

Agricultural Research Department
The Winand Staring Centre for Integrated Land, Soil and Water Research

Report on a cooperation mission to the Kenya Soil Survey

November 1993

E.M.A. Smaling

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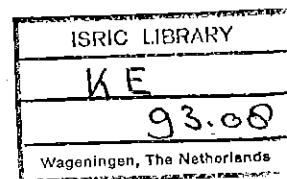
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The DLO Winand Staring Centre is continuing the research of: Institute for Land and Water Management Research (ICW), Institute for Pesticide Research, Environment Division (IOB), Dorschkamp Research Institute for Forestry and Landscape Planning, Division of Landscape Planning (LB), and Soil Survey Institute (STIBOKA).

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Contents	page
1 Introduction	7
2 Activities in the period March-October 1993	9
3 Implementation of NARP-II	13
Itinerary	17

1 Introduction

Between September 21 and October 16, 1993, Dr Ir E.M.A. Smaling of the DLO Winand Staring Centre for Integrated Land, Soil and Water Research (SC-DLO), Wageningen, The Netherlands, paid a working visit to the Kenya Soil Survey (KSS), Nairobi, Kenya. KSS is a section of the National Agricultural Research Laboratories (NARL), which belongs to the group of 15 national research centres in the Kenya Agricultural Research Institute (KARI), in the Ministry of Research, Technical Training and Technology.

Since 1972, KSS is supported through a bilateral agreement between the Government of Kenya (GoK) and the Netherlands Directorate General for International Cooperation in the Netherlands Ministry of Foreign Affairs (DGIS). The cooperation between KSS and SC-DLO is laid down in a Twinning Agreement and an Inception Report, and is supported in The Netherlands by a Project Liaison Unit (PLU). The present phase of support coincides with the first phase of the KARI National Agricultural Research Programme (NARP-I). Reports of previous missions (October 1992; April 1993) are available at KSS and at SC-DLO, Department of International Cooperation.

At the end of 1993, NARP-I will come to an end. During the mission, the attention was largely focused on:

- winding up the KSS project as far as NARP-I is concerned;
- bridging the gap between NARP-I and NARP-II;
- preparing the implementation of NARP-II.

2 Activities in the period March-October 1993

Reporting

The KSS Annual report (1992) has been completed. Copies were sent to DGIS, the Royal Netherlands Embassy (RNE) and PLU members.

The reports on three workshops on Geographic Information Systems (GIS; Nairobi - March 1992, Kwale - September 1992, Kisii - March 1993) are ready for printing and duplication before the end of the year. Printing of the Nairobi workshop is financially taken care of by The Rockefeller Foundation.

A series of KSS reports were completed and printed during the past six months. A complete list will be given in the Final Report on NARP-I. Older KSS reports that went out of stock were retyped and stored on disk.

The DLO Winand Staring Centre representative will compile a Final Report on NARP-I by the end of 1993, listing the expected outputs from the Inception Report, and showing to what extent they were matched. The report will also elaborate on the following achievements:

- completed reports
- hectarage of natural resource surveys
- progress on land evaluation
- progress on geographic information systems
- procured equipment and vehicles
- stocklist of items procured with project funds
- degree training, attended workshops and refresher courses
- achievements of KSS officers in other capacities: CIMMYT-KARI, Cereals Strategic Plan, Bura-Hola Presidential Task Force, Garissa ADC Task Force, KARI Research Policy Prioritization, National Soil and Water Conservation Workshop, Disaster Prevention Workshop, etc.
- other services
- public relations
- research and publications
- contacts with other organizations, (inter)national networking

Brochure

The KSS brochure has been completed. It has become a colourful booklet, which will be instrumental in attracting customers, and boosting the role of KSS in the international soil science community.

Training and workshops

— *Returned:*

- N.M. Achieng and H.C.K. Kinyanjui obtained their BSc. degree from West Virginia University, United States;
- Dr R.M. Kiome returned from East Anglia University, United Kingdom, where he worked on the compilation into research papers of his PhD. thesis.

— *Continued:*

- S.M. Wokabi continued his PhD. studies (ITC Enschede and Gent, Belgium),
- J.R. Rachilo continued his MSc. studies (Gent, Belgium), and J.M. Kibe and F.N. Shitakha continued their BSc. studies (West Virginia University, US).

— *Started:*

- P.F. Okoth started his PhD. studies (Wageningen University), and N.G. Gachini commenced his MSc. studies (Wageningen University).

— *Workshops 1993:*

- Refresher course for KSS staff on the role of soil survey in land use planning (by a staff member from University of Nairobi)
- FAO Soil Correlation Meeting for East and Southern Africa (Nyeri, 1-7 December)
- East African Soil Science Society Meeting (Mwanza, Tanzania, 27 November-3 December)

Dr R.M. Kiome and Mr W.W. Aore have been shortlisted to attend the 1994 International Soil Science Society Congress in Acapulco, Mexico.

