

CURRICULUM VITAE

1.0 Personal Information

Name: Lawrence O. Gumbe
Date of Birth: 28 July 1957
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2.0 Education and Qualifications

Date	Institution	Qualification
Sept. 1984-Sept. 1987	Ohio State University Columbus, Ohio, USA	Ph.D
Sept. 1980-Sept.1981	Cranfield University, Silsoe College, England	M.Sc
Sept. 1977-July, 1980	University of Nairobi, Kenya	B.Sc

3.0 Professional Activities

- Kenya National Academy of Sciences Member
- National Environment Management Authority Lead Consultant
- Engineers Registration Board of Kenya Registered Consulting Engineer
- Association of Consulting Engineers of Kenya Member
§ Council Member
2002 – 2010
- Architectural Association of Kenya – Engineering Member
- Institution of Engineers of Kenya Member
§ Council Member
1993 -1995
- Kenya Society of Agricultural Engineers Member
§ Chairman

- American Society of Agricultural Engineers 1993 – 2003
Member (Former)
- American Society of Heating Ventilating and Air Conditioning Engineers Member (Former)

4.0 Appointments and Experience

- July 1998 - Associate Professor, Department of Environmental and Biosystems Engineering, University of Nairobi
- Mar. 1994 - to Date - Chief Executive Officer, Log Associates Consulting Engineers, Economists, Agriculturalists and Planners. Nairobi, Kenya
- Oct 1989 –Mar.1995 - Associate, Professional Consultants, Consulting Engineers, Nairobi, Kenya
- Mar. 2005 – to date - Director of Programmes, African Centre for Technology Studies
- Mar. 2003-Mar. 2006 - Chairman, Department of Environmental and Biosystems Engineering, University of Nairobi
- Mar.1998 – Mar.2000 - Chairman, Department of Agricultural Engineering, University of Nairobi
- Apr.1995 – Aug.1997 - Visiting Scientist, Silsoe Research Institute, England. Made various visits.
- Nov. 1989 – Jul.1998 - Senior Lecturer, Department of Agricultural Engineering, University of Nairobi
- Sept.1987 – Nov. 1989 - Lecturer, Department of Agricultural Engineering, University of Nairobi
- Feb.1989 –Sept.1989 - Part-time Lecturer, Appropriate Technology Centre, Kenyatta University
- Sept.1984 –Sept.1987 - Ph.D. Student and Teaching Assistant, Ohio State University, Columbus, Ohio U.S.A
- Oct.1981 –Sept. 1984 - Tutorial Fellow, Department of Agricultural Engineering, University of Nairobi
- Oct.1980 –Sept. 1981 - M.Sc. Student, Cranfield University, England

- Jul. 1980 – Oct. 1980 - Coffee Factory Engineer, Ministry of Agriculture, Nairobi
- Nov. 1976 – Oct. 1977 - Accounts Clerk, Ministry of Agriculture, Kisumu

5.0 Curriculum Development

I participated in the production of the 8-4-5 curriculum for the B.Sc. programme in Agricultural Engineering in the late 1980s. At the same time, I was also part of the team which produced the curriculum for the Master of Science degree programme studies in the same Department.

In 1996, I was appointed to the Curriculum Review Committee of the Faculty of Engineering. We were able to produce a proposal for review of the curriculum in the Faculty. Some of our recommendations have been implemented.

I championed the review of Agricultural Engineering Curricula in Africa and elsewhere. I organized many workshops including at the University of Nairobi, at Egerton University, at Jomo Kenyatta University of Agriculture and Technology, and at the University of Zambia. In Zambia, our paper on review raised a lot of interest. Some of its proposals have been implemented at various universities including: JKUAT, University of Nairobi, Egerton and Pretoria. The paper has been cited by various authors as far away as the USA

Despite very many difficulties, I was able to lead the efforts of the implementation of a new curriculum in Environmental and Biosystems Engineering at the University of Nairobi. The programme has been implemented as follows:

1. Undergraduate

i **Bachelor of Science** in Environmental and Biosystems Engineering with specialisation in:

- a. Process and Food Engineering
- b. Power and Machinery Engineering
- c. Environmental Engineering
- d. Irrigation and Water Engineering
- e. Structures Engineering

ii **Bachelor of Science** in Biomedical Engineering.

The proposal has reached the Deans committee

iii **Bachelor of Science** in Chemical Engineering

The proposal is at the School level.

2. Postgraduate

2.1 Masters

- i **Master of Science and Master of Engineering** in:
 - a. Process and Food Engineering
 - b. Power and Machinery Engineering
 - c. Environmental Engineering
 - d. Irrigation and Water Engineering Structures Engineering
- ii **Master of Science** in Technology Policy Studies.

The proposal is at the School level

2.2 Doctor of Philosophy and Doctor of Engineering

The proposals for the degrees of the Doctor of Philosophy and Doctor of Engineering are at the Board of Postgraduate Studies level

6.0 Subjects taught

I have taught the following subjects:

Postgraduate

Subject	Institution
§ Building Materials	University of Nairobi
§ Total Energy Systems	Kenyatta University
§ Computer Programming	Kenyatta University
§ Environmental and Functional Design of Structures	University of Nairobi
§ Structural Analysis and Design	University of Nairobi
§ Introduction to Continuum Mechanics	University of Nairobi
§ Elasticity, Plasticity, Elastoplasticity Viscoelasticity, Elastoviscoplasticity	University of Nairobi

Undergraduate

Subject	Institution
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§ Process Engineering	University of Nairobi
§ Introduction to Engineering	University of Nairobi
§ Heating, Ventilating and Air-Conditioning	University of Nairobi
§ Structural Design	University of Nairobi
§ Experimental Stress Analysis	University of Nairobi
§ Physical Properties of Biological Materials	University of Nairobi
§ Construction Management	University of Nairobi
§ Engineering Properties of Materials	University of Nairobi
§ Kiswahili	Ohio State University

7.0 Research Experience

7.1 Funding

My research has been funded through donors including:

- § British Council
- § World Bank (ARF project of Kenya Agricultural Research Institute)
- § Habitat
- § Swedish International Development Cooperation Agency
- § National Council for Science and Technology
- § Coffee Research Foundation
- § Food Agricultural Organization and United Nations Development Programme
- § Commonwealth Science Council
- § Deans Committee of the University of Nairobi

In the period 1995 – 1999, I initiated a programme entitled, *Environmental and Engineering Analysis of Poultry Production Systems in Kenya*, with the Silsoe Research Institute, England. The programme was funded by the British Council. We were able to take 7 of our staff to Silsoe for various periods of time to work on the programme. The programme produced several publications. Two Ph.D candidates were able to initiate and successfully complete their studies in the programme.

7.2 Areas

I have researched in the following areas:

- Bioprocess Engineering
- Environmental Simulation and Control in Buildings

- Geographical Information Systems
 - Remote Sensing
 - Infrared Spectroscopy
- Grain Storage Structures: Silos, Cribs
- Granular Mechanics: Soil Mechanics, Mechanics of *En-masse* Grains
- Heat Transfer
- Mechanical Properties of Soils
- Oilseed Processing
- Physical Properties of Biological Materials
- Renewable Energy: Biogas, Solar Energy
- Structural Composites: Ferrocement, Fibre Reinforced Concrete
- Thermal Properties of Building Materials
- Timber: Engineering Properties
- Waste Management

8.0 Postgraduate Supervision

Doctor of Philosophy

- **Nyaanga, D.M. 2000** Temperature Fluctuations in Bulk Potato Storage. Graduated in.
- **Gitau, A.N. 2004** Mechanical Behaviour of Hard-Setting *Luvisol Soil* of Semi-arid Machakos District Kenya.
- **Mbuge, D.O. 2009** Predicting the Service Life of HDPE Plastic used for Lining Reservoirs using Viscoelasticity.
- **Omuto, C.T. 2008** Large Area Soil Physical Degradation Assessment: The use of GIS, Remote Sensing and Infrared Spectroscopy in arid and semi-arid Kenya
- **Adan, A.A. 2009** Characterization and Management for Household Waste in Urban and Peri-Urban Environment in Kenya

On-going

- **Obiero, J.P.O.** An Infiltration Approach to Surface Runoff Prediction on Kenyan Catchments.

