

“HANDS ON” TRAINING FOR RESPONSE FARMING

Reactions to calls for information collection and exchange

Kees Stigter (INSAM)

Version 1 (June 2008)

In early April 2008, I wrote the note below to members of INSAM and participants in the FAO/WMO Agromet-L e-mail list. It was subsequently taken over in the Global Farmer Field School Listserve (Global-FFS-I), which has been launched as part of the Global Farmer Field School Network and Resource Centre (FFSnet).

The original text was:

“I am too frequently getting letters from students in the developing world who are desperately looking for training in more practical subjects. Subjects in crop, soil and harvest protection as well as in crop, water, land and microclimate management and manipulation for improved yields. In short: training in assisting in response farming. Preferably with a social bottom up approach component. Because it is clear that poverty alleviation demands this.

A new consciousness of the problems of the human environment, strengthened by increasing climatological and weather disasters, has brought a new generation of students to despair. However, agrometeorologists (and not only we) have presently insufficient applied scientific training to offer to cover those growing needs.

There is sufficient training in basic sciences and in methods and skills to understand processes that go on in the production environment. But there is insufficient training in the application of this knowledge to problem solving in endangered environments. Insufficient training for the development of what we have called for a decade now responses with "agrometeorological services for farmers", as far as our own field of work is concerned. But the same applies in the neighboring and overlapping fields of applied science.

INSAM would very much like to create a catalogue of places where such training is given or where they want to establish such training by trial and error. Forget centers of excellence if they can't contribute to solve the actual problems of farmer communities and to influence poverty alleviation.

Please mail me (cjstigter@usa.net) about what exists in your institutes or what you plan to establish in the above context. We can then better reply to the requests for such training that we receive and we can make, and annually update, a catalogue of such training facilities that really could make a difference in the life of farmers. They struggle daily to use their environments most appropriately and to defend themselves against environmental hazards. They need institutionalized and structural help. People need scientifically backed training to deliver such assistance”.

Until the last week of June, I received 27 reactions, of which 20 contained information that was worth to show and discuss in a first version of a small catalogue on “hands on” training for response farming. Other reactions were encouragements and suggestions, some indicating that such training was not available from where these reactions came from but that the need for it was high, some suggesting also to cover the demand side.

Two major problems were to be expected, that of language and that of funds. With one exception, reactions received were all on English language training facilities, while they must exist in other major languages as well, but our calls were mainly received by English language colleagues. However, the first example below, from Niger, West Africa, is on a pack of courses in French only.

We invite with emphasis other than English language training institutes to submit material as well, as long as we have a good idea of the contents. We will test this by showing it to others within that language field.

Funds are a serious problem for all training facilities, but on the other hand funds for training are often made available locally. As a near future policy issue, we may expect increasing funds for capacity building of all kinds in agrometeorology as well. We have not looked at funding matters as such. Where information was provided, it has been included.

The distribution of the material has been chosen to be given in a regional way. That means that we have basically sections for the six Regions Africa, Asia, South America, North and Central America, South-West Pacific and Europe, in the sequence also used by WMO.

Within each of these Regions, we have indicated the countries from which the information came alphabetically. For each country we have used a chronological sequence. Material that came in first is shown first.

We are convinced that there is much more information material available on this kind of training facilities. We encourage readers of this modest first compilation to send more of such material for future updates of this first version.

With thanks to the contributors in this first version and thanks in advance for any additions, Kees Stigter

AFRICA

Niger

(submitted on 7/4/'08 with additions on 23/6/'08)

The point raised in your message is of utmost importance. The application of agrometeorology to agriculture is of utmost importance. It has widespread applications ranging from crop phenological monitoring, crop-water balance and rainfall estimation to yield prediction and monitoring and or prediction of pest outbreaks. I have had the chance of heading the Training and Research Department of the AGRHYMET Regional Centre (ARC) in Niamey, Niger, where these applications are taught to students at two levels: Higher Certificate (Technicien Supérieur) and 'Ingénieur' levels. The ARC is a specialized institute of the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS), an intergovernmental organisation with a mandate in food security and natural resource management. All courses are in French.

You can find out more about the training and research conducted at ARC, also in the English language, by visiting the following web sites and/or contacting the following people:

Web Sites:

WWW.AGRHYMET.NE
WWW.CILSS.BF

People to contact:

Admin@agrhyet.ne
E.Sarr@agrhyet.ne
B.Sarr@agrhyet.ne
F.Gnoumou@agrhyet.ne
S.Traore@agrhyet.ne

If necessary, I am available to give you more information.

Sankung B. Sagnia
FAO/Kinshasa
Tél.: (243) 81 004 8439
E-mail: Sankung.Sagnia@fao.org

An example is given below. Several brochures are available on request.



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Les dates indiquées sont susceptibles de modification

Intitulé	Date rentrée	Frais Inscription
Mastère en Gestion Concertée des Ressources Naturelles: option Gestion Intégrée des Ressources en Eau	Juin 2008	2.000.000 cfa/an/participant
Techniciens Supérieurs en Hydrologie	Octobre 2008	2.000.000 cfa/an/participant
Techniciens Supérieurs en Protection des Végétaux	Octobre 2008	2.000.000 cfa/an/participant
Techniciens Supérieurs en Instruments et micro-informatique	Octobre 2008	2.000.000 cfa/an/participant
Ingénieurs en Protection des Végétaux	Octobre 2008	2.000.000 cfa/an/participant
Mastère en Protection Durable des Cultures et de l'environnement	Bientôt	2.000.000 cfa/an/participant

La clôture des inscriptions aux cycles Technicien Supérieur et Ingénieur est fixée au 20 septembre 2008

LES FORMATIONS CONTINUES

Les dates indiquées sont susceptibles de modification

Intitulé Modules Spécialisés	Dates	Frais inscription
Changement climatique et développement Durable (3 mois)	Octobre 2008	500.000 cfa/mois/participant
Production et Protection des semences conventionnelles et transgéniques (3 mois)	Octobre 2008	500.000 cfa/mois participant
SIG et Télédétection (2 à 3 semaines)	continue	450.000 cfa/participant

Le niveau de recrutement est le Bac scientifique pour les cycles des Techniciens Supérieurs, le DUT ou équivalent pour les cycles ingénieurs et la maîtrise ou équivalent pour le Mastère. Le CRA délivre des attestations de pré-inscription aux candidats qui le désirent pour la recherche de financement.

- Quelques Organismes pour la demande d'une Bourse..
- Services de bourse des états
 - Organismes Internationaux
 - Agences de Coopération et Missions diplomatiques
 - Fondations et Organisations Non Gouvernementales



Pour plus d'informations, contactez
 Centre AGRHYMET, BP 11011, Niamey, Niger
 Tél + 227 20315316 / fax + 227 20315435
 Mail : E-San@agrhy.net / Gnoussou@agrhy.net
admin@agrhy.net



AGRHYMET: c'est aussi une expertise confirmée pour toutes vos formations à la carte en Sécurité Alimentaire et Gestion des Ressources Naturelles. Lutte contre la Désertification

AFRICA

Nigeria

(submitted on 3/4/'08)

Thanks for your timely mail on this subject. I have just been appointed Director of the Agricultural Media Resources and Extension Centre of the University of Agriculture, Abeokuta, Nigeria. This issue of training with regard to natural resources management for stakeholders in agriculture, particularly development of coping strategies for farmers, is of paramount interest to me. A foremost scientist recently captured it as 'the need to break the vicious cycle of natural resource degradation in the tropics'. Our farmers need to know how to cope with variations in nature and become more aware about climate change.

I'm hoping our University Centre can develop training programs on soil and climate variability with the aim of letting farmers understand that they can cope positively with variation in nature if they understand the nature of the variations. It is also believed that with proper packaging, promising technologies for sustainable management of soil and water can be adopted by farmers in view of present-day constraints against expansion of agricultural lands. I shall be glad to receive further advice from you.

Prof. F. K. Salako
Department of Soil Science and Land Management
University of Agriculture
PMB 2240, Abeokuta, Nigeria
kolawole salako <kfsalako@yahoo.ie>
Additional E-mail: kolawolesalako@hotmail.com
fsalako@ictp.it

AFRICA

South Africa

(submitted on 23/6/'08)

The University of the Free State (Bloemfontein), Department of Soil, Crop and Climate Sciences, Division of Agricultural Meteorology, offers the following special course. Below are its 2007 contents.

AGROMETEOROLOGY HONOURS

LWR 603/2007

METHODS USED IN AGROMET COMMUNITY RESEARCH

This course will be self-study. One meeting will be held each week to discuss the assignments covered during the previous week.

The student must prepare for these sessions by reading the material and working out answers to the questions.

Each student must also search for at least one extra scientific article or reference on the same topic and bring it to the discussion session.

There will be at least two semester tests and selected assignments will be handed in for grading.

More information on such courses and relevant applied M.Sc.- and Ph.D.- subjects from

Prof. Sue Walker

walkers.sci@ufs.ac.za

METHODS USED IN AGROMET COMMUNITY RESEARCH

1. Qualitative vs Quantitative Research
2. Participatory Rural Appraisal
3. Relationships
4. Farming Systems Research and Extension
5. Grounded Theory
6. Action Research Method
7. Monitoring and Evaluation Method
8. Communication Models
9. Dissemination Models
10. Early Warning Systems
11. Agromet Intermediaries
12. Use of Models in the Community
13. FARMSCAPES example
14. Florida Consortium example

Further details on each of these subjects from

Prof. Sue Walker

walkers.sci@ufs.ac.za

AFRICA

Zimbabwe

(submitted on 9/4/'08)

In response to your email, I wish to inform everyone interested that at the University of Zimbabwe we have set up an Agricultural Meteorology research group that is striving to address this problem of insufficient applications in agrometeorology. We boast of a very well-equipped laboratory with up to date instruments and equipment, including plant water potential meter, dendrometers for stem and fruit growth, porometers, a range of soil moisture sensors, IR gas analyzer, leaf temperature sensors, leaf wetness sensors, sap flow gauges, Sunscan Ceptometer and the leaf area meter and a range of micrometeorological sensors and data loggers. We have, in pursuit of this desire to close the gap, run workshops and seminars where the modern agrometeorological techniques and applications are demonstrated to farmers, researchers and other stakeholders. We have also established the University climatological station and a demonstration site where such demonstrations and trials can take place. We have over the years done extensive consultancy and extension work in agrometeorology in such fields as sugar industry, mostly located in dry semi-arid areas; citrus estates, and maize producers, in the areas of irrigation scheduling and techniques and greenhouse production in the area of greenhouse climate control.

