



**IFAR 2008 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 -----Charles Lung'aho Shem-----

Sponsoring CGIAR Center

--International Potato Centre (CIP)----

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

Surveys. Field surveys using structured questionnaires were carried out in two sites to assess the extent of potato genetic erosion. Information captured included potato varieties currently grown by farmers, varietal characteristics preferred by farmers, incidence of loss of previously grown varieties, perceived reasons for loss of previously grown varieties and farmers' socioeconomic conditions. A total of 384 farmers were interviewed.

Morphological characterization. Cultivars obtained from the study sites were characterized using the standard potato descriptors. Characters evaluated included sprouts characteristics (shape, habit of tip, colour), plant characteristics (growth habit, foliage structure, leaf openness, presence of secondary leaflets) plant height, maturity, tuber characteristics (shape, depth of eyes, skin colour, flesh colour) and postharvest attributes (ease of sprouting, cooking quality).

Molecular studies. DNA extractions from collected cultivars were performed on leaf material. Microsatellite polymorphism analyses were performed using a set of 24 primers that form the Potato Genetic Identification (PGI) kit (viz. STG0001, STG0025, STG0010, STG0016, STI0001, STI0003, STI004, STI00012, STI00014, STI0030, STI0032, STI0033, STM0019a,b, STM0031, STM0037, STM1052, STM1053, STM1064, STM1104, STM1106, STM5114, STM5121, STM5127). DNA of some 63 genotypes which is part of the PGI kit was used a molecular weight ladders. Some 70 genotypes were evaluated on a ABI capillary platform facilitated by the Genotyping Support Service of the Generation Challenge Program (complementary activity).

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

- a) Continue on a countrywide study to characterize and conserve potato germplasm available in the country
- b) Compare genotyping data obtained with the ABI capillary electrophoresis and those produced by CIP by LICOR gel electrophoresis
- b) Use other markers like Diversity Array Technology (DArT) to genotype the Kenyan germplasm collection and make comparisons with information obtained from SSRs.
- c) Eliminate viruses from Kenyan potato germplasm collection using a combination of techniques including meristem culture, thermotherapy and cryotherapy. Following which the genotypes will be conserved using *in vitro* techniques so that they are available for future breeding
- d) Initiate collaborative activities with other potato programmes to broaden the genetic base of the Kenyan potato programme
- e) The collaboration with CIP will be strengthened further with possibilities of new joint activities that will most likely include other partners
- f) The results arising from this work will be written up and submitted to peer reviewed journals. At least two publications will be prepared.

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

The overall utilization of funds was one hundred percent of the approved project budget with funds being generally spent as planned. The budget was adequate to undertake all the proposed activities except for the participation to a workshop on molecular data analysis of the Genotyping Support Services at CIAT Colombia in December 2008 which we were not aware of at the time of submission of the proposal. A sharp rise in fuel costs in the country during the fellowship period caused an increase in costs associated with transport.

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

The fellowship afforded me an opportunity to better appreciate the application of modern tools in plant science. My scientific capacity to work with molecular markers was greatly enhanced as a result of the hands –on experience in working with marker technology which I had. The fellowship resulted in improvement of my research and analytical skills thanks to my participation to a workshop on molecular data analysis of the Genotyping Support Services GSS at CIAT, Colombia.

I learnt how to develop and administer a genetic erosion survey tool as well as the application of geographic information systems (GIS) in plant genetic resource conservation. I interacted with international scientists and worked in state of the art facilities thereby improving my exposure to the operations and workings of the CGIAR System. The scientific mentoring that I received from the CGIAR scientists throughout the fellowship period was very valuable. I believe this will significantly contribute to faster attainment of my career goals and overall professional development.

The already existing linkages between Kenya Agricultural Research Institute (KARI) and the International Potato Centre (CIP) were further strengthened through the fellowship. It is anticipated that this will lead to future collaborative work with improved outputs as the two institution endeavor to use potato science for the benefit of resource poor farmers.

I had the opportunity of identifying research needs that will assist my institution to further its research agenda in the area of utilization of potato germplasm for the benefit of resource poor farmers.

All in all, I was very pleased with the fellowship and would not hesitate to recommend it to any upcoming developing country scientist as an important opportunity to enhance their professional development. Future fellowship beneficiaries in potato research will, no doubt, find the International Potato Centre (CIP) an important and reliable partner.