- **Ondieki, S.** Review and Update of the Hydrology of Lake Victoria

Master of Science

- § **Nindo, C. I. 1991** Performance of Seed Processing Operations. University of Nairobi.
- § **Mburu, J.K. 1991** Dewatering and Drying Characteristics of Coffee Pulp. University of Nairobi.
- § **Nyaanga, D.M. 1992** Factors Affecting the Bulk Size of Potatoes During Storage. University of Nairobi.
- § **Mutua, J.M. 1993** Mechanical Properties of Sisal Fibre Reinforced Concrete. University of Nairobi.
- § **Kipyakwai, J.K. 1998** Drying of Potatoes Slices. University of Nairobi.
- § **Onyango, D.M. 2000** Mechanical Properties of the Bamboo (*Bambusa vulgaris*) Grown in Muguga Kenya.
- § **Taragon, J.K. 2000** Determination of Structural Properties of Naturally Dried Bluegum Timber
- § **Mutai E. B. K. 2002** Environmental Simulation and Control of Poultry Housing Systems in Kenya.
- § **Agullo, J. O. 2003.** Environmental Simulation of a Green House System in Kenya.
- § **Oranga. E. 2003** Elastoplastic and Viscoelastic Behavior of Shelled Maize *En-Masse*.
- § **Njoroge, R.N. 2005** Drying of Parchment Coffee: A Study of the Influence of the Parchment Hull in thin-layer drying
- § **Akendo. I.O. 2008** Dewatering and Drying Characteristics of Water Hyacinth (*Eichhornia Crassipes*) Petiole

9.0 External Examination

- § Jomo Kenyatta University of Agriculture and Technology. Department of Agricultural Engineering: 1996 - 1998.
- § University of Malawi. Department of Agricultural Engineering: 1993 - 1995
- § Egerton University. Department of Agricultural Engineering: 1992 - 1995

10.0 Theses

- § Ph.D. Thesis Title: Mechanical Properties of Granular Materials as Related to Loads in Cylindrical Grain Silos
- § M.Sc. Thesis Title: An Investigation of the Effectiveness of Some Thermal Insulation Materials for Buildings
- § B.Sc. Dissertation Title: Sundried Clay Bricks

11.0 Sabbatical Leave

- § 1995: At the Silsoe Research Institute, England. Worked on a project entitled, ***Environmental and Engineering Analysis of Poultry Production Systems in Kenya***. The work involved mathematical modelling of the micro-climate in poultry housing and computer simulation

12.0 Languages

- § English - Excellent
- § Kiswahili - Excellent
- § French - Good command
- § Dholuo - Excellent
- § Lingala - Excellent
- § Arabic - Basic

13.0 Publications

Book

Rural Structures in the Tropics: Engineering Design and Development. FAO. Rome. Italy. In Press

Papers

Gumbe, L.O, Agullo, J.O, Brugger, M.F. 2009. Environmental Simulation of a Greenhouse System in Kenya. African Journal of Sciences and Technology. Science and Engineering Series. 10 (2): 108- 121

Omuto, C.T. and L.O. Gumbe. 2009. Estimating Water Infiltration and Retention Characteristics Using a Computer Program in R. Computers and Geosciences. 35: 579-

Omuto, C.T. and L.O. Gumbe 2007. HydroMe: Estimation of Soil Hydraulic Parameters from Experimental Data. R. Comprehensive R Archive Network. USA (<http://cran.r-project.org/web/packages/HydroMe/index.html>)

Omuto, C.T. Shepherd, K.D., Walsh, M.G and Gumbe, L.O. 2006. Soil Physical Degradation Screening in Tropical Watershed. A Case study of Arid and Semi-arid Land in Eastern Kenya. In Proceedings. Environmental Change, Geomorphic Processes, Land Degradation and Rehabilitation in Tropical and Subtropical Highlands: 19-25 September, 2006. Mekelle University. Ethiopia

Gitau, A.N., L.O. Gumbe and E. K. Biamah. 2005. Influence of Soil Water on Stress-strain Behaviour of a Compacting Soil in Semi-arid Kenya. Soil and Tillage Res. 85 (3): 1-11 STILL 2146: Elsevier B.V. The Netherlands.

Gitau, A.N and L.O. Gumbe. 2005. Mechanical Behaviour of Hard Setting Soils of Semi-arid Kenya. In Proceedings. 3rd World Congress on Conservation Agriculture. Nairobi Kenya. Linking Production, Livelihoods and Conservation. 3rd-7th Oct. 2005. CD-ROM. Pp 62-70.

Gitau, A.N and L.O. Gumbe. 2004. Alleviating Soil Hardpan Formation for Conservation Farming: Case of Semi-arid Kenya. Euro-Asia Journal of Applied Sciences. Vol. 2 No. 3 (ISSN: 1450-202X).

Gitau, A.N and L.O. Gumbe. 2004. Alleviating Hard Pan Formation in the Semi-arid Kenya Soils for Conservation Farming. In Proceedings. Regional Workshop on Conservation Agriculture and Rainwater Harvesting. 17-19 November 2004. Addis Ababa. Ethiopia CD-ROM. Pp. 199-215.

Gitau, A.N and L.O. Gumbe. 2004. Triaxial Testing of Agricultural Soil. In Proceedings, 2004 CIGR International Conference. Beijing. China. 11-14 October 2004. CD-ROM. Paper No. 10-114A.

Mutai, E. B. K and L.O. Gumbe. 2003. Environmental Modelling of Poultry Structures. JEAE(3): 24- 31.

Gumbe, L.O. 2003. Engineering and the Future. American Society of Civil Engineers. Virtual World Congress for Civil Engineering. www.ceworld.org.

Nyaanga, D. M and L.O. Gumbe. 2002. A Simplified Temperature Prediction Model for Potatoes Stored Under Natural Convection. JEAE. (2) 70 – 73.

Nyaanga, D. M, L.O. Gumbe and I. Otieno. 2001. A Computer Program for Predicting the Storage Environment of Crops. Proceedings of Kenya Society of Agricultural Engineering Annual Conference of 2001.

Gumbe, L.O. and E. Mutai. 2001. Simulation and Control of Poultry Production Systems in Kenya. Proceedings the International Conference on Agricultural Science

and Technology (ICAST 2001). 7-9 November 2001. Beijing, P. R. China.

Gumbe, L.O. and J.K. Taragon. 2000. Creep and Stress Relaxation Behaviour of Naturally Dried Blue-Gum Timber. *Agricultural Engineering in South Africa.* 32(1)135 – 142.

Nyaanga D.M. and L. Gumbe. Prediction of Bulk Potato Temperature During Free Natural Ventilation Storage. *Agricultural Engineering in South Africa.* 32(1)93 – 104.

Odhiambo, F.O. and L.O. Gumbe. 2000. Water Resources and Infrastructure Development in Kenya Proceedings of the Symposium of Water Resources and Sanitation Management in Kenya. Tom Mboya Labour College. Kisumu 11- 12 May.

Nyambane, V, J.O. Amalla, L.O. Gumbe and J. Randall. 1999. Simulation of the Environment in a Poultry House. *Journal of Engineering in Agriculture and the Environment.* 1(1):37-47.

Gumbe, L.O. 1999. Blue-gum Timber as a Structural Material. Proceedings of the Forestry Engineering for Tomorrow Conference. Timber. Edinburgh. Scotland. 28- 30 June.

Kaunda, K. and L.O. Gumbe. 1999. Calorific Content of Water Hyacinth. Proceedings of the Annual International Conference of the Kenya Society of Agricultural Engineers. 7-8 October. Intercontinental Hotel. Nairobi.

Taragon, J. K. and L.O. Gumbe. 1999. Viscoelastic Properties of Bluegum Timber. Proceedings of the Annual International Conference of the Kenya Society of Agricultural Engineers. 7-8 October. Intercontinental Hotel. Nairobi.

Onyango, D.M. and L.O. Gumbe. 1999. Strength Properties of the East African Bamboo. Proceedings of the Annual International Conference of the Kenya Society of Agricultural Engineers. 7-8 October. Intercontinental Hotel. Nairobi.

Gumbe, L.O, D.A. Mutuli, M.O. Marenja and S.N. Ngigi. 1999. Proposed New Curriculum in Engineering for Agriculture and the Environment at the University of Nairobi. Proceedings of the International Conference on Agricultural Engineering Curriculum and Employment Profile. Lusaka. Zambia. 28 – 30 June.

Mutua, J.M, L.O. Gumbe and S.M. Mutuli. 1999. Interfacial Bond Strength for Sisal Fibre Composite. *Discovery and Innovation.* 10(1/2): 60-64.

Gumbe, L.O. 1998. Controlling the Water Hyacinth in Lake Victoria. Proceedings of the Annual International Conference of the Kenya Society of Agricultural Engineers. 7-9 October. Nairobi Safari Club. Nairobi.

Nyaanga, D.M, L.O. Gumbe, D. Burfoot and Y. Xu. 1998. Prediction of Temperatures in Naturally Ventilated Potato Storage. Proceedings of the Annual International Conference of the Kenya Society of Agricultural Engineers 7-9 October. Nairobi Safari Club. Nairobi.

S. Ondimu and L.O. Gumbe. 1997. Mechanical Properties of Blue-gum Timber. Landwards. 25(4): 24-26.

Mutua, J.M. , L.O. Gumbe and S.M. Mutuli. 1997. Some Mechanical Properties of Sisal Fibre Concrete. Discovery and Innovation. 9(3/4): 189-196.

Gumbe, L.O. 1997. Food Engineering for Development: The Cases of Edible Oil and Dairy Industries in Kenya. Proceedings of the Seventh International Congress on Engineering and Food. 13 -17 April. Brighton. England.

Gumbe, L.O. 1997. Mechanics of Cereal Grains. Proceedings of the Seventh International Congress on Engineering and Food .13 -17 April .Brighton. England.

Gumbe, L.O. 1997. Food Security in Africa: Options for Grain Storage. Paper Presented at the ARSSN Workshop. KCB Training College. Karen. Nairobi. Feb 1997.

Wambua T.M, and L.O. Gumbe. 1997. Determination of Mechanical Properties of Fresh Avocado Fruits. Proceedings of the Annual International Conference of the Kenya Society of Agricultural Engineers. 6- 8 August. Milimani Hotel. Nairobi.