Although, this is still a growing group, we do believe that we have the capacity to offer such training in practical subjects in the field of agrometeorology, particularly for farmers and other practitioners.

I have attached here a document that summarizes our activities.

Enquiries by e-mail are welcomed by

magm@science.uz.ac.zw, chipindu@science.uz.ac.zw,
emash@science.uz.ac.zw, or tmhizha@science.uz.ac.zw

Emmanuel Mashonjowa (for Agricultural Meteorology Group, UZ)

UNIVERSITY OF ZIMBABWE
PHYSICS DEPARTMENT
AGRICULTURAL METEOROLOGY RESEARCH GROUP

Main lines of research and training:

Research:

- Agricultural Meteorology covers all aspects of the application of meteorological science and climatology to all aspects of agriculture, including forestry
- Soil water balances and water use
- Microclimate, including that within mixed cropping and agro forestry
- Animal housing and controlled environments
- Agrometeorological experiments and instrumentation
- Agroecological zoning
- Agrometeorological hazards - frost, floods, drought etc
- Crop-weather modelling and crop production forecasts
- Conditions for storing and transporting produce
- Pest and disease forecasting, and conditions for control measures
- Climate change impacts: effects of agriculture on climate
- Forest meteorology
- Meteorological forecasts for agriculture, on all time scales
- Agrometeorological services, information systems and databases

Training: MSc and DPhil

Major scientific results:

- Agro-ecological zoning
- Crop - weather forecasting
- Drought and desertification
- Use of remote sensing in catchment water balances
- Environmental effects on cattle behaviour
- Non-destructive assessment of crop growth
- Measurement of transpiration by fruit trees
- Greenhouse microclimate

Facilities available:

Library resource, Computer laboratory with software packages and climatic database, Open air sites on the roof of the Physics department. Instruments include plant water potential meter, dendrometers for stem and fruit growth, porometers, a range of soil moisture sensors, IR gas analyzer, leaf temperature sensors, leaf wetness sensor, sap flow gauges, Sunscan Ceptometer and the leaf area meter and a range of micrometeorological sensors and data loggers. The University climatological station and a demonstration site where the modern agrometeorological techniques and applications are demonstrated to farmers and other practitioners. We also run workshops and seminars on these aspects.

Future development:

Provision of technical assistance and consultancy to various agricultural institutions, research bodies and individual farming organizations, a calibration laboratory for soil-plant-atmosphere interaction measurement instruments. Supply of agro-meteorological data for research and planning.

Cooperation with developing countries (present and planned):

The Agricultural meteorology program is a regionally recognized programme that has provided training for students from various SADC countries.

Other international cooperation arrangements (present and planned) including major donors if any:

Students' support, computing equipment and specialized instrumentation for laboratory and field use has largely been supplied through the Belgian government, and a link with the Flemish Interuniversity Council. Input is also obtained from the Ghent University and Katholiek University of Leuven, Belgium; University of Reading, UK and Max Planck Institute for Chemistry, Germany.

CONTACT:

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University of Zimbabwe
P O Box MP 167, Mount Pleasant
Harare, Zimbabwe
Tel: (+263)4 303211 (Ext 1417) Fax: (+263)4 307156/ 333407 / 333529

Enquiries by e-mail are welcomed by
magm@science.uz.ac.zw, chipindu@science.uz.ac.zw,
emash@science.uz.ac.zw, or tmhizha@science.uz.ac.zw

On behalf of INSAM, I commented as follows:

many thanks for this valuable information.

Prof. James Milford and Dr. Barney Chipindu have told me from these experiences before. It is of course not about the equipment but on how it was used to solve farmers' problems with agrometeorological components.

I have read some of the results (from Dr. Raes et al., I think) but I would very much like to have more examples of the results in writing.

Perhaps our greatest mistakes in these “hands on” training exercises is that we do not go through the additional efforts of publishing the results of the research components of such trainings, in local journals or otherwise.

My TTMI/African Network project and (admittedly to a lesser extent) my Asian Picnic Model project have always tried to publish results in scientific but also in "hands on" journals (such as the LEISA Magazine, formerly ILEIA Newsletter).

Our collection of good examples of "Agrometeorological Services" for INSAM serves this same purpose, because others can use these examples directly in their own work. In our new INSAM journal "Operational and Educational Agrometeorology" we will do the same as well as on the INSAM website ("Accounts of operational agrometeorology" etc.).

These experiences should not get lost and can be started from by others. It will be one of the issues we recommend here on practical training. Would you have examples available? INSAM would love to disseminate these results.

Asia

India

(submitted on 3/04/'08)

We too feel that such trainings are needed.

I think we at Anand can take up such training programs.

You are aware that our International Symposium at CRIDA, Hyderabad was a great success. It was the first event in the history of CRIDA. We are planning to have National Seminar at Anand during November 2008 on

"Agrometeorological Services to Farmers".

Your guidelines and suggestions are most welcome.

Dr. Vyas Pandey

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Secretary, Association of Agrometeorologists

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Mobile:919879912357

Alternate email: vpandey@aau.in

Asia

India

(submitted on 4/04/'08)

This is in response to your recent INSAM message on the growing demand of training facilities in more practical subjects from the developing countries.

You may kindly remember that during the CAgM intersessional period of 1995-1999 (during the last phase of your tenure of the office as President of CAgM), I was assigned by WMO to conduct roving seminars on 'Agrometeorology related to Extreme Events' and for that matter I was requested to prepare (i) a Training Manual and (ii) a practical Workbook as a consultant on the above mentioned topic for using these materials as guides in the roving seminars. Subsequently I prepared these two guides and conducted roving seminars in India and Ethiopia (each 3 weeks duration).

Now, as I read your message on the demands of training courses in more practical subjects; I feel that the contents of the practical Workbook (complemented by the training Manual) may be considered, still now, as useful materials in conducting such type of seminars like Agricultural disaster management, Extreme Agrometeorological Events etc.

The practical Workbook referred above comprised 11 Chapters containing practical training materials that have been used in problem solving Exercises. This Workbook contains a good number of Exercises on each Chapter along with their detailed step by step solutions. Even the Workbook may easily be updated with social bottom up approach and with topics like response farming in uncertain weather conditions.

I attach herewith the contents of the practical Workbook for your expert comprehension.

As I do not have any affiliation to any Institute or Department, I can organize this type of practical oriented training courses single-handedly wherever these courses are required to be organized.

With kindest regards,
Dr. H.P. Das, Pune, India

E-mail address: hpd_ag@rediffmail.com

Contents of Dr. Das' Practical Workbook on 'Agrometeorology related to Extreme Events.

CHAPTER -1

Exercise 1.1	Rainfall frequency analysis	(2 Problems)
Exercise 1.2	Rainfall probability analysis	(2 Problems)
Exercise 1.3	Intensity-frequency-duration Analysis of rainfall	(3 Problems)
Exercise 1.4	Depth –duration and depth – area – duration analysis of rainfall	(4 Problems)
Answer to all the Exercises		

CHAPTER -2

Exercise 2.1	Return period of heavy rainfall/floods	(3 Problems)
Exercise 2.2	Return period of drought	(2 Problems)
Answer to all the Exercises		

CHAPTER-3

Exercise 3.1	Meteorological Indices relating to Drought monitoring and aridity shift	(4 Problems)
Exercise 3.2	Control measures against desert- encroachment	(2 Problems)
Answer to all the Exercises		

CHAPTER – 4

Exercise 4.1	Residual mass curve	(1 Problem)
Exercise 4.2	Palmer's drought Index	(2 Problems)
Answer to all the Exercises		

CHAPTER – 5

Exercise 5.1	Markov chain model	(5 Problems)
Answer to all the Exercises		

CHAPTER – 6

Exercise 6.1	Evaluation of damage due to Tropical storm/Hail storm	(2 Problems)
Answer to all the Exercises		

CHAPTER – 7

Exercise 7.1	Climatic conditions favorable to outbreak of pest and disease	(7 Problems)
Exercise 7.2	Animal performance in relation to weather	(2 Problems)
Answer to all the Exercises		

CHAPTER – 8

Exercise 8.1	Assessment of water erosion and wind erosion	(2 Problems)
Exercise 8.2	Assessment of soil loss by universal Soil loss equation	(2 Problems)
Answer to all the Exercises		

CHAPTER – 9

Exercise 9.1	Assessment of water level due to recharge	(3 Problems)
Exercise 9.2	Assessment of salinization	(1 Problem)
Answer to all the Exercises		

CHAPTER – 10

Exercise 10.1	Threshold for forest fire ratings	(3 Problems)
Answer to all the Exercises		

CHAPTER – 11

Exercise 11.1	Irrigation scheduling and requirement	(5 Problems)
Exercise 11.2	Leaching requirement	(1 Problem)
Answer to all the Exercises		

Asia

India

(submitted on 4/04/'08, with additional correspondence on 8/04 and 16/04)

As intimated to me by Dr. L.S. Rathore, Head, Agrimet, I would like to respond to your query regarding practical oriented agrometeorological training programme.

You might be aware of that Agricultural Meteorology Division (at Pune) of India Meteorological Department works as a part of RMTC (Regional Meteorological Training Centre) of WMO. As per approved academic calendar, the Training Unit of the Division is offering Foreign Trainees' course since long back. So far, 97 candidates have been trained through the course from various countries *viz.* Nigeria, Tanzania, Ethiopia, Sudan, Philippines, Uganda, Malaysia, Kenya, Ghana, Nepal, Madagascar, Mongolia, Afghanistan, Mauritius, Oman, Syria, Myanmar, Yemen and Zambia.

The course duration is six months and is conducted twice a year with effect from 1st January and 1st July (as and when demand comes). The qualification required is B.Sc. (preferably in agriculture). The candidates (from WMO member countries only) should route their application through WMO. The course content includes basic as well as operational agrometeorology, which can ultimately serve the end users requirement, as resource persons in various agrometeorological/agricultural fields are available.

In addition, in future, if specific demand comes we can plan for short term courses as per requirement.

With kind regards,

Dr. A. Kashyapi,
Agrimet Division,
India Meteorological Department, Pune, India
E-mail address: kashyapi_a@yahoo.co.in; lsrathore@ncmrwf.gov.in

On behalf of INSAM I replied:

Dear Dr. Kashyapi,

many thanks for that information. Could you please be so kind to extend this information with examples of the type of training in operational agrometeorology that ultimately served the end users requirements in the training of the people mentioned from the countries listed. Because that is what would make the difference, not the basic training given.

