC; irrigation industry; swamp management committee; gender groups; youth groups; eco-tourism industry; horticulture industry; livestock sector; small-scale farmers; large-scale farmers. Within the SBMC there are sub-committees dealing with conflict resolution, environmental considerations and fundraising/awareness raising.

These two SBMCs together form the Water Resource Users Association which is legally recognised by the Kenyan government. This institutional process has been quite successful in dealing with many of the stakeholder conflicts that have arisen.

Conflict 2 Pastoralist groups and the large-scale flower producers

There is a conflict here that in some ways is typical of what EE is all about. Kenya is a developing country that suffers many of the characteristic problems of such economies, namely under-employment and instability in the livelihoods of many of its citizens. Coupled with these socio-economic concerns are ecological ones with resource degradation and over-exploitation.

EE is concerned with exploring the interface between economics, ethics and ecology - the application of sustainability principles: In Lake Naivasha, it is clear that there is a trade-off between these sub-elements of sustainability, and this is what we discuss during this element of the study tour.

Large scale flower producers have been locating their operations at Lake Naivasha since the early 1990s. In many respects, the location is ideal for flower farming:

- the climate is near-perfect, therein avoiding the need for expensive (and carbon-intensive) heated greenhouse facilities;
- the Lake provides a source of relatively clean freshwater for production;
- Naivasha is only a couple of hours drive from Nairobi and thus transport infrastructure is good - the flowers can be cut one day and be at the Amsterdam flower auctions the following day and indeed some of the larger farms have their own aircraft;
- labour supply is plentiful and cheap compared to European production;
- land is fairly cheap to purchase/lease and the Kenyan government ha encouraged flower production, therein removing some of the otherwise onerous and time-consuming associated bureacracy.

The flower production does create a large amount of employment for local Kenyans (although the majority of firms are foreign-owned). Further, there is strong evidence of good Corporate Social Responsibility: we drove past housing schemes, hospitals, and primary/secondary

schools funded by individual flower farms, and we discussed other cooperative projects coordinated by the Lake Naivasha Riparian Association (LNRA).

Although there is some legitimate concerns raised by critics with regards the pay and conditions of these employees, it is important to consider these concerns through the the lens of the local economy and the opportunity cost of labour. Koros from WWF Nakuru pointed out that the bicyclists that we saw carrying enormous sacks of charcoal would be paid circa $2 for a days labour, and the roads are very dangerous for cyclists given the speed (and recklessness) of traffic.

The flower farms also provide foreign currency which is important to the Kenyan economy.

We did not hear any testimony from the aforementioned critics of the flower farms vis-a-vis employment conditions and so it is fair to say that the impression that we were left with was one-sided. But this impression was formed in part in consultation with WWF representatives who we would expect to be critical.

So on the one hand there is (arguably) a large and significant positive economic contribution provided by the flower farmers, but what of the conflicts? There are two that we consider on the tour - ecosystem constraints and pastoralists' land rights.

Issue 1 *Ecosystem constraints*

Lake Naivasha is, according to Sarah Higgins from the LNRA, in rather poor (ecological) health. There are two related issues - water abstraction and emissions of pollutants into the Lake. The flower farms pump water from the Lake to the production facilities as do some large scale agricultural producers. In terms of emissions to the Lake, there is a good deal of agricultural fertiliser runoff from these same large-scale farmers.

Despite conservation efforts, the ecological balance of the Lake has been tipped by the introduction of sport fish, including the Nile perch, the North American red swamp crayfish and various aquatic plants. These have affected the hydrological balance in the Lake. In a meeting with the group, Sarah Higgins from the LNRA claimed that the ecosystem pollution created by flower production is very small owing to the following:

1. pesticides are expensive and thus it is in the interests of the flower farmers to avoid releasing them to the Lake;

2. specialists monitor a greenhouse and check for any pests - pesticides are only applied to affected flowers - they are not applied wholesale;

3. the move towards hydroponics reduces pesticide use further.

We were not able to test the veracity of these claims during the study tour, but they do seem reasonable.

Issue 2 *Pastoralists land rights*

The Maasai have been active in Lake Naivasha for many, many generations. There is currently a conflict as they demand right of access for their livestock to the Lake. There are three separate causes for this demand:

1. the Maasai claim the land around the Lake as theirs by rights;

2. the Lake is important as a source of drinking water for livestock;

3. customary Maasai practice is for Maasai cattle to put their feet in the water

The issue of pastoralism and land rights was discussed over two days, with meetings with two separate Maasai community representatives. The Maasai claim that their access to the Lake has been blocked by the purchase of large-scale farms. They were given 18 'corridors' to the Lake but (as of May 2007) only 2 were accessible, the rest being impassable either because of farming and/or because the terrain was too rocky.

A Maasai chief describes the plight of his community arising from the lack of access to Lake Naivasha for drinking water for livestock

We discussed the possibility of piping water to the Maasai communities or boreholes being created - both met with some enthusiasm, but neither scenario meets need no.3 above. The Maasai claim that there is an impending crisis owing to this water shortage.

A legal issue that exacerbates this problem is the designation under Kenyan law of 'idle land'. Maasai community land is often thus titled, even though it is productive for the community as a whole which in turn is reluctant to do away with age-old traditions of common property resource tenure and management. This idle land can and has been seized from the community and registered to private (non-Maasai) farmers.

This links with the EE theory discussed in semester 1 on property rights and institutional structures.

The counter-argument to the Maasai claims was presented by Sarah Higgins. First, the Maasai did actually sell their lands and thus it is claimed should have no grievance now about this. Second, farmers are reluctant to allow Maasai cattle movement along the corridors as (it is claimed) they destroy fences and agricultural crops. Third, the livestock disturb the sediments in the Lake therein increasing the extent of the ecological problems in the Lake. Further, access requires that reedbeds are cut back: reedbeds act as a natural

It is fair to say that there is no resolution of this particular conflict, but we did meet individuals on both side of the argument during the study tour.