Gumbe, L.O, 1996. The Environment and Waste Management in African Agriculture. Paper Presented at SESAE96 International Conference. Arusha. Tanzania. 2- 4 October.

Mburu, J.K, L.O. Gumbe and D. K. Some. 1995. Dewatering and Drying Characteristics of Coffee Pulp. II: Drying Characteristics. Kenya Coffee. 60(703): 2003 - 2008.

Mburu, J.K, L.O. Gumbe and D.K. Some. 1995. Dewatering and Drying Characteristics of Coffee Pulp. I: Dewatering Characteristics. Kenya Coffee. 60(702): 1975 - 1983.

Gumbe, L.O. 1995. Load-Deformation Behaviour of Soils and En-Masse Grains. Proceedings of the Symposium on Unsaturated Soil Behaviour and Applications. Nairobi. Kenya. 22 - 23 August.

Gumbe, L.O. and E.M. Gatai. 1994. Dynamic Circumferential Wall Strains in Cylindrical Silos. International Journal of Biochemiphysics. 17 - 19.

Gumbe, L.O and J.W. Kinaga. 1994. Rural Oil Processing in Kenya: An Overview. Proceedings of the Regional Workshop on Small Scale Oil Processing. AGROTEC. Arusha. Tanzania. September 5 - 6.

Nyaanga, D.M, L.O. Gumbe and E.N. Mwaura. 1994. Development of an Equation/Model for Predicting Temperature in Stored Potatoes. Proceedings of the International Conference of the Kenya Society of Agricultural Engineers. August 3 - 5, Nairobi.

Nyaanga, D.M., L.O. Gumbe and E. N. Mwaura. 1994. Quantitative Changes in Some Physical Properties of Potatoes During Storage. Proceedings of The International Conference of the Kenya Society of Agricultural Engineers. August 3 - 5, Nairobi.

Nyaanga, D. M., L. O. Gumbe and E. N. Mwaura. 1994. Temperature Fluctuations in Stored Potatoes. Proceedings of the International Conference of the Kenya Society of Agricultural Engineers. August 3 – 5. Nairobi.

Gumbe, L.O. 1993. A Discussion on Constitutive Equation for Granular Materials En-masse. East African Journal of Engineering. 1(1): 27 – 38.

Gumbe, L.O. and E.N. Mogere. 1993. Selected Physical Properties of Sorghum Grains. KIFST Review. 4(2): 49 - 67.

Gumbe, L.O. 1993. Rheological Models for Shelled Maize En-masse. Proceedings of the 6th International Congress on Engineering and Food. Makuhari, Chiba. Japan. May 23-27.

Gumbe, L.O. and W.R. Onyango. 1992. Grain Moisture Content Effects on Pressures in Grain Silos. Discovery and Innovation. 4(2): 49 - 52.

Gumbe, L.O. 1990. Material Characterisation and Prediction Equations for Loads in Silos Containing Granular Materials En-masse. African Journal of Science and Technology, Series A: 8(1): 1 - 5.

Gumbe, L.O. and B. M. Maina. 1990. Elastoplastic Constitutive Parameters for Rice En-masse. African Journal of Science and Technology, Series A: 8(2): 15 - 25.

Gumbe, L.O. and C. Maina. 1990. Friction Coefficient of Cereal Grains on Various Surfaces. Journal of AMA. 21(4): 61 - 64.

Gumbe, L.O. and P.K. Serem. 1990. Mechanical Properties of Fibre Reinforced Concrete Roofing tiles. American Society of Agricultural Engineers. Paper No. 90-5011.

Nindo, C.I , L.O. Gumbe and D. K. Some. 1990. Drying of Seed Maize. Proceedings of the Kenya Society of Agricultural Engineers Conference. Nairobi. August 1 - 3.

Gumbe, L.O. 1989. Physical Properties of Coffee. American Society of Agricultural Engineers. Paper No. 89-6109.

Gumbe, L.O. 1989. Mechanical Properties of Coffee. Agricultural Engineering. A Balkema. Rotterdam. Netherlands. 4: 2467 - 2470. Proceedings of the CIGR Congress.

Gumbe, L.O. 1989. Physical Properties of Grain Affecting Silo Pressures. Proceeding of the 10th International Symposium on Agricultural Engineering. Beijing. China. September 12 - 14.

Gumbe, L.O. 1989. Considering Material Behaviour in Silo Design. Kenya Engineer. March/April 1988.

Gumbe, L.O. 1988. Prediction Equations for Loads in Grain Silos. Proceedings of the NSAE/CIGR Symposium. September 4 - 10 Illorin. Nigeria.

Gumbe, L.O. 1987. Energy for Agriculture Including Energy Plantation: Special case of Biogas Slurry system for Small Scale Kenyan Farmers. Papers presented at the Former DAAD scholarship holders seminar. October 22 – 24. Nairobi. Kenya.

Muchiri, G. and L.O. Gumbe. 1983. Biogas Slurry Systems, Biogas for Rural Development. CSC Technical Publication No. 137.

Gumbe, L.O. 1983. Appropriate Technology and Prospects in Grain Storage. Kenya Institute of Food Science and Technology Journal. 1(3): 36 - 42.

Gumbe, L.O. 1983. Bachelor of Science in Agricultural Engineering Course. Paper presented at the Agricultural Engineering Inter-University subject Meeting. September 5 – 10. Arusha. Tanzania

XIV. Consultancies

Environment:

- **Regional Workshop on mainstreaming Environmental and Social Management Framework for Project Preparation and Implementation of NELSAP Programmes in Rwanda. 2010:** The objectives of this assignment were to facilitate a workshop on mainstreaming of environmental and social management framework for the NELSAP in order to:
 - § Enhance comprehension of the ESMF instrument and its application
 - § Enhance NELSAP technical capacities to integrate Environmental and Social assessment procedures into projects cycle especially during the identification and the preparation phase (pre-feasibility studies, feasibility studies, detailed design studies) and identify the existing gaps and weaknesses
 - § Draft a template of Environmental and Social Guidelines and procedures for NELSAP Program and Projects, with identification of the key actors.

- **Rural Electrification Authority. 2010: Environmental & Social Impact Assessment of the Proposed Off-Grid Diesel Power Generating Stations and Associated Substations: Lokitaung, Lokori and Faza Island**

The objectives of the assignment were to:

- § Identify and assess potential environmental and social impacts of the projects
 - § Identify all potential significant adverse environmental and social impacts of the proposed project and recommend measures for mitigation
 - § Verify compliance with the environmental regulations and industry standards
 - § To identify problems (non-conformity) and recommend measures to improve the existing management system
 - § To assess compliance with company's corporate environmental policy requirements
 - § To prepare an Environmental Impact Assessment report compliant to the Environmental Management and Coordination Act (1999) and detailing findings and recommendations
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- **The Kenya Power and Lighting Company limited. 2009/2010: Environmental & Social Impact Assessment and Resettlement Action Plans (RAP) of the proposed Olkaria-Sotik, Kisii-Sondu, Kisii-Awendo 132kV Transmission Line.**

The objective of the assignment were to:

- § Identify and assess potential environmental and social impacts of the proposed project
- § Identify all potential significant adverse environmental and social impacts of the proposed project and recommend mitigation measures

- § Verify compliance with the environmental regulations and industry's standards
 - § Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project life cycle
 - § Recommend cost effective measures to be implemented to mitigate against expected impacts
 - § Prepare an Environmental Impact Assessment report compliant with the Environmental management and Coordination Act (1999) and detailing findings and recommendations
 - § Identify and quantify different categories of project-affected people (PAPs) who would require some form of assistance, compensation, rehabilitation or relocation
 - § Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project
 - § Verify the adherence and compliance of the World Bank's Safeguard Policies
- **The Kenya Power and Lighting Company limited. 2010: Environmental & Social Impact Assessment of the Proposed Juja Road 132/66/11 KV Substation Renewal.**

The objective of the assignment were to:

- § Identify and assess potential environmental and social impacts of the proposed project
 - § Identify all potential significant adverse environmental and social impacts of the proposed project and recommend mitigation measures
 - § Verify compliance with the environmental regulations and industry's standards
 - § Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project life cycle
 - § Recommend cost effective measures to be implemented to mitigate against expected impacts
 - § Prepare an Environmental Impact Assessment report compliant with the Environmental management and Coordination Act (1999) and detailing findings and recommendations
 - § Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project
 - § Verify the adherence and compliance of the World Bank's Safeguard Policies
- **Kenya Power and Lighting Company Limited. 2009:** A study to update the Environmental and Social Impact Assessment, (**ESIA**) and develop an Environmental and Social Management Plan (**ESMP**) and a Resettlement Action Plan (**RAP**) for the 400 kV Mombasa - Nairobi Transmission. The objectives of the assignment included:
- Updating the 2006 and 2007 ESIA project report (Ref. Vol. 1 and Vol. 2)
 - Preparing a detailed ESMP to address the anticipated