Dr. Kashyapi replied:

We don't have as such any feedback from the participants of different countries regarding how best they are utilizing their operational agrometeorological knowledge to serve end users need. However, in India, we have framed different courses on basic and operational agrometeorology to support agrometeorological advisory services for the benefit of farmers. These training programmes are focused on human resource development towards better agrometeorological advisory generation, which will ultimately serve end users requirement. However, exact evaluation about how far it will serve end users need, will take some more time, but constant efforts are there to serve end users needs.

I replied again with:

I appreciate your additional information and statements. Perhaps our greatest mistakes in these hands on training exercises is that we do not go through the additional efforts of publishing the results of the research components of such trainings, in local journals or otherwise.

My TTMI/AN project and (admittedly to a lesser extent) my Asian Picnic Model project have always tried to publish results in scientific but also in "hands on" journals (such as the LEISA Magazine, formerly ILEIA Newsletter).

Our collection of good examples of "Agrometeorological Services" for INSAM serves this same purpose, because others can use these examples directly in their own work. In our new INSAM journal "Operational and Educational Agrometeorology" we will do the same as well as on the INSAM website ("Accounts of operational agrometeorology" etc.).

These experiences should not get lost and can be started from by others. It will be one of the issues we will recommend in our new list/catalogue on practical training. Dr. Murthy has also tried this in India and some of his work got

beyond that stage into publishing. For example CASAM (Prof. Varshneya at the time) did this in local journals in India but not so much beyond that. INSAM would love to disseminate these results.

To which Dr. Kashyapi replied:

Many thanks for your kind advice. We will go through the references cited by you. We have already incorporated practical trainings in our training programs. Publishing part is so far neglected. However, in future we will take care of that aspect to enrich our training content. We will wait for your advice from time to time.

Asia

India

(submitted on 6/04/'08)

Thank you once again for the kind mail on “TRAINING” in our science of agrometeorology. Your observations on the subject of “Training” with valuable experience behind you are most worthy to be adopted. Coming to the facilities that I have developed in Acharya NG Ranga Agricultural University, please find attachments as “TRAININGINSAM” and “Field experiment”. The file on field experiment indicates my current topic of interest.

Through this mail I assure the best of my contributions and services (whatever little that I know) in “TRAINING” component of the agrometeorology by individuals/organizations at Local/National/Regional/Global level.

V.R.K. Murthy, ANGRAU, Hyderabad, India

E-mail address: vrkmurthy11@hotmail.com

TRAINING FACILITIES ON AGROMET AT ANGRAU, HYDERABAD

I. Location and contact address of contact person: Dr. V. Radha Krishna Murthy, Associate professor, Department of Agronomy, College of Agriculture, Rajendranagar, Hyderabad, Andhra Pradesh, India PIN: 500 030. Telephone +91 40 24015011 Ext: 362. E-mail ID vrkmurthy11@hotmail.com.

II. Facilities available:

Training facilities for persons from underdeveloped, SAARC and developing countries.

A). Agrometeorological laboratory: This is a laboratory and not a open meteorological observatory. The equipment available include

- a) Solar radiation: Pyrano-albedo meter, pyranometers, sensors to measure components like UV, light, IR, Net radiation etc.
- b) Temperature : Instruments to measure air and soil temperature like maximum and minimum thermometers, thermographs, soil thermometers, infrared-thermometers etc.
- c) Humidity: All sensors using sensitive elements like hair, expansion, dry and wet bulbs, recording type etc.
- d) Pressure: As detailed under Humidity.
- e) Wind: As detailed under humidity.
- f) Rainfall: Symons, Self recording, Tipping bucket rain gauges etc.
- g) Evaporation: UAWB open-pan, Sunken screen evaporimeters etc.

This laboratory has the state of laminated diagrams on all agromet instruments, cloud atlas, effect of weather on crops/ animals, energy balance studies. Many scientists working in India rated these diagrams as the BEST ones that they ever saw.

B) Books available for reference:

- a) Excellent books written by Dr. MVK Sivakumar and a few copies of his valuable research articles.
- b) A book as also scientific reports on TTMI project of Dr.CJ Stigter.
- c) Books written by me Viz.,
 1. Practical manual on Agricultural Meteorology
 2. Terminology on Agricultural Meteorology
 3. Basic Principles of Agricultural Meteorology
 4. Terminology on Agronomy and Agricultural Meteorology
 5. Indigenous rain forecasting in Andhra Pradesh.

Training facilities for persons from developed countries: IN ADDITION TO THE ABOVE

1.I have very good scientific links with National Remote Sensing Agency's Laboratory, India Meteorological Department's surface and radar observatory, access to few facilities at ICRISAT Etc. I assure that these facilities may be provided on request.

2. The city of Hyderabad has the BEST IN THE WORLD software developing companies and facilities.

3. I have very good association with an Instrumentation Company that develops all agromet instruments.

4. Private companies offer trainings on RS and GIS applications.

III. Resource personnel:

Excellent resource personnel in the fields of agroclimatology, agromet instrumentation, micrometeorology, statistical climatology above all the most renowned scientists in general meteorology are available.

IV. Reasons why any one must prefer for training in Hyderabad at my laboratory:

Andhra Pradesh has one of the most variable rainfalls of any state in the country. Climate is a major factor affecting the profitability of rural enterprises in the state. It has three well defined seasons: Monsoon (rainy) Winter and summer. Typically different agricultural crops viz., cereals (more than 10), pulses (6), oilseeds (8) commercial (7) vegetables (more than 10) are grown round the year. Also, animal rearing, poultry etc. are available to learn the influence of weather on them.

V. The people and culture: Click any web site and one finds the best of ancient structures, facilities, wonderful culture, humans with highly respected values with great and unparalled traditions.

VI. Training duration, fees etc: Any time in a year. Fees etc., will be decided by the University and it will be most suited to the purse of economically very poor students also. Hostel facilities are available in my University that include lodging and boarding.

VII. My personal request: Those who are interested to come for training shall come for learning and not just to spend time. They should have proper code of conduct and decent behaviour.

FIELD EXERCISE ON “ MURTHY’S DAILY WEATHER- AGRICULTURE”

1. Aim: To test the agrometeorological tool “MURTHY’S DAILY WEATHER- AGRICULTURE” at field level with a farmer’s group in a village.

2. Objectives:

A) To make farmers become more self reliant in dealing with weather and climate issues as the same affect agricultural production on their farms.

B) To secure farmer self reliance, through helping them better informed about effective weather / climate risk management by sustainable use of natural resources for agricultural production.

3. Relevant information:

The State of Andhra Pradesh is 4th largest of Indian States in geographical area and 5th largest in terms of population. This state enjoys a position of “EXCELLENCE” in respect of agricultural crop production as over 70 % of total population (85.7 million) depend on agriculture shedding their energy and time for their own livelihood and for humanity. Even though the climate of this State is diversified the agriculture sector is strongly driven by the monsoon behavior. The reason is that the rainfall (vary largely inter and intra annually) as also the weather (risks and uncertainties) in this State is influenced by both South West and North monsoons. The normal rainfall of the State is 940mm of which major portion (68.5%) is contributed by South-west monsoon (June-September) followed by North-East monsoon (22.3%) from October to December. The rest of 9.2% rainfall is received during the winter and Summer months. The rainfall distribution of the state differs with season and monsoon. The influence of South West monsoon is predominant in Telangana region (714mm) followed by Coastal Andhra (620mm) and Rayalaseema (407mm). The North-East monsoon provides high amount of rainfall in Coastal Andhra (324mm) followed by Rayalaseema (238mm) and Telangana (129mm). The above information clearly indicates that the farmers and farming depend greatly on monsoon behaviour, which is highly varying both inter and intra annually. It is essential that the farmer must be educated on weather and climate to perform their farm operations based on monsoon behaviour.

The village Sidderamapuram in Ananthapur District now selected for field experiment is basically an agricultural village. There are 457 families that depend entirely on agriculture for their livelihood. The crops grown are paddy, groundnut , vegetables, orchard crops and farmers rear animals for milk etc.

4. Material required: a). Previous 30 days news paper cuttings with information on weather b) A traditional almanac locally followed by the farmers c) Relevant information on effect of weather/ climate on crops, agricultural operations and animals (Preparation of this information specific to the village/s takes lot of time and you need to translate the information from English language into local language. Please prepare at least 20 A4 size pages of information. (Examples: Four days of continuous cloudiness results in attack of paddy stem borer. Drying of groundnuts in sun results in eradication of aflatoxins. Animals and harvested crop produce must be moved to safer places today itself due to heavy rains anticipated because of cyclone for the next two days as at present there is a depression in Bay of Bengal which is likely to intensify further from today noon. Spray fungicide only late in the evenings against the color rot of groundnut and on vegetable crops because the temperatures are likely to increase beyond 36 centigrade and predicted strong westerly winds in the afternoons.

5. Procedure :

- a) Arrange for a meeting of 50-100 farmers under a shade of a tree.
- b) Ask one of the farmers to paste the 30 days weather clippings on a white sheet.
- c) Ask two separate farmers to carefully observe the 30 days trends in weather as was noticed in the news paper.
- d) Ask two more farmers to read and explain the weather predicted in the locally followed almanac.
- e) Ask two more farmers to explain on what effects of weather they observed on crops, agricultural operations and animals in the last 30 days.
- f) By carefully listening to all these farmers and after having the grip of the situation explain the scientific base of the cause and effects of weather.

6. Conclusion: The measures to be taken by the farmers may be given from the following:

The information that was collected **under item 4 c) i.e.**, Relevant information on effect of weather/ climate on crops, agricultural operations and animals.

The Comparison Concept (CC): Murthy's "Comparison Concept" (2002 and 2006) takes into account the weather/climate forecast issued in real-time basis, its derived parameters (GDD, HTU etc.) as the basis for forewarning. These real time forecasts and derived parameters are compared with the scenarios of

past seasons or years and a suitable set of common similarities on levels of pests and disease incidence and crop performance are arrived. This information helps to produce future scenarios of occurrence of pests and diseases, crop yield etc., in addition to determining the levels of incidence of pests and diseases and projected crop yield in the ongoing season. This concept would be used to develop thumb rule / dynamic simulation model / empirical model to produce future scenarios of occurrence of pests and diseases, crop yield etc., in addition to determining the levels of incidence of pests and diseases and projected crop yield in the ongoing season.