Finances

As a result of gross inflation of the Kenyan shilling during the past months, the standing imprest received from RNE has been raised to KSh. 1,000,000/=. New installments are quickly accessible, now that KSS has its own project account. Until October 1993, KSS received KSh. 2,152,086 as far as line item 500 (Operational Costs) is concerned.

KSS laboratories

In a recent national task force, the need for regional soil laboratories was investigated (J. Qureshi, NARL, personal communication). Investments in this respect are likely to be supported by the World Bank, and may alleviate the 'analysis-duration' constraint that has been hitting NARL Agro-Chemistry for some time.

Meanwhile, a mission is still foreseen (1994) on the position of the KSS laboratories in the NARL system, given the partly overlapping facilities of the sections Agro-Chemistry, Fertilizer Use Recommendation Project (FURP), and Irrigation and Drainage Research (IDR). At the moment, the laboratories of KSS do not function optimally. Lack of space and staff are major constraints, followed by

the absence of some (expensive) equipment, which is however present in the FURP and Agro-Chemistry laboratories (auto-analyser, atomic absorption spectrophotometer).

KSS library

Automation of the library was continued and considerably increased the accessibility of available materials. A reference document was issued on all available books and reports (M.O. Aguno, librarian). Further automation will be quite beneficial for KSS and KARI as a whole. In addition, more space is required to put up new, handy shelves, separating journals from books and separating rather old work from recent materials, which may then come out more conspicuously.

Staff situation

KSS management wrote a letter to the KARI Board, indicating (or rather reiterating) the need to beef up KSS as far as staff is concerned. In the project NARP-II document, this has been made a prerequisite in order to achieve set objectives. An alternative may be to merge with the donorless IDR section, which nonetheless includes some excellent staff members.

This is not the first time the staff issue is brought up in these mission reports. Although it is well-understood that KARI has called a ban on recruitments, the DLO Winand Staring Centre representative is convinced that thriving sections such as KSS should be cherished so as to further improve KARI's image to the outside world. Moreover, the services KSS can render on database development and GIS are not confined to soil-related research, but to the entire KARI-mandate research area. Moreover, KSS staff has so far been most cooperative to provide GIS facilities to other KARI Centres.

Transport

A complaint was filed to the Director KARI on the fact that all KARI vehicles have to be repaired in the KARI Workshop. This causes gross inefficiency (filling out local purchase orders for spare parts to be obtained from town, which often turn out not to be the correct ones, or essential parts are lacking, or parts are brought which appeared not to be necessary, etc.). Moreover, the workshop staff members have little experience with Diesel vehicles, and have no incentive to do a good job, as opposed to a commercial garage.

The efficiency of KSS field operations depends highly on the mobility of its fleet. As the business relationship with Waithaka Diesel Shop in Westlands has so far been outstanding and transparent, the author urgently requested the Director KARI to exempt KSS from this new regulation.

Other matters

Staff members P.F. Okoth and F. Ndaraiya worked on the Cereals Strategic Plan, which was discussed and turned into a policy document during the last week of September. Okoth was also involved in the KARI-CIMMYT Maize Database Project. CIMMYT is a well-known international research centre dealing with the genetic and agronomic improvement of maize, triticale and wheat performance, based in Mexico. A workshop on this project was held in Nairobi, and included most KARI Directors of Regional Research Centres and staff from CIMMYT, KARI Headquarters, and Egerton University.

On October 14, Drs. F. de Man (DGIS, Directorate for East and Central Africa) and Dr. R. Bos (RNE) visited KARI/KSS and were given a professional brief by the Director NARL (Dr. F.N. Muchena) on the work done by KSS. They also held talks on the Netherlands support to NARP-II with the Director KARI (Dr. C.G. Ndiritu) and Deputy Director in charge of Livestock Research (Dr. J. Wachira).

3 Implementation of NARP-II

The Netherlands contribution to NARP-II was reformulated in April 1993, and will be subcontracted by DGIS to a still to be selected organization with a mandate that covers most of the Netherlands-supported components. The report as it is will be transformed into a detailed Plan of Operations for 1994-1998. As it may take a few months until the go-ahead on NARP-II will come off, the period January-June 1994 will have to be bridged separately. Interim financing for this period has been granted by DGIS.

Programme briefs

The major goals of the programme in NARP-II are laid down in eight programmes, as listed below.

