



**IFAR 2006 Professional Development Program
Completion Report
[800 words]**

Instructions:

Please submit the completion report by email, using this form, through the sponsoring CGIAR Center to ifar@ifar4dev.org within three months after the completion of the fellowship.

Please check if Thalwitz Scholarship

Yes

Name of Applicant ----DR. ANNE W. MUIGAI-----

Sponsoring CGIAR Center INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

I. Work Program goals achieved (maximum length: 200 words)

Blood samples were obtained from 40 individuals from nine indigenous sheep populations from Northern Kenyan towns including Mandera, Garissa and Turukana and GPS coordinates and photographs taken. DNA was extracted from the blood samples and PCR amplified using 15 microsatellite markers. The PCR products were diluted and loaded on a ABI 3730 DNA analyzer (Applied Biosystems). Analysis of the 15 microsatellite loci showed that the populations studied have a high level of genetic diversity since the Mean Number of Alleles, expected and observed heterozygosity values for all populations were high at 7.10, 0.63 and 0.68 respectively. Analysis of Molecular Variance (AMOVA) indicated that 94.7% of this diversity was found within the individuals in the populations. With the exception of two populations, most populations were in Hardy-Weinberg equilibrium. The genetic differentiation as measured by GENEPOP 3.3 was low at 5.3% but with a high level of significance ($P < 0.001$). This could be due to the fact that all the populations were sampled from the same region, i.e. Northern Kenya and hence some crossbreeding between neighboring populations is expected. Phylogenetic analyses revealed closer relationship between the Somali breeds than with the other indigenous breeds from North-western Kenya.

II. Plans for follow-up (maximum length: 200 words)

This project was part of the effort to characterize the indigenous sheep of Kenya. This study has shown that the diversity within these populations in Northern Kenya is sufficient to support their conservation. The conservation strategy will involve the maintenance of the indigenous populations in their natural environment and with the involvement of their keepers. The with collaboration of government livestock extension workers in the region, we will impress upon the keepers on the importance of limiting crossing with sheep from neighboring tribes as is often the case in shared watering holes.

With the sheep of Northern Kenya now fully characterized, the next phase of the project will involve the characterization of the sheep found in Central Kenya and along the Coastal region. The collaborative linkage established with the International Livestock Research Institute will be maintained during this next phase of the project and will involve new partners like the Kenya Agricultural Research Institute, who have research stations in these areas. The results from this next phase and including those from this study will be presented at an international conference and will be published in a peer review journal. The contribution of IFAR will be duly acknowledged.

**III. Report budget utilization including whether budget was spent as planned
(maximum length: 100 words)**

The budget was spent as planned in the following manner:

Microsatellite genotyping costs.	4,000
Vehicle hire.....	900
Laboratory reagents.....	3,620
Laptop computer.....	1,500
Total.....	10,020

**IV. Assessment of the fellowship experience and general comments.
(maximum length: 300 words)**

The fellowship has contributed immensely to the conservation of the indigenous sheep of Northern Kenya. From the study it is clear that there is no immediate need to establish nuclear herds of the indigenous sheep since they have sufficient genetic diversity within the populations. The strategy will to ensure the populations conservation by educating their keepers on the importance of maintaining clear genetic lines and avoid genetic mixing with sheep from the neighboring indigenous tribes. The fellowship contributed immensely to the strengthening of the collaborative link between Jomo Kenyatta University of Agriculture and Technology and ILRI. This collaboration has been extremely beneficial since it allowed Dr. Muigai access to state of the art biotechnology facilities that are available at ILRI at no charge. The characterization of the indigenous livestock of Kenya is directly contributing to the documentation of their risk status, which is in line with the CGIAR Science Council's Research priority, more particularly System Priority 1 "Conservation and characterization of genetic resources", sub-priority 1d "indigenous livestock breeds"