My hypothesis is that the software that would be developed my help me in realizing my BTs as detailed below:

The Blended Technologies (BTs): Murthy (2005 and 2006) observed that developing blended technologies (BTs) by bringing together the traditional knowledge pools of farmers and modern weather and climate change forecasting techniques (Sivakumar et al., 2005; Chakravarthy and Gautham 2002; and Stigter 2003) without substituting each other and respecting these two sets of values on their respective strengths would solve the agrometeorological problems of farmers . He proposed to develop very simple, farmer friendly and easy soft wares, thumb rules and Agro-Almanac in these projects. They will be made in local colloquial language, annually, low / no cost, made available sufficiently and suggest season-wise and crop-wise strategies for undertaking /avoiding farm related operations based on anticipated weather on daily/weekly/monthly/annual climate change and weather forecasting. These blended technologies would help to initiate a direct “dialogue” with the farmers. Farmers feel that they are the proud owners of the technology and their knowledge is valued.

#Also, let the farmers speak frankly at the end of the meeting (and also during the lunch/ tea) on what they learnt and your frank opinion on the meeting. The positive and negative aspects come up in the meeting become our strength.

7. Feedback and Analysis: Entrust the responsibility of pasting the weather information in the news papers on a white sheet to two farmers. Hand over the pamphlets prepared under 4 c) containing the effects of weather on the crops grown in the village and management options to two farmers . Get the feed back of the farmers at regular intervals of 10 days in a highly systematic way for TRUTHFUL analysis using different indices of agricultural extension research methodology and correcting ourselves to reach the right goals set.

Asia

India

(submitted on 7/04/'08)

I am glad you have put the situation in the right perspective and raised the issue straight forward.

I can facilitate opportunities for short term and long term training at two of our partners premises in South India. These two partners are Bharati Integrated Rural Development Society (BIRDS) in Andhra Pradesh, India (www.apfamgs.org) and Agriculture, Man, Ecology Foundation (AMEF) in Karnataka, India (www.amefound.org) with whom we are implementing large projects partnering with hundreds of thousands of farmers and active in various fields you have mentioned in your e-mail.

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Asia

India

(submitted on 18/04/'08)

Greetings from AME Foundation. We have pleasant news for the desperate students looking for training in more practical subjects.

I would like to share two such programmes we have been implementing since 2005 in the Partnership project with FAO.

1. Training of Facilitators (ToF): What started as a modified ToF, AMEF has organised 3 season-long ToFs, one each in Tamil Nadu, Karnataka and Andhra Pradesh states in southern India. The reason they were called as modified ToF was that they were different from the conventional ToF in two ways. One, the content was **focused on issues in dry farming** where the subjects covered were on on-farm rainwater conservation, means of improving soil health, modified cropping systems, biomass generation and recycling and post-harvest activities and not the “IPM” alone. The simulation studies on soil erosion, transpiration, crop combination, livestock feed and health management were found highly interesting by the participants. The second reason was that the trainees in the ToF had opportunity to organise FFS simultaneously while they were in the ToF. This was a deliberate strategy of FFS up scaling (*for details please read the article below*).

We have now developed an abridged version of the ToF, a two-week training on LEISA practices and FFS facilitation skills followed by season-long FFS sessions. This event is developed basically to reduce the cost and time intensity of the ToF and to prepare local FFS facilitators, especially among NGOs and CBOs who cannot stay away from their work for 4 long months. This is called short-term ToF (**SToF**). We have been improvising it both in content and method to suit the local livelihood needs of farmers and the specific crop-ecosystem.

What we have found from both the experiences is the enormous level of confidence these ToFs develop in the trainees. It is evident that the practical or ‘hands-on’ learning on natural farm resource management (soil, water and biodiversity) makes it different from many conventional training events. It improves the effectiveness of the delivery of capacity building activities once

the trainees undergo such training. Also, we have observed that the agricultural graduates grasp things much quicker, particularly in the STof, due to their academic background on the theory of agricultural sciences. They can visualise the possible results and insights of long-term experiments, which cannot be concluded within two weeks, without much difficulty whereas this may not be possible for non-agri candidates.

2. Fellowship Course on Sustainable Agriculture (SAFC): we have conducted three batches of training over 35 candidates. This training is meant for fresh agri graduates (the desperate ones who have learnt agriculture for 4 to 6 years but still don't know how to get into using the knowledge). This is a 8-month training programme in which they undergo an initial induction on sustainable agriculture (LEISA) in dry farming and on various participatory empowering processes such as PRA, PTD and FFS. They spend nearly 7 months working with a group of 20 farmers, all on their own, with only limited backstopping from AMEF resource persons. Here again, the emphasis is on “**operationalising**” on-farm rainwater conservation, means of improving soil health, modified cropping systems, biomass generation and recycling and post-harvest activities by employing participatory tools. We have tried to train non-agri NGO staff in the last batch with mixed results.

In terms of genesis, the SAFC programme was conceived and implemented ahead of ToFs in dry farming. The propose is to develop a ‘reservoir of young professionals’. Both types of training events have been quite useful in developing confident development professionals and on a scale any NGO can be proud of. However, they are mostly designed and implemented keeping in mind the requirements in southern India (in terms of agriculture in the dry lands of Deccan Plateau, and the language). Any student from this region contacting you could be referred to us.

While we have a dream of building a training institute to take these innovations further we, at the moment, continue to be an NGO dependent on project support!

With regards,

Arun Balamatti

Executive Director AME Foundation

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Our experiences with modified Farmer Field Schools in dryland areas

LEISA

Magazine

23.4

december

2007

Arun Balamatti and Rajendra Hegde

The Farmer Field School (FFS) approach has become wellknown after the positive experiences seen in Indonesia and other Asian countries. In many ways, however, it lends itself more to addressing the pest problems of farmers in irrigated agriculture than in dryland farming. In the latter, pests and diseases are only a part of the farming problems, often less crucial than in irrigated farming; and they need to be seen in relation to many other aspects. In this article we describe how the “conventional” IPM Farmer Field School approach has been modified in the South Indian dryland agriculture context, in order to suit the needs and problems of farmers in this area.

Transforming the FFS approach to suit dryland farming

The AME Foundation, with the assistance of FAO, has made a concerted effort to innovate and adapt the conventional FFS approach. AME is a support NGO working in the southern Indian states of Andhra Pradesh, Karnataka and Tamil Nadu. It works with groups of farmers in clusters of villages, where it promotes the use of LEISA technologies with participatory tools. Alternative farming practices are scaled up through and with NGOs and NGO networks. The capacity building of farmers and of NGO staff therefore constitute its major activities.

AME has been using the FFS approach since the late nineties. In 2005, with the initiation of a partnership project with FAO, the process of adapting and transforming FFS process and contents was given a further boost. The key challenge was to transform the contents’ orientation, which was mainly on the plant–ecosystem relationship, to the interrelated aspects of rainwater, soil fertility, crops and cropping system management and biomass, in a wider

livelihoods context. Another challenge was to organise the entire capacity building process in such a way that it would be possible to achieve maximum up- and out-scaling of the FFS contents, without diluting the quality of the learning experience. AME thus embarked on a “Modified Training of Facilitators” programme (MToF) in Dharmapuri, a district in Tamil Nadu, in partnership with MYRADA, a large local NGO. This programme aims to train facilitators who can independently conduct FFSs in a dryland context. About 2500 Self help Affinity Groups (SAGs) have been organised in this area, and these in turn have formed eighteen Community Managed Resource Centres (CMRCs), with the basic objective of being a “service provider” for the development needs of the member SAGs. In total, nearly 40 000 families are involved. This offered an excellent platform for the large scale promotion of LEISA approaches in dryland farming.

Content innovation

Groundnut is the major crop grown in Dharmapuri under rainfed conditions. While the average yields are poor, pests and diseases are only one of the problems which farmers face. The inadequate rainfall and its poor distribution, poor soil fertility and inappropriate agronomic practices are also key problems. AME therefore decided to bring these issues into the FFS curriculum. The discovery learning and experiential learning opportunities stretched beyond the crop-ecosystem interaction; in fact, an attempt was made to address livelihood improvement in the drylands, which encompasses crop husbandry and related activities. Short studies and long-term experiments were designed around *in situ* rainwater conservation, improving soil fertility and modified cropping systems. Support activities like biomass generation, kitchen gardening, the cultivation of azolla, livestock management and vermicomposting were included to ensure that the programme was “livelihood” focused in addition to being “crop” focused. Insect zoos and studies normally form part of the IPM Training of Facilitators curriculum, along with an agro-ecosystem analysis (AESA). In our “Modified Training of Facilitators” we included several new studies and experiments:

1. Soil moisture management: Various simple experiments were designed for assessing and measuring the soil’s physical properties, the erosion, the water infiltration rate and water holding capacities, and the effects of preparatory tillage;
2. Soil fertility improvement: Experiments were also designed to determine the effect of enriched farmyard manures, *in situ* green manuring, composting and vermicomposting;

3. Modified cropping practices: We also considered testing the viability of the groundnut seed (after removing the seed coat), its germination, the different methods of sowing, the optimum sowing depth, and practices such as strip cropping;
4. IPM: Pot experiments were included, looking at the role of *Rhizobium*, the uptake of nutrients, the effect of inorganic fertilizers on soil micro-organisms, the effect of *Trichoderma viridae*, different options for intercrops and trap crops, the efficiency of bio pesticides and the calculation of the leaf damage area, among others; and
5. Support activities: Finally, we also included a series of support activities, such as establishing kitchen gardens, making silage and mushroom production.

Process innovation

An extension approach can only have an enduring impact if it can be scaled up. Initial FFS experiences have been mainly built around governmental extension systems; the underlying assumptions being that extension is a governmental responsibility, and that the government extension system has a larger coverage. However, as governments became interested in the FFS approach, its philosophy has often been diluted, and after a few years not too much remains of its original learning-oriented spirit.

The AME Foundation decided to follow a different approach. It chose to work with NGOs which reach large numbers of community-based institutions. Rather than training the government or NGO extension workers, we decided to look to the communities as the starting point for up-scaling. Young farmers linked to the CMRCs were included in the training courses; the aim was to make the FFSs an integral part of the service provision package of these centres. The conventional Training of Facilitators, involving five-day classroom sessions and one-day practices, was changed to three days of classroom sessions followed by three days of practical work. The “practice FFS farmers”, in turn, adopted 3 to 5 farmers to share their learning. In this way, it has been a three-level learning opportunity for the participants: one, as participants, they learn the skills of facilitation; two, by conducting “practice FFS”, they get “hands-on” experience of facilitating FFS with the farmers. And finally, by helping the “practice FFS farmers” adopt more farmers, the participants could obtain feedback from the fellow farmers to ensure the curriculum is always need-based. This way, it has been an educational investment to prepare FFS trainers and, simultaneously, an extension activity to involve more farmers in FFS. During the last few years, 32 Community Resource Persons have been trained in the FFS methodology; nearly 900 farmers have been directly involved in the “practice FFS”, with more than 1300 farmers being involved indirectly. These activities have created space for the participation of a large number of women,

in some cases making up to 90 percent of all participants.