- 1 Reconnaissance surveys of the districts. Inventories of basic natural resources data by district required for extension recommendations to farmers, land use and management planning and research results extrapolation.
- 2 Semi-detailed soil surveys for project feasibility studies e.g. irrigation development, detailed soil surveys for farm planning or project design and implementation, and site evaluations for project identification.
- 3 Land evaluation. Interpretation for various purposes of the data from 1 (and 2), including for various land management purposes using innovative methods including linkages to farming systems analysis and research.
- 4 Data Base and Geographic Information System. Managing and disseminating the information from programmes 1 and 2 using the database management system and GIS, attractive publications and district workshops.
- 5 Spatial and temporal comparison of intensifying land use with topography, land cover percentage and land degradation in the upper Tana River basin using old and recent air photos and satellite images (1950-1993).
- 6 Relating soil and terrain conditions to conflicting land use types in Narok district (large-scale wheat and barley farming - Masai (semi)nomadism - wildlife).
- 7 To compile a soil and terrain digital database for national and local agricultural planning purposes (KENSOTER; in collaboration with ISRIC and UNEP).
- 8 To build a National Soil Reference Collection and Database (KENASREC; in collaboration with ISRIC).

The actual situation concerning these programmes as per October 1993 is as follows:

Programme 1

The Murang'a District survey is more than halfway (S. Wanjogu, B. Waruru, P. Macharia). A GTZ-executed farm survey was copied to the agro-economist (D. Kilambya) to facilitate his contribution. Completion of the district is foreseen in the first half of 1994.

During the rest of NARP-II, Kajiado, Kirinyaga, Nandi, Lamu and Meru District will be surveyed. Other districts, which have been covered partly in the past, will be completed in the context of programme 4.

Programme 2

Requests from outside for surveys of different magnitude and nature keep coming in and should be generating cash income to KSS.

Programme 3

The programme is led by Dr. R. Kiome. Contributions are obtained from Messrs. Kamoni, Macharia, Kilambya, Ekirapa and Ochieng and Mrs. Nyangesa. Before the end of 1993, a detailed workplan will have been formulated. Meanwhile, Kamoni and Nyangesa continued to collect quantitative information from research stations in the country on crop production obtained under given environmental conditions and input use, in order to build a quantitative land evaluation system.

Programme 4

Workshops in the context of programme 4 are foreseen for Trans Nzoia (March 1994) and Laikipia (October 1994). A refresher mission for the GIS group is foreseen in March 1994, to be conducted by E. Sussenbach of Logisterion Rotterdam, who installed the system in 1991 and gave an introductory training.

The progress by the GIS group is increasingly satisfactory since the deployment of a new Technical Officer (Mr. Owenga) as a database specialist. At the annual Nairobi Agricultural Society of Kenya Show, KARI clinched second price in its category. This was largely due to a highly professional display of the GIS facilities of KSS. Credit goes to P. Maingi, the cartographer of the GIS group. Meanwhile, the number of requests from outside for digitizing work increases rapidly and may become a major source of income for KSS during NARP-II.

Programme 5

Programme leader P.F. Okoth and the DLO Winand Staring Centre representative paid two field visits to sites in Kiambu District that will serve as pilot areas for the programme on environmental degradation in the upper catchment of the Athi-Sabaki river. A remote sensing image of the entire district at a scale of 1:50,000 (thematic mapper, 1988) is available and was chosen to select sites in the tea area, west of Githunguri, the coffee area, near Kiambu town, and the former sisal plantations, having become rangeland area in the far east of the district.

The satellite image clearly shows differences as to land use and degree of sedimentation in the many small lakes in the area. A Wageningen University student did some initial investigations on the relation between land use/land cover and relief in the different pilot areas. Next, air photos of the early sixties and 1978 were available to detect changing land use.

Supervisors of the programme leader (Prof. Fresco, Prof. Molenaar) are scheduled to visit Kenya in February 1994 for fieldwork and discussions. The third supervisor, the DLO Winand Staring Centre staff member and remote sensing specialist Ir G. Nieuwenhuis will combine other duties in Nairobi with a two-day working session with Okoth (November 29-30).

Programme 6

Programme leader W.W. Aore and the DLO Winand Staring Centre representative paid a three-day visit to the entire Narok District (wheat farm areas, Masai livestock areas, wildlife areas, areas of combined/conflicting landuse). The programme leader will finish the land resource survey of Narok District by November 1994. Data will be entered in the database from January 1995 onwards, and maps will be digitized. Contacts will be established with the Netherlands Volunteer Organization (SNV), which will soon embark on an Arid and Semi-Arid Lands (ASAL) project in the district. The envisaged team leader (Mr. van Klinken) successfully started a similar project in Kajiado in the past couple of years.