- negative environmental and social project impacts
 - Preparing a detailed Resettlement Action Plan (RAP) with clearly worked out compensation costs
- **Ministry of Environment and Mineral Resources (MEMR): Environmental and Social Impact Assessment (ESIA) of the proposed abandoned selected quarries in Kayole for Solid Waste Disposal. 2009:** The project identified all potential significant adverse environmental and social impacts of the project and recommended measures for mitigation, verifying compliance with the environmental regulations and standards, identifying problems (non-conformity) and recommend measures to improve the existing management system, preparing an Environmental Impact Assessment report compliant to the Environmental Management and Coordination Act (1999) and detailing findings and recommendations. It also assessed the technical options for land filling the three abandoned quarries. These were through Clean Development Mechanism (CDM) and Non- CDM approaches available for land filling the quarries.
- **Kenya Agricultural Research Institute (KARI): Mid Term Review of the Environmental and Social Performance of the Western Kenya Integrated Ecosystems management Project (WKIEMP). 2008.** The project aimed at: Supporting on-and off-farm conservation strategies through interventions focused on improving soil fertility, agro forestry and introduction of value added cropping systems; and Improving the capacity of local communities and institutions to identify, formulate and implement integrated ecosystem management activities (Including both on- and off-farm land use planning) that capture local, national and global environmental management. The MTR focused on assessing the project's compliance with the Environmental and Social Management Framework (ESMF) procedures proposed in the ESMF document developed at the project onset. It also assessed the adequacy of the institutional arrangements and structures in place for the implementation of the ESMF and the occurrence and potential for cumulative impacts of the project activities funded by the World Bank.
- **Kenya Power & Lighting Co. Ltd. Environmental and Social Impact Assessment. 2007: Rabai - Diani 132 kV and Arusha – Embakasi 330 kV Transmission Lines and associated Substations project being undertaken by KPLC.** The scope of the study included the following tasks; Detailed description of facilities, Description of baseline environment, Description of pertinent legislative and regulatory framework, Determination of impacts of each facility, Description and Analysis of occupational and safety concerns, Development of management plan to mitigate negative impacts, Development of re-settlement action plan, Development of monitoring plan and follow up the issuance of an EIA license by NEMA.
- **Kenya Power & Lighting Co. Ltd. Environmental and Social Impact Assessment. 2007: Chemosit-Kisii and Kamburu–Meru 132 kV Transmission Lines and Associated Substations Project.** The scope of the study included the following tasks; Detailed description of facilities, Description of baseline environment, Description of pertinent legislative and regulatory

framework, Determination of impacts of each facility, Description and Analysis of occupational and safety concerns, Development of management plan to mitigate negative impacts, Development of re-settlement action plan, Development of monitoring plan and follow up the issuance of an EIA license by NEMA.

- **Kenya Industrial and Research Institute (KIRDI). Initial Environmental Audit. 2007:** Carrying out Initial Environmental Audit for its facilities in the three compasses namely: Nairobi, South “C” Kapiti Road, off Mombasa Road (Headquarters); Nairobi, South “B” Dunga-Lusaka Road and Kisumu, Kibos Road. Relevant baseline environmental data and information will be collected and presented, potential environmental and social impacts identified, mitigation measures for negative impacts will be provided, and a comprehensive Environmental Management Plan (EMP) will be developed.
- **Pyrethrum Board of Kenya. Annual Environmental Audit. 2006:** This was conducted to verify compliance with environmental rules and regulation in undertaking daily operations at the factory by PBK. It entailed physical inspection and holding interactive sessions with the management and employees in checking compliance and work place health and safety. Air emission and effluent samples from the factory were collected and tested at NEMA accredited laboratories. The EMP was revised based on the assessment findings. The exercise was conducted out as per NEMA regulation as stipulated in the Environmental Management & Coordination Act (EMCA).
- **The Kenya Power and Lighting Company Limited. Environmental Audit of all KPLC Facilities. 2005:** The assignment covered 37 transmission substations within the country, fifty seven (57) distribution substations within Western Kenya Region, twenty six (26) distribution substations in Mount Kenya Region, twenty one (21) distribution substations in coast region and twenty two (22) distribution substations in Nairobi Region. Detailed description, geographic, ecological, and general layout of each facility including maps at appropriate scale where necessary were effected. Information on size, capacity, staffing, facilities and services, operation and maintenance activities were also provided. Technical activities, processes and operations undertaken at each facility including input materials, final materials, by products and waste generated were discussed in detail. Occupational health & safety for employees and public at large were assessed and results provided to the client.
- **The Kenya Power and Lighting Company Limited. Environmental Impact Assessment Study for Loss Reduction Projects. 2005:** This involved a total of eight (8) proposed distribution substations and there associated lines namely; Nairobi area (Bahati and Babadogo), Kisumu East in Kisumu area, Sibembe lines in Sibembe area, Kapsabet, Mweiga in Nyeri area, Maria in Meru area, Nakuru – Elburgon line and Nakuru – Nyahururu line. The work took into account all project intervention zones pertaining to the distribution component. All new substation sites and new line routes were visited. However for a detailed social and environmental assessment of pole mounted transformer stations, sample existing stations in Nairobi and in Coastal Area were selected for purposes of overall evaluation.

- **Pyrethrum Board of Kenya. Annual Environmental Audit. 2005:** This was conducted to appraise all activities undertaken pyrethrum Board. Particular attention given to implementation of previous audit recommendations in particular environmental regulatory framework, environmental health and safety measures including personal protective equipment (PPE). Effects of dust, flue gases were assessed including tests of **air emission samples from the boilers**. The testing was performed in NEMA's accredited laboratories. A comprehensive environmental management plan was developed. The exercise was carried out as per NEMA regulation as stipulated in the Environmental Management & Coordination Act (EMCA).
- **Kenya Breweries Limited. Environmental Impact Assessment. 2005:** for installation of four fermentation tanks at their plant in Ruaraka, Nairobi. The assignment involved design of appropriate mitigation management and monitoring measures.
- **Kenya Breweries Limited. Environmental Impact Assessment. 2005:** The project was for modification and conversion of an existing store to house a new Keg Line. The assignment also involved procurement and installation of relevant machinery.
- **Pyrethrum Board of Kenya. Initial Environmental Audit. 2004:** Appraisal of all activities undertaken by PBK giving special attention to environmental regulatory framework, environmental health and safety measures. Also provided was baseline information upon which subsequent environmental control audits will be based and finally formulation an environmental management plan (EMP) and an implementation and monitoring schedule.
- **DHS Company Limited, DOSHI Group of Companies. Environmental Impact Assessment. 2004:** This was conducted for the construction of a weighbridge, toilet block, and a parking bay. Specific tasks undertaken during the study included: location of the project including the physical area that was affected by the project's activities (construction, operation and decommissioning phases); project design; materials, products and by-products including waste to be generated by the project and the methods of their disposal; potential environmental impacts and the mitigation measures to be taken during and after implementation of the project; action plan for the prevention and management of possible accidents during the project cycle and a plan to ensure the health and safety of the workers and neighbouring communities.
- **Pyrethrum Board of Kenya. December. 2004:** Environmental Audit: To appraise all activities undertaken by Pyrethrum Board of Kenya and their environmental impacts. Effects of dust, flue gases were assessed. A comprehensive environmental management plan was developed.
- **Holiday Inn Hotel, Nairobi; Environmental Audit. 2004:** Appraisal of all activities undertaken by the hotel giving special attention to environmental regulatory framework, environmental health and safety measures and

sustainable use of natural resources. Also, the baseline information was provided upon which subsequent environmental control audits will be based and finally the formulation of an environmental management and monitoring plan. The assignment was carried out as per NEMA regulations.

- **Kenya Seed Company Limited. Environmental Audit. 2004:** Appraisal of all activities undertaken by the Kenya Seed Company giving special attention to environmental regulatory framework, environmental health and safety measures and sustainable use of natural resources. Baseline information was gathered and provided upon which subsequent environmental control audits was based. A comprehensive environmental management and monitoring plan was formulated. The assignment was carried out as per NEMA regulations.
- **Sony Sugar Company. Environmental Audit. 2004:** Appraisal of all activities undertaken by the SONY Sugar Company giving special attention to procedures used in preparing land for cane and its environmental impact, effects of SONY Sugar on the soil reserves, effects of vehicle movements, the quality of drainage water in terms of salinity, effect of plastics, effect of power supply, effects of steam supply, effects of sugar dust, Effects of non sugar dust, effects of flue gases among others.
- **Kenya Power & Lighting Co. Ltd. Environmental and Social Impact Assessment Study. 2004:** This involved an Assessment of potential environmental (socio-economic, cultural heritage and biophysical) impacts of the Distribution Component of the Power Sector Recovery Project including evaluation of alternatives and design of appropriate mitigation, management and monitoring measures. The assessment took place in all project intervention zones pertaining to the distribution components including all new substation sites and new line routes. Sampled pole mounted transformer stations in Nairobi and the Coastal area were assessed. The assessment conformed to the Kenyan environmental assessment regulations as administered by the National Environmental Management Authorities (NEMA).