The adoption of certain practices implied that the new studies within the Modified ToF curriculum were found useful. Vermicomposting, kitchen gardening and the production of azolla became instantly popular among the “practice FFS farmers”. A recent study conducted by FAO and AME on the impact of the “Modified Training of Facilitators” on participants’ livelihoods revealed that the FFS training has improved participants’ skills and abilities. The FFS training has strengthened women’s knowledge and skills on soil and water conservation, soil fertility management and better practices of crop production and protection. The availability of food crops for home consumption has improved. FFS farmers have earned a remarkably higher income from agriculture as a result of improved management of their fields. FFS training has also enabled women to be better decision makers, particularly in the area of livestock management.

The way forward

Our experience has shown that it is possible to adapt the FFS approach to a dryland context, effectively tackling pests and diseases, though as part of larger set of problems. In the IPM Farmer Field Schools the emphasis is on growing a healthy crop, whereas in a dryland FFS, the facilitators have to skilfully use this principle in its broader farming system perspective. The FFS approach can be an empowering tool in a dryland farming context, provided the facilitators have the sensitivity and skills to design learning exercises for farmers that focus on location-specific technologies relevant to their specific context.

Similarly, the process suggests that it is possible to upscale the FFS approach, provided there is a sound base in the form of community-based institutions. This year, the AME Foundation is running nearly 600 FFS events in 13 different cropping systems, covering over 10 000 farmers in 500 villages, 11 districts and 3 states. This level of up-scaling could not have been achieved without the local organisations. Among the lessons we have learnt in the process:

- A thorough understanding of livelihood systems is necessary for developing a broad-based FFS curriculum. The continuous interaction of the facilitators with farmers, research and extension agencies enriches the curriculum;
- Larger farmer outreach is easier if there are organised groups close to the training location. The existence of such organisations is likely to be a condition for the sustained impact of FFS;
- Training events, proper planning and preparations for the “practice FFS” and receiving feedback after the sessions are crucial steps. They need to be properly

managed, or else these could eat into the precious little time available for classroom sessions;

- While the ToF events requires intensive involvement of both facilitators and participants, the overall cost of the ToF and the follow up FFS events becomes justified, keeping in mind the substantial farmer outreach.

AME plans to evaluate this process again at the end of the 2007 season. It is expected that the effectiveness of the programme will depend to a large extent on whether and how the CMRCs will continue to use the services of the trained FFS facilitators. Regular monitoring and refresher courses for updating the facilitators' knowledge and skills are essential to maintain the impact of FFS in future. If these Resource Centres are able to provide sustained follow-up to the FFS, with minimum external support, it will mean that FFS can become an effective, affordable and sustainable extension strategy in dryland agriculture.

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Acknowledgements

It was Dr. S. Balasubramanian (Dy. Director, Plant Quarantine Systems) who suggested the MToF idea. Mr. G. Ravikumar, with the help of his colleagues in Dharmapuri and of the facilitators from the Karnataka and Tamil Nadu State Departments of Agriculture, conducted the events successfully. We thank them for their efforts and innovations.

South-West Pacific

Australia

(submitted on 3/04/'08)

This is in reference to your e-mail regarding training facilities. I am serving as Assistant Professor at the National University of Sciences and Technology (NUST), Pakistan and presently pursuing my PhD studies in Applied Hydrology at the International Centre of Water for Food Security (IC WATER), Charles Sturt University, Wagga Wagga, NSW 2678, Australia. In regard to training facilities, IC WATER can provide training in water resources management at both catchment and farm level. The IC Water is the Australasian host of the UNESCO's Hydrology for the Environment, Life and Policy (HELP) initiative under the International Hydrology Program (IHP) . The accreditation of the Centre as the UNESCO IHP International Centre of Water for Food Security is in its final stages of approval. The IC Water aims to emphasize the pursuit of sustainable development and integrated water resources management in rural and peri-urban food production systems through scientific research, education, training and awareness-raising at all levels. It also endeavors to assist development of appropriate policies and practices for environmentally sustainable and economically viable food production through international networking among scientists and the transfer of information and knowledge to stakeholders and general public. The aims of the IC Water are:

- ❑ To utilize expertise of its staff and students to produce new knowledge and innovative ideas in water resources management
- ❑ To improve the efficiency of agricultural system without creating any negative impacts on environment
- ❑ To adopt holistic approach to ensure resource and energy conservation
- ❑ To involve all stakeholders to ensure equity and research application
- ❑ To transfer knowledge and experience through international linkages, training, publication of research outcomes and international conferences

Further details can be assessed at the IC WATER website <http://www.icwater.org>

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Europe etc.

Israel

(Submitted 3/04/'08)

We in MIGAL provided such training and assisted in creation of agrometeorological networks oriented mainly toward irrigation management information systems, but supporting other farming applications, as pest and disease control, frost protection, and various degree-day models for crop management in Central Asia and the Middle East. We accomplished those missions by outside funding, as we don't have funding of our own.

Please send the format of the information for your catalog, and we will sign in.

Moshe Meron

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Note by Kees Stigter. Only on 23/6 I sent the following note to Dr. Meron:

I have now started to bring the information received from more than 20 programmes into one document. The information is so different and comes in such different ways that a real subject format is out of the question.

The format becomes a simple geographic one, meaning I will have information on submission from six regions: Africa, Asia, South America, North and Middle America, South-West Pacific and Europe. Within each region, countries are distinguished. When there is more than one reply from a country, I use the chronological sequence in which the information was received.

Many replies have a short introduction to the training provided and then either a website to which people can be directed and/or one or two e-mail addresses for further information and/or there were one or two files that I will take up when not too long or that people can demand to be sent if they are long.

Could you send your information that way soonest?

Due to holidays of the INSAM technical staff, I had to submit this first version on 26/6. In the second version we will show the details that will be sent. You can contact Dr. Meron on those details already in the meantime.

Europe etc.

FAO

(Submitted 3/04/'08)

Here are a few free e-learning courses from FAO that may be of interest.

1. Climate and flood forecast applications in agriculture - An interactive, web-based e-learning tool

Consists of six modules: a description of context; basic aspects of weather and climate; bio-physical interactions and impacts; and application of climate and flood information for disaster preparedness. Background reading material, maps and figures are included under the last module.

2. The EC-FAO Food Security Programme has published 6 e-learning courses related to food security. The courses consists of 2 to 4 self-paced e-learning lessons of approximately 30 to 45 minutes duration each. Each course also come with a set of PowerPoint slides, handouts and exercises, which can be easily customized by trainers to help develop their own face to face training based on each lesson. The courses are available on CD and the WWW. To access the courses free of charge visit the EC-FAO Food Security Information for Action Programme website at: www.foodsecinfoaction.org.

Look under the Distance Learning section for more information. You will have to register to take the courses online or to order free CDs. There is no charge and it only takes a few minutes to register.

Available courses:

Food Security Information Systems and Networks - This course introduces and provides guidance in assessing different kinds of information systems related to food security analysis (2 hours).

Reporting Food Security Information - This course provides guidance in designing, writing and increasing the impact of food security reports in different contexts (3.5 hours).

Availability Assessment and Analysis - This course introduces the most commonly used methods to assess food availability at regional, national and local levels. It also provides examples and criteria for selecting the appropriate availability indicators (1.5 hours).

Baseline Food Security Assessments - This course describes the purpose and features of baseline assessments and how they differ from action-oriented assessments. The course also provides guidance on selecting a baseline assessment method depending on the context, and on how to incorporate historical trends when conducting food security assessments (2 hours).

Collaboration and Advocacy Techniques - This course illustrates a wide range of tools and techniques that can be used to improve collaboration and knowledge sharing, and provides guidance on conducting collaborative food security assessments. The course also introduces the concept of advocacy and the various advocacy techniques required to influence different audiences (3 hours).

Livelihoods Assessment and Analysis - This course introduces the concept of livelihoods and the components of the livelihoods framework. It also provides guidance on assessing livelihoods in different food security contexts and on selecting and interpreting livelihoods indicators (2 hours).

Nutritional Status Assessment and Analysis - This course covers the basic concepts of malnutrition, describes how nutritional status is assessed, and identifies the most commonly used nutrition indicators, as well as the criteria to be used when selecting the indicators in specific contexts and situations (2 hours).

For more information, see the websites:

<http://www.webgeo.de/module/applied/FAO/probabilisticforecasts-bgd-fao.html>

and

http://www.foodsec.org/DL/dlcourselist_en.asp

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Europe etc.

Netherlands

(Submitted 3/04/'08)

Submitted by Prof. Kees Stigter (cjstigter@usa.net)

**CAPACITY BUILDING IN THE AREA OF
AGROMETEOROLOGICAL SERVICES
THROUGH ROVING SEMINARS**

{version of March 2008}

At the 13th session of CAgM in Ljubljana and the 14th session in New Delhi, roving seminars on agrometeorological services have been suggested. The present document illustrates two ways in which courses for such roving seminars were prepared. Both ways were tried out and the contents were very positively assessed by those attending these courses. They are also offered as a basis for use by WMO/FAO in their roving seminar traditions.

The history of the development of these Roving Seminars is available at the INSAM website under "History of Agrometeorology", under "A contemporary history of a new approach to applied agrometeorology" (6/02/'06).

The Roving Seminars, each of one week duration, are detailed in the two Appendices below.

Appendix I (of Capacity Building paper)

AGROMETEOROLOGICAL SERVICES: THEORY AND PRACTICE

This is a series of lectures together with roundtable discussions (question sessions) and master class ideas. The lectures and their sources are identified below. Each lecture has at the end one slide with Conclusions and one with Recommendations.

The roundtable discussions should take place after each lecture. If the class is small, questions may be taken during the lectures as well. Master classes work well with small numbers at Universities. The master classes should be organized in a way that (preferably all) members of the audience make a presentation about their research, why it was chosen, what the difficulties are and where the results are applied, may be applied or should be applied but are not. This is an essential part of the course.

In South Africa, for an audience of mid-career agricultural officers from the government and some participants from NGOs, we replaced it with group discussions in small groups that reported back to the meeting and dialogues between the speaker and the audience.

The course was preceded by an introduction in PowerPoint on why Stigter had chosen this approach, to be understood from his own historical background and experiences in Europe, Africa and Asia.

