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Policy paper

Policy support for capacity building in weather and climate services focused on agriculture

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In talking about services, we must first distinguish (i) Agrometeorological (Advisory) Services (A(A)Ss), which handle the organizational aspects of (a) collecting and generating agrometeorological information, advisories and services with the participation of applied scientists and well differentiated farmers and (b) providing information, giving advisories and establishing services to/with farmers, and (ii) these agrometeorological services themselves as operational information products for various target groups of farmers, depending on their farming systems, their occupations and their levels of income and formal education.

The A(A)Ss will be part of the National Meteorological and Hydrological Services (NMHSs) but agrometeorological services as products, may also be generated by Extension Sections of Agricultural Research Institutes and Universities (which in the course of time may be called "Services Departments"). Co-ordination must be organized in strong collaboration with A(A)Ss. One always will have to deal with such organizational and institutional details but we may say already here that A(A)Ss should be organized as close to the farmers as possible, the way this is done in India as described below with respect to disasters. One important reason for this is that many agrometeorological services will have to do with coping with disasters (Murthy and Stigter, 2003).

In India effective and accountable local authorities are considered the single most important institution for reducing the toll of natural and human induced disasters (Sahni and Ariyabandu, 2003). The country's day-to-day administration is around the District Collector who is also in charge of all the relief measures at that level. There are sub-divisions and tehsils. The lowest unit of administration is the village. All these tiers function as a team to provide succour to the people in the event of disaster. It would be very helpful if indeed establishment of agrometeorological services could be guided at the lowest administrative level. However, collected examples in China show how far agrometeorological information still was from affected farmers' conditions and actual services there started only somewhat more than ten years ago (Stigter *et al.*, 2007).

In Maracay (Venezuela) last year's arguments were as follows (Stigter, 2008a). Solutions to farmers' problems with agrometeorological components are to be found in a combination of agrometeorology with an understanding of the livelihood of farmers in which agrometeorology has to be applied. This is where policy designs and policy preparations and policy implementations come into the picture.

FAO, UNEP, WMO have worked hard to involve developing countries (e.g. Gommes 2003; WMO, 2006). One may talk about a policy divide, characterized by two distinct dimensions involving policy development and implementation. Some regions have strength in both and others still struggle in both and several are in between. Without solving this policy divide, also in agrometeorology, livelihood of farmers will not improve.

Socialization and response farming

In the same paper (Stigter, 2008a), it was argued that socialization of agrometeorology means that policy matters of farmer oriented action support systems, policy support options and capacity building strategies should get attention. Opportunities for agrometeorological services to farmers should be the

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guiding principle (Murthy and Stigter, 2006). For each of these three farmer oriented policy fields, we should "prioritize" agrometeorological aspects of how to cope operationally with risks and uncertainties from and preparedness for four distinct subjects:

(i) extreme events and their consequences caused by meteorological and climatological disasters on all time scales, including related aversion attempts (e.g. Rathore and Stigter, 2007);

(ii) pests and diseases, including countervailing measures (e.g. Stigter and Rathore, 2008);

(iii) trying to use beneficial climate and weather; and

(iv) application of agrometeorological services themselves.

Each country has to do this in its own way for its own particular conditions.

Agrometeorological services are exemplified by agroclimatological characterization, design of microclimate management and manipulation, weather forecasting (including agrometeorological forecasting) and climate prediction, proposals of response farming, crop insurance and other advisories prepared for and by farmers, in the above mentioned three farmer oriented policy fields. For this to be possible, participative needs assessments should come first.

So far response farming was limited to rainfall events. But coping with weather and climate (and often soil) disasters as well as using windows of weather and climate (and often soil), further available opportunities are of responding to other forms of weather and climate (and often soil) realities. Climate change brings complications to organized response farming. But farmer and farming system-differentiation is the real issue of agrometeorological alternatives in agrometeorological services under conditions of a changing climate.

It was argued last year in Venezuela (Stigter, 2008a) and this year in the WMO-Bulletin (Stigter, 2008b) that new bags are necessary for old wine in response- farming related agrometeorological services. The old wine of response farming in its widest sense has been on the shelves already for a long time, but must now be presented differently. We must have in mind pre-existing inequities among farmers, new and better needs assessment and a focus on preparedness strategies (Rathore and Stigter, 2007).

Services

Analysis of the current state of affairs in agriculture shows that the adverse effects of nature can be handled, and that efforts to develop and apply technology for intensification in a variety of farming systems are under way, but that sustained adoption by the mass of smallholder farmers has not sufficiently taken place (Kuyvenhoven, 2008). See also Sachs (2005) and Stigter (2008c).

The need for capacity building on an institutional/ governance scale runs parallel with the need for capacity building on an extensive scale. Agrometeorological services can only really blossom in rural areas where also a "services climate" exists in other fields. Such "other fields" are for example improving education, health care, disaster preparedness and relief activities, infrastructure, credit facilities, agricultural input availabilities, markets, communication technologies. Policies and capacity building in these fields do matter very much.