Engineering:

- **World Vision: 2010: Water Feasibility Assessment for Kegonga – Ntimaru Integrated Programme Area.** The purpose of the assessment was to provide World Vision Kenya, Kegonga-Ntimaru IPA, the community, relevant GoK line ministries and key stakeholders with results and recommendations that will inform or guide all decisions required in implementing water and sanitation projects that are community based and sustainable. The assessment made recommendations on identified gaps and how they can be tackled and proposed sound, practical and sustainable solutions for program implementation in a rural set-up.
- **World Vision: 2010: Water Feasibility Study for Magunga Integrated Programme Area.** The objectives of the study were to:
 - § Establish morbidity and mortality rates due to water borne diseases (skin

and eye infections)

- § Assess the extent to which households access potable water
- § Establish the level of usage of the sanitary facilities latrines, bathrooms, bathrooms, dish racks by the households
- § Establish the existing and capacity of the Water Users Association/Water Users committees to manage and maintain valuable water resources
- § Identify sustainable cost effective and sufficient water sources at accessible water distance to the community members in the program area for their improved quality of life
- § Address the causes of community water and sanitation problems and underscore solution to other related projects that is affecting the accessibility of water
- § Assess water resources in the area and propose possible project interventions and analyze community water tariffs to ensure sustainability of the project

- **Lake Victoria South Water Services Board Long Term Intervention Works in Bondo Town-survey, detailed design and development of tender documents (On-going) 2010.** The main objective of this assignment is to assist in the design of water and sanitation infrastructure including the proposition of the social economic components relating to the viable formation and operation of local groups to be involved in the furtherance of pro-poor objectives of the program.

The specific objectives of the project include:

- § Description of the project area in terms of existing water and sanitation situations
- § Assessment of water and sanitation demands of the project area with clear segments for appropriate interventions example informal settlements, peri-urban population and core urban population
- § Design for water and sanitation interventions
- § Environmental Impact Assessment

- **Mumias Sugar Company (Cane Haulage Model Review and Development) 2009:** The main objective of this assignment was to review in detail, the cane haulage costs and payment structure at MSC (Mumias Sugar Company) and recommend an agreeable mode of payment. The assignment involved:

1. Reviewing the MSC cane haulage costing and payment formulae
2. Identifying the input variables to the MSC cane haulage costing and payment formulae
3. Developing a mathematical model for the variables identified in 2 above
4. Using computer simulations to obtain solutions of the mathematical model developed in 3 above
5. Using historical and empirical data to validate and verify solutions in 4 above
6. Using results of 5 above to advice MSC on haulage costs and relevant payment to transporters.

- **Mumias Sugar Company(MSC). Optimized Transport System for Busia Cane Zone. 2007:** The main objective of the study was to identify and study the cane transport systems pertinent to the Busia Cane Zone so as to recommend the institution of an optimised cane transport system.
- **Mumias Sugar Company(MSC). Sugar Cane Transport and Cane Yard Operations Study. 2006:** Project was undertaken to identify challenges in the transport system so as to improve efficiency. The main objective of the study was to identify and assess the operations of MSC and Cane Handling Operations, identify the bottlenecks and propose an improved handling system for handling the sugar cane from the fields to the feed tables. The assignment was in two phases; Phase I-Cane Yard Operations Study and Phase II—Sugar Transportation Study. However due to the interactive nature of the two in sugar production, both phases were effected simultaneously so as to gain a better understanding of the operations, particularly with regard to cycle-times, which is a useful indicator of the efficiency of the entire sugarcane handling operations (cane transportation and unloading operations).
- **Ministry of Agriculture. Design of Ngare Ndare Irrigation Schemes-Meru Central District Under Eastern Province Horticulture and Tradition Food Crops Project (EPHTFCP) 2006:** This study involved the Design of Level II Irrigation Scheme in Meru Central District. The overall goal of the project was to increase the income of the smallholder farmers and ensure food security through increased production of smallholder horticultural and traditional food crops. The main tasks were to understand environmental issues, social economic factors, gender issues etc and the actual Design including preparation of Bill of Quantities, Project Economic Analysis, Project Drawings, Tender Documents, Contract Conditions and Technical Specifications. The EPHTFCP was a development project covering a total of eight districts of Eastern Province namely: - Machakos, Makueni, Embu, Mbeere, Tharaka, Meru South, Meru Central and Meru North. The scheme was done in two phases.
- **Kenya Tea Development Agency Limited. Feasibility Study, Design and Supervision of all works and services for proposed Hydro Power Plants. 2005:** Project on critical analysis of the factory current and future power demands covering the peak, normal, and low seasons. Hydrological, geological and geo – technical survey, Baseline survey including socio economic studies, corporate social responsibility issues and related surveys, Proposals for acquisition of project way leaves for distribution lines, Trouble shooting proposals for statutory approvals, regulatory authorities, health and safety and other conformity requirements. The assignment also encompassed a comprehensive technical report and preliminary estimates of the total project capital cost. Critical environmental issues of great concern were covered under this study. The study covered factories in Kiambu, Thika, Kirinyaga, Embu, Meru, Bureti, Bomet, Nyamira and Kisii.
- **Ministry of Agriculture, Animal Resources & Forestry – Rwanda, CADPLAN Architects. 2004:** Development and Design of Farmers Training Centre and

Agro-Technology Park including drawings of agreed plans.

- **Mumbi Coffee Limited (MCL). 2003:** Compilation and update of a bankable Business Plan and updating of the financials. Design and costing of Thika 1 wet coffee mill, and provision of professional counsel on the improvement of the coffee farms at Thika. Other tasks included description of the principal products of MCL, market of their products, analysis of distinctive competitiveness, essential features of the current technology, regulatory constraints to coffee production, need for replacement of coffee, research and development of new products and the resources required; description of the market outlook, market segmentation and the characteristics of each target segment; identification of the market share of competitors, their strengths, weaknesses and potential, competitive factors in market place, marketplace trends, and danger of entry of new competitors in the future; positions of MCL's products/services in relation to competitors, current and future pricing policies, distribution channels of products, their size and geographical location, sale force compensation policy; manufacturing and operations of MCL; MCL's management; financial analysis including profits and loss, cash flow; minimization of risks and reward when forecasted results are achieved; objectives of each department and the milestones for each major segment of the business plan.
- **Nyakach Community Development Association (NYACODA). 2001:** Consultancy Services for Design, Costing and Supervision of Construction Works of Fish Processing Plant including environmental health and safety, technical human resource, buildings, technology and financial issues. Specific tasks included site investigation, development of architectural sketches, schematic designs and cost estimate, development of architectural and engineering specifications, development of tender and contract documents and specifications, evaluations of pre-qualification data from contractors, invitation of proposals from pre-qualified contractors/ developers, evaluation proposals from pre-qualified contractors/developers and preparation of contract documents for successful contractor/developer and contract negotiations.
- **South Nyanza Sugar Company Limited. Cooperative Merchant Bank. June 2001 to July 2002:** Technical Evaluation and Assessment of plant and machinery including factory operations, agricultural machinery and transport, nucleus estates, outgrowers estates and extension, electrical installations, maintenance, **environmental health considerations**, buildings and external structures, technology, occupational health and safety, business options, technical management and training and development of project implementation frame work for rehabilitation with **Cooperative Merchant Bank**.
- **Institute of Development, Environment and Agricultural Studies (IDEAS). March 2001:** An assessment of the rehabilitation of buildings and infrastructure in Yambio County, New Sudan. Phase II including review of status of structural works, mechanical systems, electrical systems, external systems, estimation of project costs and construction supervision.
- **Areso Millers. July 2001:** Technical Evaluation of Eagle Millers Ltd. Technical Inspection of Plant and Equipment with a view of obtaining the value of the

project assets and the viability of the same.

- **Kenya Sugar Authority (KSA) National Sugar Research Center (NSRC) Opapo. (Opapo Sugar Research Sub-Station, OSRS). Feb 2001:** Appraisal Exercise on Irrigation Works, Buildings and Other Structures and Electrical Works.
- **Kenya Sugar Authority (KSA) National Sugar Research Center (NSRC) Kibos. Jan 2001:** Appraisal Exercise on Irrigation Works, Buildings and Other Structures and Electrical Works.
- **Symposium on Water Resources and Sanitation Management in Kenya. 2000:** Nyanza Professional Caucus. 11-17 May, 2000. Tom Mboya Labour College, Kisumu. Background research, paper preparation and facilitation.
- **Agrochemical and Food Corporation (ACFC). July 1999 - Dec 1999:** Technical Assessment of the operations of the plant in order to prepare it for privatization with Deloitte and Touche.
- **HR Wallingford (UK) and Smallholder Irrigation Scheme Development Organization (SISDO). May 1999 - Aug 1999:** Documentation on research on of Urban Agriculture in and around Nairobi.
- **Africa Project Development Fund. June- October 1998:** Through Carl Bro(K) Ltd. Ugachick Poultry Breeders Ltd. Kampala. Uganda. Restructuring and Expansion of a Poultry Production and Processing Firm.
- **Second Coffee Improvement Project. Ministry of Co-operative Development/World Bank. January 1998 - May 1998:** Design of Coffee Factories and training of Engineers and supervision of construction of coffee factories.
- **Netcom Information Systems Ltd for Ministry of Research, Technical Training and Technology. Aug 1997:** Analysis of Technology and Products in the Jua Kali Sector.
- **Lake Basin Development Authority. Oct 1996- May 1997:** Design of an Irrigation Weir across Yala River.
- **Kenya Planters' Cooperative Union Limited. Mar 1996- Feb 1997:** Feasibility Study for Estate Sector Rehabilitation. Process and Structural Engineering, Irrigation Engineering, Farm Machinery Engineering, Electrical Engineering, **Environmental Engineering** and Rural Transport Engineering.
- **Dr. Patrick Milimo. February. 1996 - March, 1996:** Design and Engineering Analysis of Soil Conservation Structures, Farm Structures and External Works.
- **Kenya Cooperative Creameries Ltd. 1994 – 1995:** An Examination of Kenya Co-operative Creameries (KCC) Processing Operations and recommendation for

improvement.