COMPOSITION OF THE COURSE CONTENTS

1. Zoning & mapping as agrometeorological services in developing countries.

This lecture is based on

Stigter, C.J. & Al-Amin, Nawal K.N., 2006. Zoning and mapping as agrometeorological services in developing countries: preconditions and requirements in a checklist for action. Paper presented at the COST/FAO/WMO/IBIMET Workshop on Climatic Analysis and Mapping for Agriculture, Bologna, June 2005, in print.

2. Farming systems, agrometeorology and agrometeorological services.

This lecture is based on a wide and abundantly exemplified definition of agricultural meteorology developed for Eijkelpark Agrisearch BV, and on parts of a paper presented in Beijing in 2003:

Stigter, C.J., 2003. The future of education, training and extension in agricultural meteorology: a new approach. In: Zheng Dawei et al. (Eds.), The Future of Agrometeorological Education in China, Proceedings of a Workshop, China Agricultural University, Beijing (all papers but this one in Chinese).

3. The place of agrometeorological services in the livelihood of farmers.

This lecture is based on parts of the above Beijing paper (under 2.) and introductory parts of the Banjul paper:

Stigter, C.J., 2004. The establishment of needs for climate forecasts and other agromet information for agriculture by local, national and regional decision-makers and users communities. Pp 73–86 in: Applications of Climate Forecasts for Agriculture. Proceedings of the RA I (Africa) Expert Group Meeting in Banjul, the Gambia (December 2002). AGM-7/WCAC-1, WMO/TD-No. 1223, WMO, Geneva.

***Note:* For this lecture 3. I made also use of a column written for the INSAM website on three main conclusions from recommendations of a meeting of Health Ministers and a parallel one of NGOs in Mexico on funding health services research and what applies of these conclusions to funding of agrometeorological services research:**

Stigter, C.J., 2004. Beyond better funding for agrometeorological research. INSAM website (www.agrometeorology.org) under the topic of the “Agromet Market Place”.

4. Agrometeorological services for user communities, some lessons learned

This lecture is based on the remainder of the above mentioned Banjul paper and experience obtained in involvement of a few years (1999 – 2005) in research at the Wuchuan Experiment Station, Inner Mongolia, China.

Parts of these results can be found in the following two papers:

Zheng Dawei, Zhao Ju, Tuo Debao & Stigter, C.J. 2005. Reversing land degradation from wind erosion in Inner Mongolia: the choice between grass and bush restoration or conservation tillage of contour strip plantings depends on hill slopes and rainfall. *Journal of Agricultural Meteorology (Japan)*, 60, 337–341.

Zhao Caixia, Zheng Dawei, Stigter, C.J., He Wenqing, Tuo Debao & Zhao Peiyi, 2006. An index guiding temporal planting policies for wind erosion reduction. *Arid Land Research and Management*, 20 (3), in print.

5. Using traditional methods and indigenous technologies for coping with climate variability.

This lecture is based on the Ljubljana paper:

Stigter, C.J., Zheng Dawei, Onyewotu, L.O.Z. & Mei Xurong, 2005a. Using traditional methods and indigenous technologies for coping with climate variability. *Climatic Change*, 70, 255-271.

6. Research and reality.

The first half of this lecture is based on parts of a course developed in Bogor, Indonesia, from the results of the African TTMI-Project, also resulting in a discussion on where to take care of in the writing of project proposals. The second half illustrates the derived principles with the reality of a project in Nigeria of which the most relevant parts of the results have been published in:

Onyewotu, L.O.Z., Stigter, C.J., Abdullahi, A.M., Ariyo, J.A., Oladipo, E.O. & Owonubi, J.J., 2003. Reclamation of desertified farmlands and consequences for its farmers in semiarid northern Nigeria: a case study of Yambawa rehabilitation scheme. *Arid Land Research and Management*, 17, 85–101.

Onyewotu, L.O.Z., Stigter, C.J., Oladipo E.O. & Owonubi, J.J., 2004. Air movement and its consequences around a multiple shelterbelt system under advective conditions in semi-arid northern Nigeria. *Theoretical and Applied Climatology*, 79, 255–262.

and

Onyewotu, Lambert, Stigter, Kees, Abdullahi, Yusuf & Ariyo, Joo, 2003. Shelterbelts and farmers' needs. *LEISA Magazine on Low External Input and Sustainable Agriculture* 19 (4), 28-29.

7. Policies and preparedness.

This lecture is based on:

Stigter, C.J., Das. H.P. & Murthy, V.R.K., 2003. Beyond climate forecasting of flood disasters. Invited Lecture on the Opening Day of the Fifth Regional Training Course on Flood Risk Management (FRM-5) of the Asian Disaster Preparedness Center (Bangkok) and the China Research Center on Flood and Drought Disaster Reduction (Beijing), Beijing, September. Available from ADPC (Bangkok) on CD-ROM.

8. Agrometeorological services making a difference for poor farmers. I. Why it does not happen. II. How it can be done.

These closing lectures are based on several unpublished invited contributions written for conferences that were postponed (*Abuja*), for which no money could be found for my attendance (*Buenos Aires, Havana*) or that after all clashed with other commitments (*Jakarta*).

One contribution was written by

Stigter, Kees, Oluwasemire, Tunji, Onyewotu, Lambert, Oteng'i, Silvery, Kinama, Josiah, Zheng Dawei, Zhao Caixia, Zhang Yingcui, Murthy, V.R.K., Rashidi, A.G.M., Abdalla, Ahmed T. , Al-Amin, Nawal K.N. & Bakheit, Nageeb I.

The following published invited review paper contains rather some of that material from Africa in another context:

Stigter, C.J., Oteng'i, S.B.B., Oluwasemire, K.O., Al-Amin, N.K.N., Kinama, J.M. & Onyewotu, L.O.Z., 2005. Recent answers to farmland degradation illustrated by case studies from African farming systems. *Annals of the Arid Zone*, in print.

Appendix II (of Capacity Building Paper, updated and adapted in March 2008)

AGROMETEOROLOGY AND SUSTAINABLE DEVELOPMENT

This Workshop (as a Course) is on “Agrometeorology and Sustainable Development: agrometeorological services to prepare farmers for climate extremes and climate use”.

It is a series of lectures with questions, dialogues and (group) discussions of which parts can be filled in by the organizers. Each lecture has at the end one slide with Conclusions and one with Recommendations.

In Iran they could not find sufficient lecturers of sufficient level to give such additional lectures on local conditions. Therefore the Workshop became one of 3 days in which we used 22 hours in total to go in a very participative way through the material of the other lectures. The audience existed of between 70 and 80 people of very different backgrounds that indeed were present and participating all of the time. I have never seen an audience like this! Their argument: “there was never a Workshop like this in our faraway province! We want to make the maximum use of it”.

This Second Roving Seminar was given in Iran at a different place for a different audience than the First Roving Seminar, and the same applies for the parts given in Hyderabad and Pune, in India, and in Aracuja (Brazil) and Maracay (Venezuela). For South Africa, with a good part of the same audience for the two Roving Seminars, this Second Roving Seminar has been updated and adapted to that situation.

Because of their importance, we start the syllabus bundle of papers with some of the conclusions of the First Roving Seminar, that are also a good start for this Second Roving Seminar, summarized in:

Stigter, Kees, 2006. *Scientific Research in Africa in the 21st century, in need of a change of approach. African Journal of Agricultural Research, 1(1): 5-9.*

Stigter, Kees (C.J.), Kinama, Josiah, Zhang Yingcui, Oluwasemire, Tunji (K.O.), Zheng Dawei, Al-Amin, Nawal K.N. & Abdalla, Ahmed el-Tayeb, 2005. *Agrometeorological services and information for decision-making: some examples from Africa and China. Journal of Agricultural Meteorology (Japan), 60: 327–330.*

COMPOSITION OF THE COURSE CONTENTS

- *Introduction to the approach (updated)*

Specially written introduction to why the approach taken in this course was chosen. The Conclusions and Recommendations of this part were:

Conclusions from the intro:

- *Analyses of existing priority problems must be made for the current farming systems, with the farmers concerned themselves advising on their needs.*
- *Provincial/regional agrometeorologists are as important as the means they have to actually serve the farmers with planning and information.*
- *All local research undertakings must intentionally be related to these means, needs and problems.*

Recommendations from the intro:

- *Dialogues with farmers, of each farming system distinguished in the region, are the very beginning of preparing for agrometeorological services.*
- *For various groups involved, income levels must be considered as well as occupation, where applicable.*
- *An inventory of best practices for natural risk reduction, that have actually made a difference in the livelihood of farmers, should be established.*

A paper has in the meantime been published in Brazil that was partly based on this introduction.

Kees Stigter, 2007. *Agrometeorological services to prepare farmers for climate extremes and climate use*. Paper presented under “Agrometeorology and Sustainable Development” at the XVth Congress of the Brazilian Society for Agrometeorology, Aracaju, Brazil, July. Invited paper. *Revista Brasileira de Agrometeorologia*, 15: 202-207.

- 1. *What is sustainable development? (updated as paper 1.)*

Specially written introduction to the core subject for this course.

1.1 *What is sustainable development?*

1.2 *Role of agricultural meteorology?*

1.3 *What about the role of research?*

1.4 *Can development be sustainable when the climate is not sustainable?*

Conclusions from Part 1:

- *Means of communication & education are part of sustainable development.*
- *To a large extent only richer farmers are able to make use of whatever support systems are organized while the majority of marginal farmers are left in misery.*
- *Developing a response farming approach, with forecasting capabilities that change and improve in the course of time, is a condition for sustainable development.*

Recommendations from Part 1:

- *Use the expression “agrometeorological services to prepare farmers for climate extremes and climate use” because it is closest to reality.*
- *New or adapted preparedness strategies have to be developed as responses to increasing climate variability, but once response farming is aimed at, this remains the same approach but to more varying conditions.*
- *Society as a whole must want to focus on rural as well as industrial development. The latter, however, has to be of a completely new and different approach.*

The above questions 1.1 – 1.4 are also dealt with in the same paper as mentioned already above:

Kees Stigter, 2007. *Agrometeorological services to prepare farmers for climate extremes and climate use. Revista Brasileira de Agrometeorologia, 15: 202-207.*

Other parts can be found in:

Kees Stigter, 2008. *Coping with climate risk in agriculture needs farmer oriented research and extension policies.* Paper presented under “Socialization of the contents of agrometeorology in Latin America” as the closure lecture on 30 November 2007 at the “First Venezuelan Congress of Agrometeorology” and the “Fifth Latin American Meeting on Agrometeorology”, concurrently held in Maracay, Venezuela. *Revista Scientia Agricola (Brazil), 2008, in print.*

- *3. The role of agricultural research in establishing agromet services (updated as paper 2.)*

This is an elaborate and now also updated extension written for this course based on:

Stigter, Kees (C.J.), 2005. *Building stones of agrometeorological services: adaptation strategies based on farmer innovations, functionally selected contemporary science and understanding of prevailing policy environments.* Paper presented as the opening keynote lecture at the International Symposium on Food Production and Environmental Conservation in the Face of Global Environmental Deterioration (FPEC, 2004), Fukuoka, Japan. *Journal of Agricultural Meteorology (Japan), 60: 525–528.*

Stigter, C.J., 2007 (Guest Editorial). *From basic agrometeorological science to agrometeorological services and information for agricultural decision makers: a simple conceptual and diagnostic framework. Agricultural and Forest Meteorology, 142: 91-95.*

Stigter, C.J., 2008 (Review paper). *Agrometeorology from science to extension: assessment of needs and provision of services. Agriculture, Ecosystems and Environment, in print.*

and

Murthy, V.R.K. & Stigter, C.J., 2005. *Operational agrometeorological services for extension needs and the supportive role of agricultural research.* Pp. 199-208 in: *Strengthening*

Operational Agrometeorological Services at the National Level, Proceedings of a Regional Meeting, Manila, Philippines. AGM-9, WMO/TD-No. 1277, WMO. Geneva. Also available on-line at the WMO/CaGM website.