This means that for the establishment of agrometeorological services one has to take the actual status of the other above mentioned facilities and realistically- projected progress/limitations into account. Such knowledge has to be collected as far as agrometeorology is affected. We must understand how our policies and capacity building in agrometeorology are related to these other fields and to the livelihood of farmers. Only then can agrometeorological products/ practices/ services be sufficiently feasible, attractive and justifiable and contribute to poverty alleviation.

Farmers' livelihoods

A good definition of livelihood is: "means to gain adequate stocks and flows of food and cash to meet basic needs, together with reserves and assets, to offset risks, ease shocks, and meet contingencies". Robert Chambers (1990) argued already long ago that in practice, the livelihood strategies of poor people, including resource-poor farmers, are often complex and diverse and can be different in the same village.

Stigter *et al.* (2007) showed that four different income-levels of farmers in China treated the technological and related information differently, and their levels of satisfaction were different too. Also, they appeared to receive the information largely through different channels. Stigter *et al.* (2007) also showed that when the villagers had similar occupations (planter, cultivator, businessman, village technician, village leader) their information requirements were close to each other, but different income type farmers used again different media channels to receive the information.

Because operational agrometeorology has to be carried out in relation to the livelihood of farmers, we must be on speaking terms with extensionists, anthropologists, and other agricultural and social scientists as well as development economists. The bridge between our fields of work and theirs, was very well built by Robert Chambers (1990) in his "Microenvironments Unobserved".

His approach explains why scientists, if at all interested in applications of their findings, come up with wrong solutions presented along the wrong communication channels and the exceptional potentially suitable answers communicated in insufficiently client friendly ways. The consequences of poverty and vulnerability are not clearly understood nor are the possibilities within farmers' existence.

This situation also explains Kuyvenhoven's (2008) earlier conclusions as well as the eight preliminary conclusions that I have recently drawn, as policy support issues, from the experiences obtained with the INSAM contest, including some cases not yet submitted (Stigter, 2008d).

Lession 1

Design rules of microclimate and water management solutions are more successful towards government institutions, if anywhere, than with farmers, because of missing education and extension programmes and facilities.

Lession 2

The same applies to shelterbelts and establishment of scattered trees in desertified areas, parklands and other agroforestry for protection from wind and blown sand, if local governments are serious.

Lession 3

Wrong assumptions and concepts are at the basis of wrong beginnings with the best intentions of attempts to help solve farmer problems.

Lession 4

Reviewing farmers' actual needs regarding the problems jointly selected to work on, is a necessary starting point using farmer centered questionnaires and group discussions.

Lession 5

Participation of farmers in developing the solutions and related services needed, is essential and imperative.

Lession 6

Farmer innovations and other results from farmers' experience/experiments have the largest chance of spontaneous dissemination.

Lession 7

To get beyond serving the initial target group of farmers, there is most often a missing link with other groups of farmers (with comparable problems) that are often badly or not identified.

Lession 8

In developing countries, public service providers (among intermediaries) can package crop disease warning systems as products of research into formats that fit farmers' needs; the latter are to provide feedback on those systems that are sufficiently valuable and user-friendly to the intermediaries (of whom some are researchers) for improvement (see below). Reliability of weather data inputs is the backbone for sustainability of such schemes (these last conclusions are based on work on crop disease warning systems by Gleason e*t al.* (2008).

Farmer field classes

These lessons lead to only one conclusion. Farmer/ Climate Field Classes would serve many purposes in applying all these lessons. After improving, adapting and focusing rural information and education systems, information and communication technologies (ICTs) could play very important roles in such capacity building and services (Stigter *et al.,* 2007).

In non-industrialized countries, training of intermediaries would go a long way in solving these problems for various groups of all but the richest and best educated farmers (e.g. WMO, 2009). Training programs at all levels must therefore be adapted to national and regional needs. In recent operational developments this includes developing extension around the establishment of agrometeorological services (Stigter, 2009). Particularly in all poorer (parts of) countries, intermediaries should there be the ones in direct contact with the agricultural communities (Stigter, 2008e).

The first kind of agrometeorological intermediaries would be close to the centres where the agrometeorological information (that would be useful to the decision-makers in agricultural production) is generated. The second kind of (agrometeorological) extension intermediaries should be closest to the farmers. They should learn to articulate the needs of the farmer communities better and detect agrometeorological components that need attention (Stigter, 2008e).

The weather services should organize (the contacts with) the first kind of intermediaries. The existing Extension Services, the Government and NGOs should organize (the contacts with) the second kind of intermediaries and their contacts with the farmers. The education and in-service training of these two kinds/ classes of agrometeorological extension intermediaries is an essential part of the new approach, that appears necessary in education, training and extension in agricultural meteorology (Stigter, 2003; 2008e).