- **Water Supply System. February/March, 1994:** Kenya Pipeline Company. Kisumu Terminal. Supervision of the construction of the water supply system.
- **Rural Oil Protein and Production Project. Ministry of Agric/FAO/UNDP/IDA. July - Oct. 1991 and February to August, 1992:** Design/Production Engineering Consultancy. Design, construction and testing of Rural Oil Extraction Machinery
- **Lake Basin Development Authority/African Development Bank. March - July, 1991:** The modalities of Establishing a Tractor hire service in Western Kenya. Machinery selection, sitting and management of the tractor hire service.
- **National Council for Science and Technology. Dec. 1989 - Oct. 1990:** The Status of Information Available on Post-Harvest Technologies in Kenya. Analysis of Postharvest Technology in Kenya and Recommendations for Improvement of the Sector.

Economics:

- **Kenya Wildlife Service. 2010. Midterm review for Mount Kenya East Pilot Project for Natural Resource Management.** Study focused on objectives, achievements, outputs and impacts in relation to overall project interventions.
- **Ministry of Regional Development Authority. 2010.** Preparation of Resource Utilization Charters for Regional Development Authorities.
- **Office of the President. 2010.** Evaluation and determination of effectiveness, efficiency and impact of performance contracting including performance of contract tools and systems and process of implementation.
- **Kenya Sugar Board. 2009.** Impact assessment of SDF funding to the Sugar Industry. All the sugar factories and out grower institutions were assessed.
- **East African Community. 2009/2010: Study on the Informal Cross Border Trade:** This is an ongoing project that involves; undertaking a study of informal cross border trade in the selected border posts, developing an appropriate methodology to capture data, sharing and discussing this methodology for undertaking the study with EAC, Improving questionnaires and indicating other instruments to be used in conducting the study and sharing them with EAC, collecting data on informal cross border trade in the EAC borders, making an analysis of the data including appropriate presentation tools, developing appropriate methodology for future informal cross border trade capture and also indicating ways to reduce or eliminate cross border informal trade
- **African Development Bank. 2010.** Regional Study on the Sustainable Livestock Development in the Greater Horn of Africa. The study was effected in Kenya,

Uganda, Sudan Ethiopia, Somalia, Eritrea and Djibouti.

- **National Agriculture and Livestock Extension Programme (NALEP). 2009. Studies on gender and drugs & substances abuse issues within agricultural sector in Kenya:** The study was a SIDA funded national programme that sought to enhance the contribution of agriculture and livestock to Kenya social-economic development and the realization of the Millennium Development goals (MDGs). The programme was jointly implemented by the Ministry of Agriculture and the Ministry of Livestock Development and covered 148 districts. NALEP targets the urban and peri-urban and rural communities. The general objective of the consultancy was to assess and document the extent, nature and risks associated with abuse of drugs, alcohol and other substances and its impact on productivity, food security, health, nutrition and performance of NALEP staff.
- **AIDS Population and Health Integrated Assistance II (APHIA II) Nyanza Project, Internal Mid-term Review of APHIA II Project Activities. 2009:** The purpose of the exercise was to conduct an internal midterm review of APHIA II Nyanza project in order to provide recommendations for the remaining phase of the project. The specific objectives of the assignment were to: Evaluate the project strategies and determine if the project is on track towards meeting its technical objectives, Assess the operational and management efficiency and effectiveness of the methods and approaches used during implementation, Examine the extent to which APHIA II Nyanza has strengthened relevant government systems such as health management information systems (HMIS), Logistics management, lab networks among others, Assess the relationship with relevant decentralized GoK structures, development partners and other agencies in the region and review the extent to which the project is aligned to GOK policies and guidelines, Evaluate the contribution of APHIA II Nyanza health care systems support strategies in health services expansion and quality improvement, Examine capacity building strategies for Civil Society Organizations including CBOs and Local Implementing Partners (LIPs) and appraise how this has promoted prevention, and community care and support interventions, Review the role of BCC and demand creation strategies in promoting health seeking and services uptake as well as the establishment of effective linkages between communities and the rest of the health care system, Examine synergies between the different sub-components of the project, Assess sustainability strategies APHIA II Nyanza has put in place, Identify and document lessons learnt, implementation challenges, constraints, strengths and weaknesses and provide insights into the future directions for the project
- **South Nyanza Community Development Project: Impact Assessment Survey under the Ministry of Planning and National Development. 2008:** The projects objective was to reduce poverty and improve livelihoods of communities in six districts within the greater South Nyanza i.e. Nyamira, Rachuonyo, Homabay, Migori, Kuria and Suba. The survey was conducted to provide information about verifiable indicators to assess the impact of the intervention in line with project goals, objectives and activities as contained in the project logical framework. The overall project objective was to reduce poverty and improve livelihoods of the rural communities targeting the poor and most vulnerable. The

impact assessment was meant to determine information that would be useful in measuring IFAD's achievements in helping poor rural communities achieve the Millennium Development Goals and more specifically the "eradication of poverty and hunger". Specific tasks effected during the survey included: comprehensive literature review, identification of information needs; developing survey questionnaire; design the survey and methodology; data collection supervision, analysis, processing and presentation

- **Southern Nyanza Community Development Project, Mid-term Review of Project Activities under the Ministry of Planning and National Development. 2008:** The IFAD (International Fund for Agricultural Development) funded study is conducted in Nyamira, Rachuonyo, Homabay, Migori, Kuria and Suba Districts. The overall project objective was to reduce poverty and improve livelihoods of the rural communities targeting the poor and most vulnerable. The study was meant to provide information about verifiable indicators to assess impact of the interventions in line with the project goals, objectives and activities as contained in the project logical framework. Specific tasks effected during the study included: *collection, analysis and documentation of study information* regarding, but not limited to; community empowerment, primary healthcare, agriculture and livestock and domestic water supply.
- **ADRA Kenya: Final Evaluation. 2008:** The purpose of the final evaluation was to assess to what extent the programme objectives have been achieved; the effectiveness of the methods used as well as the cost efficiency. During the study, the consultant used participatory approaches to assess the extent the programmes objectives have been achieved. The consultant also assessed the concepts, methods and approaches of ADRA, the extent to which ADRA is relevant for the development of farmers' organization in Yatta and Mutomo districts in Kenya and how it has contributed to the empowerment of farmers both politically and economically. The consultant prepared a cost-benefit analysis of the programme as regards farmer benefit, sustainable growth and development of farmers' organisations. The consultant also analysed programmes contribution to specific development areas such as equality, HIV and AIDS.
- **Tea Board of Kenya (TBK); National Survey on Factory Processing Capacity Needs for the Tea Industry. 2008.** The overall objective of the survey was to assess the processing capacity needs for the tea industry so as to improve access to processing facilities by: Identifying processing factory needs, proposing appropriate factory models, technology and sizes, proposing policy changes to the licensing criteria of tea manufacturing factories. He specific tasks undertaken include; Analyse production and capacity trends and the intervening input/output relationships, Evaluate and make recommendations on the level and type of technology currently in use in tea processing and on appropriate factory models, sizes and investment options, Propose a monitoring mechanism to ensure that processing capacity is planned to match green leaf production, Propose modalities to optimise the utilisation of existing installed processing capacity, by examining the grower-processor relationship and legal requirements thereto, Make policy proposals to the licensing criteria of tea manufacturing factories.

- **Final Evaluation of Lake Victoria Development Programme (LVDP). 2008:** The purpose of the final evaluation was to assess to what extent the programme objectives had been achieved; the effectiveness of the methods used as well as the cost efficiency. It involved the assessment of concepts, methods and approaches of LVDP, the extent to which LDVP was relevant for the development of farmers' organization in Lake Victoria Basin and how it had contributed to the empowerment of farmers both politically and economically.
- **Ministry of Environment and Natural Resources-Lake Victoria Environmental Management Project II. Preparation of Programme Operational Manual and Handbook. 2007:** The main objective of the project was to; strengthen regional and national institutions for coordination of sustainable management of the transboundary Lake Victoria basin resources, facilitate environmentally friendly investments in the Lake Victoria Basin; and enhance conservation of biodiversity and genetic resources of targeted fish species.
- **Ministry of Regional Development Authorities. Formulation of a Strategy Paper on Sustainability of Regional Development Authorities. 2007:** The main objectives of this project assignment were to; develop sustainability strategies for the Regional Development Authorities in line with the core functions as enshrined in their Acts of Parliament and the proposals contained in the draft Regional Development Policy, and develop short-term tailor made extra-budgetary resource mobilization strategies for specific RDA's depending on their assets and unique characteristics.
- **CARE International in Kenya-Mid-Term Review of LIME Projects. 2007:** This was a project funded by CARE Australia. The Livestock Marketing Enterprise (LIME) Project was a livestock marketing initiative that sought to address the production and marketing constraints that faced pastoralist communities in Garissa District, by creating a sustainable and viable livestock marketing and production system as the basis for increased incomes for households. The goal of the LIME project was to establish a sustainable, socially responsible, and commercially viable, livestock production and marketing model that would be effectively serving 5,000 pastoralists in Garissa district of Kenya. The review was targeted to achieve and determine the project's impact on the targeted community livelihood, and provide opportunities for lessons learnt that will guide the project in future.
- **Ministry of Planning and National Development. Southern Nyanza Community Development Project. 2006:** This project involved Baseline Survey in Nyamira, Rachuonyo, Homabay, Migori, Kuria and Suba Districts. The overall project objective was to reduce poverty and improve livelihoods of the rural communities targeting the poor and most vulnerable. The baseline survey was meant to determine information that would be useful in measuring IFAD's achievements in helping poor rural communities achieve the Millennium Development Goals and more specifically the "eradication of poverty and hunger". The specific task to be effected in this project included collection, analysis and documentation of baseline information regarding, but not limited to: prevalence of child malnutrition which was an indicator of the prevalence of

hunger; household asset ownership as an indicator of household wealth within the project area and indicators like literacy levels, food security, access to safe water, sanitation adequacy, HIV/AIDS awareness and effects, reproductive health, gender equality and community awareness on environmental issues as well as identifying and filling any information gaps that may have existed from previous surveys(RIMS).