Note: For each of the classes of agrometeorological services distinguished, examples are discussed to show the difference between E1 guided research on action support systems to mitigate impacts of disasters (our good intentions of applied agrometeorology) and E2 guided research on agrometeorological services supporting actions of producers and other decision makers (that are necessary in the new approach).

- **4. Examples of agrometeorological services in the literature (updated as paper 3.)**

For this lecture we have collected and extensively discussed the following examples of agrometeorological services from the literature:

- **examples from the recent 2004/2005 INSAM contest (Portugal, Cuba);**
- **other examples from Europe and close to Europe (Netherlands, Israel);**
- **examples from Guangdong Province and Ningxia Autonomous Region (China);**
- **other examples from Asia (India);**
- **examples from Africa (Mali, Ethiopia, Sudan (among which winners from the second (2006) INSAM contest).**

An extended abstract of three pages based on parts of this lecture can be found on the INSAM website under the topic of “Accounts of operational; agrometeorology” after a memorial lecture Stigter gave in the Royal Academy of Dublin on 2 March 2006, using most of this material. Literature is provided on all the above examples.

The last two examples, from Sudan, are from TTMI-Research. They are based on:

Stigter, C.J., Mohammed, Ahmed Eltayeb, Al-Amin, Nawal K. Nasr, Onyewotu, L.O.Z., Oteng'i, S.B.B. & Kainkwa, R.M.R., 2002. *Agroforestry solutions to some African wind problems. Journal of Wind Engineering and Industrial Aerodynamics, 90: 1101–1114.*

Stigter, C.J., Al-Amin, Nawal K. Nasr, Oteng'i, S.B.B., Kainkwa, R.M.R. & Onyewotu, L.O.Z., 2003. *Scattered trees and wind protection under African conditions.* In: B. Ruck, C. Kottmeier, C. Mattheck, C. Quine & G. Wilhelm (Eds.), *Wind Effects on Trees.* University of Karlsruhe, Germany, pp. 73–80.

Abdalla, A.T., Stigter, C.J., Bakheit, N.I., Gough, M.C., Mohamed, H.A., Mohammed A.E. & Ahmed, M.A., 2002. *Traditional underground grain storage in clay soils in Sudan improved by recent innovations. Tropicultura, 20: 170–175.*

Bakheit, Naguib Ibrahim, Stigter, Kees & Abdalla, Ahmed el-Tayeb, 2001. *Underground storage of sorghum as a banking alternative. Low External Input and Sustainable Agriculture (ILEIA Newsletter), 17 (1): p. 13.*

and

Bakheit, Naguib Ibrahim & Stigter, Kees, 2004. *Improved matmuras: effective but underutilized. LEISA Magazine on Low External Input and Sustainable Agriculture, 20 (3): p. 14.*

- **5. *Preparation of farmers for climate extremes and climate use (replaced with paper 4.)***

This lecture is based on the following papers:

Stigter, Kees, 2006. *Apropos the floods and landslides on Java: coping with disasters. INSAM website under “Agromet market place” of 24-01-06.*

Stigter, Kees, 2006. *Even the present situation in Aceh/Sumatra, Indonesia, bears similarity with problems encountered with introduction of agrometeorological services: another story of parallels. INSAM website under “Agromet market place” of 09-01-06.*

Stigter, Kees, 2008. *Panta rhei: changes in agrometeorological adaptation strategies to climate change. Abstract of presentation at the Combined Congress, Grahamstown, South Africa, January.*

Stigter, Kees, Das, Haripada & Van Viet, Nguyen, 2007. *On-farm testing of designs of new cropping systems will serve Indonesian farmers. INSAM website under “Needs for agrometeorological solutions to farming problems” of 16-01-07.*

Rathore, L.S. & Stigter, C.J., 2007. *Challenges to coping strategies with agrometeorological risks and uncertainties - Regional Perspectives: Asia. In: M.V.K. Sivakumar and R. Motha (Eds.), *Managing weather and climate risks in agriculture.* Springer, Berlin/Heidelberg (pp. 53-69).*

- **6. *Actual needs of farming systems and their farmers: some case studies (replaced with paper 5.)***

This lecture is based on the following papers:

Stigter, Kees, 2008. *Operational agrometeorology: problems and perspectives. Invited paper for a “souvenir” booklet issued at an international agrometeorology meeting in Hyderabad, India, held in February 2008. CRIDA, Hyderabad, in print.*

Stigter, C.J., Tan Ying, Das, H.P., Zheng Dawei, Rivero Vega, R.E., Nguyen van Viet, Bakheit, N.I. & Abdullahi, Y.M, 2007. *Complying with farmers' conditions and needs*

using new weather and climate information approaches and technologies. In: M.V.K. Sivakumar and R. Motha (Eds.), Managing weather and climate risks in agriculture. Springer, Berlin/Heidelberg (pp. 171-190).

Rathore, L.S. & Stigter, C.J., 2007. *Challenges to coping strategies with agrometeorological risks and uncertainties - Regional Perspectives: Asia.* In: M.V.K. Sivakumar and R. Motha (Eds.), *Managing weather and climate risks in agriculture.* Springer, Berlin/Heidelberg (pp. 53-69).

- **15. *The role of civil servants and NGOs in preparing farmers (updated and extended as paper 6.)***

For this paper I used:

Stigter, Kees, with Rathore, L.S., 2008. *How to organize coping with crop disease risks of farmers in poor countries.* Paper presented at the Asian Pacific Network Review and Planning Workshop in Dhaka for the APN Project “*Climate and Crop Disease Risk Management: an International Initiative in the Asia-Pacific Region*” (February 11-14, 2008)

This is the first of three closing papers originally specially written (in Beijing in October 2005) for presentation after the local lectures in the Workshop. This has now been updated and extended in Bloemfontein in March 2008. Here the Conclusions and Recommendations are reproduced.

Conclusions from Part 6:

- ***NGOs are very popular in western countries (unions, non-profit organizations) but also for example in Bangladesh, India and Sri Lanka (grassroot movements).***
- ***For actual agrometeorological services you also need applied scientists to develop them, and extension intermediaries with sufficient basic knowledge for trying them out with farmers in the field.***
- ***Development of community based (preparedness and mitigation) strategies are particularly encouraged for governments in disaster risk reduction. This is confirmed by the lessons illustrated.***

Recommendations from Part 6:

- ***Government and NGOs should work complementary. Governments must be able to leave certain interests to those concerned, organized in/by NGOs.***
- ***In each NMHS a Services Department should have a section “Agromet Services” that is specialized to “promote” agrometeorological services, also to poorer farmers. The lessons learned should be followed fully or partially by these weather services and by the research institutes and universities.***
- ***Civil servants at NMHSs can make weather “advisory” products of their organization more “client friendly”. Again the same applies to research institutes and universities.***

- 16. *Training of agromet intermediaries to prepare farmers as end users (updated as paper 7.)*

For this paper I used:

Stigter, C.J., 2007. *Agricultural meteorology over the years, new priorities and consequences for curricula*. In: M.V.K. Sivakumar & J. Hatfield (Eds.), *Guidelines for curricula in agrometeorology*. WMO, Department of Education, Geneva, in press.

Stigter, C.J., with the EMCIAM team, 2007. *A syllabus for intermediaries*. In: M.V.K. Sivakumar & J. Hatfield (Eds.), *Guidelines for curricula in agrometeorology*. WMO, Department of Education, Geneva, in press.

Stigter, C.J., with the EMCIAM team, 2007. *Subjects in Applied Agrometeorology*. In: M.V.K. Sivakumar & J. Hatfield (Eds.), *Guidelines for curricula in agrometeorology*. WMO, Department of Education, Geneva, in press.

This is the second of three closing papers originally specially written (in Beijing in October 2005) for presentation after the local lectures in the Workshop. This has now been extended and updated in Bloemfontein in March 2008. Here again Conclusions and Recommendations are reproduced.

Conclusions from Part 7:

- *The proven urgent need for better on-farm preparedness for environmental calamities is equivalent to a revival of response farming.*
- *In non-industrialized countries, training of intermediaries would go a long way in solving problems for various groups of all but the richest and best educated farmers. Training programs at all levels must therefore be adapted to national and regional needs. The curricula given make this attempt.*
- *The education and in service training of agrometeorological extension intermediaries is an essential part of the new approach, that appears necessary in education, training and extension in agricultural meteorology.*

Recommendations from Part 7:

- *It would help if we created a database of sound and dependable supportive (“derived operational”) research applications “that work with the neighbours”.*
 - *CAGM and INSAM should support attempts to strengthen policies as a building block in the B-domain. This should aim at filling gaps between the providers of agrometeorological products and actual agrometeorological services in the livelihood of farmers.*
 - *Improved agricultural management operations, on a large scale, would indeed be one of the most practical contributions to sustainable development.*
- 17. *Conflicts of interests in a bottom-up approach in agrometeorology (updated as paper 8.)*

This is the last of three closing papers originally specially written (in Beijing in October 2005) for presentation after the local lectures in the Workshop. This has now been updated and extended in Bloemfontein in March 2008. Here again Conclusions and Recommendations are reproduced.