Programme 7

The ISRIC coordinator (Drs. V.W.P. van Engelen) paid a visit to KSS in August, and conducted fieldwork with the Director NARL (Dr. F.N. Muchena) and the KENSOTER group (P.T. Gicheru and C.R.K. Njoroge) to check on the validity of the KSS soil and terrain information at hand (Exploratory Soil Map, Lake Basin Development Authority Soil Map, Kisii and Transmara Reconnaissance Soil Maps, etc.). The progress of the KENSOTER group is according to schedule and the output looks promising. A next support visit by ISRIC is foreseen in January 1995, whereas the KENSOTER programme leader will be in The Netherlands for consultations around May 1995. P. Owiti was employed on contract basis to assist in data entry and other computer-related jobs.

A project on Land Degradation Assessment was recently initiated by the Netherlands government, UNEP, and the Department of Resource Surveys and Remote Sensing in the Ministry of Planning and National Development. As a result of the sudden funding of KENSOTER from UNEP trust fund sources, this project now seems to partly overlap with KENSOTER. It is suggested to build close links with this new project in order not to reinvent the wheel.

Programme 8

The KENASREC programme will get off the ground in the course of 1994. As soon as funds for NARP-II are officially secured, the workplan can be implemented.

Regional research centres

Collaboration with KARI regional research centres should receive emphasis during NARP-II. The centres in Katumani, Mtwapa and Kakamega also receive Dutch support, and should therefore receive priority in building up linkages. A *modus operandi* still has to be worked out, and should feature in the Plan of Operations for NARP-II.

Itinerary

21-9	10.30 22.30	Departure from Amsterdam (KL 595) Arrival in Nairobi
22-9	mor aft eve	Meeting W.W. Aore (Ag. Head KSS) Meeting with KSS staff, in particular Dr R. Kiome (back from study leave in UK, and in charge of KSS NARP-II programme 3) Meeting P.F. Okoth (KSS) and Dr P. Seward (TSBF)
23-9	mor aft eve	Meeting Dr B. Ngundo (Ass. Director KARI, Soils, Water and Other Resources); Attending Maize Database Workshop (CIMMIT-KARI Project) Meeting Dr Herrlocker (GTZ) and Mr Shabaani (Ministry of Agriculture and Livestock Development) on digitizing Range Management Handbook maps; Meeting GIS team (KSS NARP-II programme 4) Editing KSS reports and scientific papers
24-9	mor aft	Meeting Dr C. Ndiritu (Director KARI); Meeting Dr F. Muchena (Director NARL); Meeting Dr H. Bruijn (Ben Gurion University), Dr M. Rutten (Wageningen Agricultural University) and F. Ndaraiya (KSS) on collaboration in Netherlands-Israel Research Programme Attending Maize Database Workshop; Meeting W.W. Aore; reporting
25-9		Reporting
26-9		Meeting Dr P. Seward and Mr S. Nandwa on nutrient monitoring project proposal
27-9		Meeting KSS staff (Laboratories, Library, Reproduction) and KENSOTER project (Gicheru, Njoroge); reporting
28-9	mor aft eve	Preparing Plan of Operations NARP-II Fieldtrip to Kiambu District (programme 6) Meeting with NARL staff on KARI's Cereals Strategic Plan
29-9	mor aft	Meeting W.W. Aore Meeting Seward/Nandwa on nutrient monitoring
30-9	mor	Meeting Dr A. Pieper (Chef de Poste, RNE), F. Smiet (First Secretary, in charge of Environment), A. Linden (Gender

		Issues)
	aft	Meeting KSS staff; preparing workplans and budgets 1994-1998
1-10	mor	Meeting Dr. J. Lynam (Rockefeller Foundation) on nutrient monitoring project proposal; visit to the Nairobi Agricultural Show
	aft	Meeting KSS staff; preparing workplans and budgets 1994-1998
	eve	Dinner at Dr. Muchena's residence
2-10		Reporting; drafting nutrient monitoring project
4-10	mor	Meeting KSS staff
	aft	Visit to research area P.F. Okoth (Kiambu District) to contribute to KSS NARP-II programme 5
5-10	mor	Meeting KSS staff
	aft	Travel Nairobi-Narok
6,7-10		Visit to research area W.W. Aore (Narok District) to contribute to KSS NARP-II programme 6
8-10	mor	Travel Narok-Nakuru-Nairobi
	aft	Meeting Nandwa/Seward on nutrient monitoring project
9-10 to 14-10		Local leave
15-10		Round-up: Debriefing Dr Ndiritu, Ngundo, Muchena, Mr Aore; Meeting KSS staff Wanjogu/Waruru/Macharia (programme 1) and Kiome/Kamoni/Kilambya/Ekirapa (programme 3)
	eve	Happy hour
16-10	mor	Meeting Dr. R. Bos (RNE, First Secretary)
17-10	00.30	Departure Nairobi (KL 595)
	07.30	Arrival Amsterdam