- **Office of the President-Ministry of Special Programmes. Arid Lands Resource Management Project. II 2005:** The project involved analysis and Interpretation of Baseline Results Conducted by the Central Bureau of Statistics for the Arid Lands Resource Management Project II. Arid Lands Resource Management Project (ALRMP) is a community-based drought management of the Kenya Government that utilizes a credit facility from the World Bank.
- **Mumias Sugar Company. Sugar Cane Transport and Cane Yard Operations Study. 2005:** The main objective of the project was to identify, study the operations of Mumias Sugar Company and Cane Handling Operations, identify the bottlenecks and propose an improved handling system for handling the sugar cane from the fields to the feed tables. The assignment was in two phases; Phase I-Cane Yard Operations Study and Phase II—Sugar Transportation Study. However due to the interactive nature of the two in sugar production, both phases were being effected simultaneously so as to gain a better understanding of the operations, particularly with regard to cycle-times, which was a useful indicator of the efficiency of the entire sugarcane handling operations (cane transportation and unloading operations)
- **African Wildlife Foundation. Dec 2001 to June 2002:** Baseline Survey Consultancy on the Conservation of Resources Through Enterprise (CORE) including background study research, questionnaire design, field testing of questionnaires, review of questionnaires, field survey, data analysis, report writing and presentation. A total of 167 questionnaires with 1,400 variables were analysed.
- **Commonwealth Regional Health Community Secretariat for East, Central and Southern Africa (CRHCS-ECSA). Dec 2001 to April 2002:** Collation of information and production of a report on the Indigenous foods in East, Central and Southern Africa including identification of indigenous foods, review of climatic and soil requirements and potential for commercial production of indigenous foods, nutritional value of indigenous foods and their role in human health, consumption and utilisation of indigenous foods at household and other levels, processing, preservation and marketing strategies and review of the indigenous foods project.
- **Sterling Craft, Kenya. March 2001:** Diagnostic Study for Expansion and Restructuring of Sterling Craft, Kenya.
- **Poverty Eradication Commission (PEC). UNDP. July - December 2000:**

Social and institutional mapping of all development institutions in the auspices of Government, NGOs, CBOs, Religious and Charitable Organizations in Bureti, Bungoma and Suba districts and urban poverty settlements in Kisumu and Nairobi in Kenya. Specific tasks performed included identification, mapping and evaluation of the development institutions, establishment of whether communities view the organization's as appropriate institutions to assist them in participatory planning and development for poverty eradication, determination of the organizations' competence in poverty eradication ranked by sector (i.e. basic education, healthcare, agriculture, HIV/AIDS, infrastructure, micro-enterprises, etc), determination of the local community's view of the organizations' area of competence ranked sectorally, indication of the organizations' extent or geographical coverage in the district and number of direct beneficiaries of the past and current activities, assessment of the organization's human, financial and infrastructure capacities to assist the local communities in participatory planning and implementations, documentation and evaluation of the organizations demonstrable track record or achievements, transparency and accountability; and conduction of consultations with the district and local administration, local communities to gather information for appropriate strategies and procedures for entering the districts and identification of ways of entry to specific programme/project areas and sites. A total of 650 questionnaires were administered to the 249 development institutions studied.

- **Technoserve Inc. Nov 1999 - Feb 2000:** Impact Assessment of the USAID/REDSO/ESAS Regional Trade Analytic Agenda (RTAA) for Eastern and Southern Africa. The project covered six countries i.e. Kenya, Uganda, Tanzania, Malawi, Zambia and Mozambique.
- **South Nyanza Sugar (SONY) Company Ltd. Kenya Sugar. Authority: Feb-May 1999:** Bid evaluation of the Technical Management Contract of the South Nyanza Sugar Company Limited.

Policy:

- **Kenya Power and Lighting Company 2010:** Development of a strategic plan for the transformation of KPLC Training School to support vision 2030 and beyond.
- **Ministry of Water and irrigation 2010:** The general objective of this assignment is to finalize the Draft Water Storage Policy. It involves reviewing the water storage situation in the country to identify problems, challenges and constraints then prepare the water storage policy in order to accelerate investment in water storage.
- **Kenya Sugar Board: Review Kenya Sugar Industry Strategic Plan 2004-2009 Scope 2009:** The general objective of the review was to prepare a strategic plan to spearhead the sugar industry The review of the sugar industry strategic plan 2004-2009 includes: A review the current strategic plan and other relevant documentation which shall include, but not limited to the National Vision 2030,

the Ministry of Agriculture Strategic Plan 2006-2010, the Sugar Act 2001, Guidelines for the preparation of strategic plans 2008-2010 from the office of the Prime Minister, Ministry of State for Planning, National Development and Vision 2030. and prepare a critique of issues for consideration.

- **Ministry of Water-Resources Management and Development/German Technical Cooperation (GTZ). National Water Sector Master Plan. 2009:** The main objective of this project was to prepare the plan for Kenya based on National Water Services Strategy (NWSS) and National Water Resources Management Strategy (NWRMS) prepared by the Government of Kenya to start the process of implementing reforms in the water sector as spelt out in the Water Act 2003. The investment plan took into consideration various factors including sources of financing, contribution to economic and commercial development, institutional requirements, economic capacity of the people, percentage of population served and health conditions. A financial analysis was effected to establish the commercial viability of a management contract to a Water Services Provider (WSP), the ability of the Government to develop infrastructure through the Water Services Trust Fund and the ability of the Water Resources Management Authority and Water Services Regulatory Board to meet their financial obligations. Recommendations were made on the best way forwards for the sector. The investment plan was to be gazetted in accordance with the requirements of the Water Act 2002.
- **German Development Co-operation (GTZ). 2002:** The Harmonization of the country strategies on water and sanitation services and integrated water resources management with the new water act 2002. Specific tasks include review of strategies, proposal for amendments, development of investment plan and finalization of strategies and investment plan for gazettelement in accordance with the requirements of the Water Act 2002.
- **National Bioenergy Subprogramme. February/March, 1994:** Kenya Forestry Masterplan. Ministry of Environment and Natural Resources. Analysis of bioenergy requirements in Kenya up to 2025.

Assets Valuation and Inventorisation:

- **Agrochemical and Food Company Limited. 2010.** Technical and Environmental due diligence for Transaction Advisory Services for the Privatization of Agro-Chemical and Food Company Limited.
- **Aweil Irrigation Rehabilitation Project; STE assessment of existing Irrigation Machinery and Equipment (Sudan); GTZ/ EU. 2009:** The project involved an assessment of Aweil Rice Scheme, Land development equipment, machinery & accessories lying in the yard, Farm equipment, machinery and their accessories, General maintenance workshop, Power generation units and Rice

Mill; Made inventory of equipment with details of their serviceability and or write off, Prepared a list of essential spares for rehabilitation / repair of machinery and equipment recommended for rehabilitation, Incorporated the views of Rice Scheme technical and administrative department involved in maintenance of various equipment & machinery, prepared specifications for the recommended machinery and equipment, Made recommendations for a mobile maintenance workshop, Assessed staff training needs and recommended training programmes / in-service training as per needs, Made recommendations for minimum mechanization level for land preparation and land development equipment that would reduce labour and with minimal operation and maintenance costs taking into consideration irrigation management transfer, Conducted feedback seminar on the recommended equipment and machinery for AIRP, MoAF, MoAARF, MoW & 1, & MoPI&R, partners institutions and tenants and association representatives for consensus building.