Conclusions from Part 8:

- *The details of the examples from Sudan illustrate that the use of science (agrometeorology) is not neutral but a matter of policies that can lead to conflicts.*
- *What is a disaster in one place may be a blessing elsewhere (Eucalyptus, Acacia tortilis, Prosopis juliflora).*
- *In developing countries agrometeorology means immediate development of design rules and validation & extension with participation of people concerned.*

Recommendations from Part 8:

- *Rehabilitation of the sand invaded areas in Sudan with desert vegetation efficiently reducing wind speed close to the ground, this way settling sand, appears the best solution in a second front against desert encroachment.*
- *Bottom up we have to pay attention to local innovations and understand the agrometeorological components scientifically, often by quantification, to make the most effective designs.*

These Conclusions and Recommendations of part 8 are illustrated with results from the following papers:

Al-Amin, Nawal K. Nasr, Stigter, Kees (C.J.), Elagab, Mutasim A.M. & Hussein, Mohammed Bedawi, 2005. *Combating desert encroachment by guiding people, wind and sand. Journal of Agricultural Meteorology (Japan), 60: 349–352.*

Al-Amin, Nawal K. Nasr, Stigter, C.J. & Mohammed, Achmed El-Tayeb, 2006. *Establishment of Trees for Sand Settlement in a Completely Desertified Environment. Arid Land Research and Management, 20 (4): 309-327.*

- 18. *Conclusions and recommendations*

All Conclusions and Recommendations of my now 9 lectures (from Introduction to Paper 8 inclusive), for which I made available 26 papers of mine as well as separate background information for Part 3 (Lecture 3), should be made available as the first information in the Course Book in which this literature is reproduced.

At the end a comparison can be made between what was concluded and recommended from the core lectures and from the local lectures:

- 2. Status quo and recent changes in local agriculture

- **7. The reality of local farming: classes of farmers and their needs**
- **8. Existing local weather and climate products**
- **9. Local use of weather and climate products**
- **10. Local climate information effectiveness**
- **11. Locally existing extension and extension agro-meteorology**
- **12. What new weather and climate products would local farmers like?**
- **13. What new products could be developed for local farmers?**
- **14. Collaboration with other locally operational science and extension.**

A MUCH LONGER VERSION OF THIS DOCUMENT IS AVAILABLE ON CD ROM IN WHICH ALL QUOTED PAPERS ARE ACCOMPANIED BY THEIR ABSTRACTS

Europe etc.

ILEIA

(Submitted 21/04/'08)

I would like to respond to your request for information about practical agricultural training materials appropriate to the developing world. We at ILEIA (Information Centre on Low External Input and Sustainable Agriculture) are presently designing a series of pedagogical materials with as target group educators and field workers who train extensionists or work with smallholder farmers in developing countries. The series of modules, called Farming Matters, will provide practical information on improving agriculture based on a LEISA (low external input and sustainable agriculture) approach. This includes not only physical agricultural practices, but will integrate social and economic aspects of agriculture throughout the series. The series will provide suggestions on pedagogical tools such as those used by the Farmer Field Schools, and will pose questions that help trainers to ground the topics into their own context.

We will develop this series in collaboration with ILEIA's regional partners in Peru, Brazil, Senegal, India, Indonesia and China who are directly engaged in fieldwork with farmers, extension workers, NGOs, as well as field minded researchers. We propose to develop the series through a wiki format, that allows resource people and practitioners from around the world to participate in its development. We hope that in this way, it will be enriched by a wide range of experiences before publishing it in a 'hard' version of modules. The process will begin in the second half of this year. Once the plan has been refined together with our partners, I can share it with you in greater detail.

Thank you for this opportunity to exchange educational initiatives.

Mundie Salm

Editor, LEISA Magazine, and Coordinator, Farming Matters series,

ILEIA (www.leisa.info)

Europe etc.

Netherlands

(Submitted 7/05/'08)

Thank you for your message. As a (former) consultant for agriculture and horticulture development programs of FAO I fully support your statement. I now work with the University of Applied Science, HAS Den Bosch, in the Netherlands. As the name suggests, we focus on applied science in agriculture, horticulture, crop protection, animal breeding/production, applied research, and all aspects of food industry. The good thing about HAS Den Bosch is that there is a large network of cooperation with farming groups and industry, all students do projects in "real" practice, with enterprises like farms as well as industry. Teachers are practical people, usually with years of experience in farming and/or food-agri industry. We have a growing number of foreign students from many countries worldwide.

Most of our regular curricula are in Dutch language, but below I list a few English-language courses that can be taken by foreign students.

This information was given to me by our international office.

In addition to these regular courses, HAS has a separate unit called "HAS knowledge transfer" (- sorry for this - in FAO I worked for many years in many countries in farmer training through a participatory approach, mainly Farmers Field Schools, and I personally would support only participatory approach-type of projects in developing countries). This unit develops tailor-made training courses for trainees, based on assessment of needs. Content of training uses latest scientific knowledge (we do cooperate with agricultural universities) but is always translated into very practical topics and development of skills, as the "knowledge" needs to be applied into practice. Although this kind of training is often done for companies, I could imagine that this unit would also do training courses for foreign groups of e.g. farmers or extensionists, or do a training abroad on this basis. My own experience in establishing curricula for FFSs would be useful then.

Please let me know if I, or HAS Den Bosch, could be of any support to your/INSAM's initiative. If we could contribute in any way to assisting farmer communities in crop production or marketing and alleviate poverty I

would be very grateful.

Frederike Praasterink

On Bachelors level, HAS Den Bosch offers applied science training programmes in:

Horticulture and Business Management
Floriculture and Floral Design

On Masters level:

International Horticulture (offered jointly with Writtle College, UK)
Animal Biology and Welfare (offered jointly with Writtle College, UK)

In addition we offer two 10-week short courses:

- Animal Health and Welfare
- Export Management and Global Trade in Horticulture

Applicants for the bachelor programmes should have completed 6 years of secondary school education (till the age of 18) with mathematics, chemistry and biology as subjects at final year level.

Applicants for the master programmes and short courses should hold a relevant Bachelor's degree and preferably have some working experience.

All applicants are requested to submit a TOELF or IELTS test result in order to prove their English language skills. Application forms can be downloaded from the website of HAS Den Bosch www.hasdenbosch.nl.

Fees

Tuition fee for non-EU nationals in the bachelor programmes is approximately € 6800

Tuition fee for non-EU nationals in the master programmes is approximately £8000

Tuition fee for the short course is € 2750

HAS Den Bosch has a scholarship programme for non-EU students applying for one of the Bachelor courses. However, no full-scholarships are available.

HAS Den Bosch is the key training institute and a center of expertise in horticulture, floriculture and animal welfare. Personal attention, professional supervision and support, and high quality education are strong points of HAS Den Bosch which are recognized by many students and alumni. Students have the possibility building networks and benefit from the strong

relations that HAS has with the industry.

More information can be obtained from the International Office through international@hasdb.nl or www.hasdenbosch.nl

Europe etc.

Portugal

(Submitted 3/04/'08)

Here in Portugal, at the Irrigation Technology Center (http://www.cotr.pt/cotr_uk.asp) we are able, and it would be a pleasure, to receive some students that might be interested in the role of agrometeorology in water saving.

So, as you might know, our main use and concern with agrometeorology is to develop some useful tools for decision support systems (DSS) related with crop water needs to increase water use efficiency. Mainly we follow FAO methodology for that.

But we are also developing other tools like frost forecast (FAO methodology), plants grow related with temperature for better accuracy of crop water needs and chilling hours for fruit trees.

And our big concern ever, is related with those tools transferability to the farmer. We are developing the extensions services for better approach to farmer needs and deliverance of our tools.

Here, at our head quarters, we have several class rooms and bed rooms. We are 5 km distance from the city center - Beja, at the South of Portugal, in the middle of the new irrigation scheme.

The main communication languages are: Portuguese, English and Spanish. But in some specific cases it's possible to use French.

And, for last, the most important season with experimental and extension field activities is during the irrigation season (Spring and Summer), between March and the end of October.

Jorge Maia

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Europe etc.

Portugal

(Submitted 30/05/'08)

With regard to your message, we will be pleased to receive students that are interested in agrometeorological issues.

We are located at N.E. Portugal, close to the Port wine producing region (it produces table wines as well). Therefore, grapevine is a major crop around here.

We have been studying: stress indicators, physiological responses, evapotranspiration and its components for irrigation purposes, agroclimatic zoning, yield and quality parameters evaluation.... Generally, we want to study the responses of grapevines to water and climatic variability. Different instrumentation and sensors are used. Field work is essential.

The potential students we may receive will be integrated at the research projects we are involved. We do not have, however, funds for personal expenses (eg. food or rent).

Below are my contacts, if any additional information is needed:

Aureliano Malheiro, PhD
Dep. Plant Science and Agricultural Eng.
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Reply note from Kees Stigter:

many thanks for your reaction. Your approach does not sound very different from the usual scientific training approach.

However, where I was talking about was the "hands on" training that includes a "Farmers First" approach that takes the socio-economic issues into account and

uses field training for a direct handling of problems experienced by farmers in obtaining higher yields or protecting existing optimum yields.

Is there anything of that kind in your work and that of your institute?

Europe etc.

UK

(Submitted 3/04/'08)

It may be of interest to note that we are starting (from this October) a one-year MRes course in Crop and Environmental Science. This is run jointly between the University of Dundee and the Scottish Crop Research Institute (http://www.lifesci.dundee.ac.uk/MRes_CES).

It is targeted especially at students from developing countries and as well as attending the whole MRes, it is possible to concentrate on specific sections of the course that may be especially relevant and only attend those. The Plant-Environment interactions module may be particularly relevant to members of the Agromet-L group.

For further information contact s.f.hubbard@dundee.ac.uk

Lyn Jones

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Europe etc.

UK

(Submitted 24/04/'08)

Further to your e-mail I would like to inform you of what Cranfield University can offer in this area. We have a portfolio of postgraduate courses, short courses and research opportunities.

For details on postgraduate courses and short courses visit:

<http://www.cranfield.ac.uk/sas/aboutus/page10348.jsp>

For details of research activity visit:

<http://www.cranfield.ac.uk/sas/researchthemes/page9410.jsp>

I hope this is helpful.

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Reply note from Kees Stigter:

many thanks for your reaction.

I have had a look at the material. Much is of course "industry" and "western countries" or "richer parts of under-industrialized" countries related but there are also a few very useful "hands on" studies, particularly those related to water and sustainable development.

We will mention this all in the list we will make in due course.