- **Altex EPZ Limited. Inventorization, Valuation and Tagging of Fixed Assets. 2006:** Project on Inventorization, Valuation and Tagging of machinery and equipment in Athi River. The exercise was effected on machines/equipments such as thread overlocks, treasure blind stitch, automatic placket flat locks, J stitch Vibemac, blowers, key hole MCN looper etc.
- **Mini Bakeries Nairobi Limited. Valuation. 2005:** The valuation was conducted on machinery and equipment for bakeries in Nairobi, Nakuru, Kisumu, Meru, Thika, Machakos, Kakamega, Kitale, Eldoret and Karatina. The valuation was done for dough preparation machines, bread baking machines and bread packaging machines.
- **Westmont-Power Project. Plant and Machinery Valuation. 2005:** The plant is located in Mombasa, within the Kenya Authority Premises. The valuation was conducted on combustion turbines, generator and exiter, starting package, inlet air system, exhaust stack, electrical/control package, fire protection system, fuel gas skid, cooler assemblies, barge systems and compressor water wash.
- **Unga Millers (Uganda) Ltd. 2004:** Valuation of plant and machinery including maize milling plant, grain reception and storage facilities and wheat milling plant covering the following processes: intake, weighing, cleaning, drying, milling, sifting and packaging.
- **Kinale Saw Millers. 2004:** Valuation of Saw milling machinery including the gantry cranes, rex, cross cutter, pen, bench and band saws, timber conveyance rollers, workshop machinery, pyrethrum dryer and transport tractors.
- **Greenland Dairy Limited. 2004:** Valuation of milk processing machinery covering the following sections; reception and weighing, cleaning, processing, refrigeration, cleaning in place, laboratory, electrical, steam generation, water supply, effluent treatment as well as office equipment.
- **Everest Enterprises Limited. 2004:** Valuation of horticultural products processing machinery and storage facilities including High Humidity Coolers (HHC) – Cold rooms, Blast Chiller, Water Chiller, Sealers, Water supply,

Transport and material handling machinery, Dipping tanks, Metal detector, Control timers, Spin driers, Over wrapping machines, Insectocutors, Security and Surveillance equipment, office equipment, fittings and computers and maintenance machinery.

- **Aum Maize Millers. 2004:** Valuation of maize milling plant and machinery including intake hopper, bucket and screw conveyors, grain storage silos, de – stoner, sifters, roller mills, hammer mill and power factor correction accessories.
- **Mobil Kisumu Depot. 2004:** Valuation of fuel oil storage tanks and accessories including pipe network, valves, flush points, pressure release points, cat climbing side ladders and fuel loading bay/rank.
- Creation of Fixed Assets Registers including inventorisation, identification of assets of the plant and machinery and affixing identification marks on assets in the following industries:

Allpack Industries Limited, Nairobi. 2003: A packaging material producing industry (corrugated cartons and polypropylene packaging bags).

Frigoken Limited, Nairobi. 2003: A French beans processing industrial plant including packaging and exporting.

Kamyn Industries Limited, Mombasa. 2003: An industry that produces socks, gum boot linings and panty hoses.

Kenya Litho, Nairobi. 2003: A printing and packaging company (Lithography, Flexography and Gravure)

Plastics and Rubber Industries, Nairobi. 2003: A plastic and rubber items producing industry including rubber rings, wheels and oil seals.

Wire Products, Nairobi. 2003: An industry that manufactures nails, chain links, barbed wire, building reinforcement rods and weld mesh.

- **Kenya Chemical and Food Corporation Limited (KCFC). July 2002:** Machinery and equipment **valuation** including power plant, vinegar plant, bakers yeast plant, cooling tower, water treatment and supply accessories, citric acid plant, laboratory control room accessories, anamet treatment plant, boiler house accessories, power house, workshop store yard, furniture and un opened container boxes. All moveable and saleable items were also valued on “ forced sale break-up basis” with *Lloyd Masika*
- **East African Heavy Chemicals (1999) Limited. June 2002:** Machinery and equipment **valuation** for the chemical plant including furnaces, waste heat boiler, sulphuric acid plant, gas coolers, drying tower, product storage tanks, water treatment plant, fuel oil tank, cooling tank, pipe works and fittings, safety

appliances, paintings and insulation materials, compressors, alum plant, pumps, sodium sulphate plant, fire extinguishers and electrical installations and accessories.

- **Aga Khan Health Services, Kenya: April - August 2002:** Inventorisation, Identification and Valuation of assets for the Aga Khan Hospitals in Nairobi, Mombasa and Kisumu. The tasks included making a thorough inspection of the hospitals equipment and machines using the microidentification method, design and affixing identification marks on all machines and equipment, and creation of a fixed assets register by inventorising the equipment and machinery.
- **Industrial Promotion Services (Kenya) Limited. Premier Food Industries. 2001:** Creation of a Fixed Assets Register including Inventorisation of the plant and machinery, Affixing identification marks on assets and Technical assessment of the factory operations.
- **Associates in Rural Development. Technoserve Inc. USAID. 2000 – 2001:** Competitiveness, Investment Opportunities and Risks under Liberalized Trade in East Africa: Case Studies of Agribusiness Firms in Kenya, Uganda and Tanzania
- **Muhoroni Sugar Company (MUSCO). Kenya Sugar Authority (KSA). June-August 2000:** Technical Audit including Valuation of Processing Plant and Machinery, Agricultural Machinery and Equipment, Laboratory Equipment, Water and Sewerage Systems.
- **Kenya Sugar Authority (KSA) National Sugar Research Center (NSRC) Kibos & Opapo (Opapo Sugar Research Sub-Station OSRS). June - July 2000:** Technical evaluation and valuation of the installed irrigation systems including assessment of works, establishing area under drip irrigation and overhead irrigation, and staff evaluation and the valuation of works at both Opapo and Kibos.
- **Ethiopian Privatisation Agency - Tranche III. 2000:** Technical Audit with Ernst & Young including Assets Valuation in Freight and Transportation Enterprise, Construction Enterprise, Agricultural Services Enterprise and the Pharmaceutical Enterprise.
- **Ethiopian Privatization Agency, Coffee Plantation Development Enterprise (CPDE). May 1999 – 2000:** Technical Audit with Deloitte and Touche of 49 Coffee Factories, 3 Cereals plants and Oil Mills including: machinery valuation, technical assessment, staff evaluation and proposal and designs and specifications for refurbishment and rehabilitation.
- **Muhoroni Sugar Company (MUSCO). Kenya Sugar Authority (KSA). 2000:** Technical Audit including Valuation of Processing Plant and Machinery, Agricultural Machinery and Equipment, Laboratory Equipment, Water and Sewerage Systems.
- **Kenya Sugar Authority. June 1998- Jan 1999:** Miwani Sugar Company(1989)

Ltd. Technical Audit of Factory Including: Machinery valuation, structures assessment, process design, evaluation of staff, and proposals for rehabilitation and design.

- **Plys and Panels Ltd. Jun 1996:** Valuation of wood manufacturing machinery.
- **Kenya Tea Development Authority. Feb. - March, 1995:** Valuation and Assessment of Machinery at Kapkatet, Ngere, Kiru, and Mununga Tea Factories. Kericho, Muranga, Kirinyaga.

Training

- **Aga Khan Health Services, Kenya. 2003:** Training of staff on inventorisation and identification of assets using the *micro-identification* method.
- **ADAR Project, Rwanda. Chemonics International. 2002:** Training of Coffee Factory Engineers on Coffee Factory Development and Management including design and preparation of bills of quantities based on the most modern Kenyan design
- **Centre for the Development of Industry. Centre for Development of Enterprise. European Union. 2001:** Training of staff on a project framework for the expansion and restructuring of Sterling Craft, a Kenyan company that manufactures buttons, medallions and trophies for the armed forces in Kenya, a range of gifts and woven labels.
- **Institute of Development, Environment and Agricultural Studies (IDEAS). On the Job Training of Technical Staff. 2000:** The training was carried out in Sudan during the rehabilitation of buildings and infrastructure of the institute in Yambio County, New Sudan.
- **Ministry of Agriculture and Rural Development-Horticulture and Traditional Food Crops Development Project. Irrigation System. 1999:** Training of engineers on how to design an irrigation system using a developed Irrigation Systems Design Course.
- **Ministry of Co-operative Development/World Bank. 1998:** Training of engineers and draughtsmen on coffee processing, engineering graphics, topographic surveys, maintenance management, feasibility studies, factory design, machinery and equipment, water management, water supply, site investigation, bills of quantities, construction management, material selection, mechanical and electrical installation and contract laws.
- **Kenya Pipeline Company Limited. Central Management Services Limited. 1997:** A follow up training for KPC staff on Industrial Maintenance Management Course. Course content included strategic leadership, production planning and control, project management, practical project management, information

management, procurement management, business re-engineering, maintenance management, safety standards and occupation health, total quality management.

The training for technical staff included machinery maintenance, buildings and civil works maintenance, quality assurance and control, management for supervisors, safety and occupation health, stores management, procurement practice, effective driving and road safety and work study for supervisors.

- **Ministry of Research, Technical Training and Technology, Netcom Information Systems Limited. 1997:** Training the ministry on the identification of the sub-sectors critical to the growth of the micro and small enterprise sector in Kenya, determination of growth parameters particular clusters of products, determination of factors constraining growth, the causes and remedies, determination of specific skills upgrading needs of the entrepreneurs and their employees in the identified sub-sectors, and production of a directory of 'Jua Kali' skills up-grading needs.
- **Kenya Pipeline Company Limited. Central Management Services Limited. 1996:** Industrial Maintenance Management Course for the staff of Kenya Pipeline Company Limited. The management training areas included: strategic leadership, production planning and control, project management, practical project management, information management, procurement management, business re-engineering, maintenance management, safety standards and occupation health, total quality management. The training for technical staff included machinery maintenance, buildings and civil works maintenance, quality assurance and control, management for supervisors, safety and occupation health, stores management, procurement practice, effective driving and road safety and work study for supervisors.
- **Second Coffee Improvement Project. Ministry of Co-operative Development/World Bank. October 1990 – 1995:** Design of Coffee Factories and training of Engineers and supervision of construction of coffee factories