And the stories on strategy come around full circle by proposing that these intermediaries be trained to address farmers in Climate Field Schools. In this perspective, Climate Field Schools can provide the missing links between farmers and the products from public, and in the future, for some subjects service providers, such as agrometeorological services.

For this to happen, the following seven requirements will have to be met as policy support issues (Stigter, 2008d):

I. large scale institutionalisation and funding of Climate Field Schools;

II. better needs assessments with the farmer groups that are organized for and by these Schools;

III. provision of better products geared to those needs and widely applicable in response-farming;

IV. higher official appreciation and better funding of extension services;

V. better training of product intermediaries with the public (service) providers to enhance client friendliness and suitability of these products;

VI. better training of extension intermediaries, between farmers and (service) providers, with public or NGO extension services;

VII. better professional and general education of farmers but coping (as per the above requirements) with such problems as illiteracy, vulnerability, poverty and the needed differentiation.

This would be policy support to capacity building. It must therefore be assumed that a policy consequence for post-graduate and other curricula is: attention for what intermediaries should be taught to assist farmers with agrometeorological services. This is the most urgently needed capacity building. This way all students get a feel for practicing agrometeorology fully in its ultimate applications.

REFERENCES

Chambers, R., (1990). Microenvironments unobserved. Gatekeeper Series No. 22, International Institute for Environment and Development.

Gommes, R., (2003). Agrometeorological policy between necessity and fashion. Eur. Soc. *Agron. Newsl.* 25, 4 pp.

Gleason, M.L., K.B. Duttweiler, J.C. Batzer, S.E. Taylor, P.C. Sentelhas, J.E.B.A. Monteiro, T.J. Gillespie, (2008). Obtaining weather data for input to crop disease-warning systems: leaf wetness duration as a case study. *Scientia Agricola* (Brazil), Special Issue, in print.

Kuyvenhoven, A., (2008). Africa, agriculture, aid. *NJAS* (Wageningen Life Science Journal) 55: 93 – 112.

Murthy, V.R.K. and C.J. Stigter, (2003). Stigter's diagnostic conceptual framework for generation

and transfer of agricultural meteorological services and information for end users. In: Agrometeorology in the new millennium - perspectives and challenges. Proc. of the Second National Seminar of the Association of Agrometeorologists in India, Ludhiana.

Murthy, V.R.K. and C.J. Stigter, (2006). Operational agrometeorological services for extension needs and the supportive role of agricultural research. In: Strengthening Operational Agrometeorological Services at the National Level, Proceedings of a Regional Meeting, Manila, Philippines, 2004. AGM-9, WMO/TD-No. 1277, WMO, Geneva (pp. 199-208). [Also available on-line at the WMO/ CAgM website].

Rathore, L.S. and C.J. Stigter, (2007). Challenges to coping strategies with agrometeorological risks and uncertainties in Asian regions. In: Sivakumar M.V.K. and Motha R.P. (eds.) Managing weather and climate risks in agriculture. Springer, New York (pp 53-69).

Sachs, Jeffrey, (2005). The End of Poverty. Economic Possibilities for Our Time. Allen Lane, London, 396 pp.

Sahni, P. and M.M. Ariyabandu, (2003). Disaster risk reduction in South Asia. Prentice-Hall of India, New Delhi

Stigter, Kees, (2003). The future of education, training and extension in agricultural meteorology: a new approach. In: Zheng Dawei *et al.* (Eds.), The Future of Education and Training in Agrometeorology in China, Proceedings of a Workshop, Beijing.

Stigter, Kees, (2008a). Coping with climate risk in agriculture needs farmer oriented research and extension policies. *Scientia Agricola* (Brazil), Special Issue, in print.

Stigter, Kees, (2008b). Agrometeorological services under a changing climate: old wine in new bags. *WMO Bulletin* 57: 114 – 117.

Stigter, C.J., (2008c). Agrometeorology from science to extension: assessment of needs and provision of services. Invited lecture at the 50th anniversary of the Chinese Academy of Agricultural Sciences, Beijing. Also: *Agriculture, Ecosystems and Environment* 126: 153 – 157.

Stigter, Kees, (2008d). Operational agrometeorology: problems and perspectives. In: Souvenir Booklet. CRIDA, Hyderabad, India, pp. 41-47.

Stigter, C.J., (2008e). Agricultural meteorology over the years, new priorities and consequences for curricula. Keynote Paper Presented in a WMO Expert Meeting in New Delhi (March 2007). In: Sivakumar, M.V.K., Hatfield J.L. (Eds.), Guidelines for Curricula in Agricultural Meteorology. WMO, Geneva, in print.

Stigter, C.J., (2009). Applied Agrometeorology. Springer, Berlin/Heidelberg,(in preparation_.

Stigter, C.J. and L.S. Rathore, (2008). How to organize coping with crop disease risks of farmers in poor countries. Paper presented at the Asian Pacific Network workshop of the APN project "Climate and crop disease risk management: an international initiative in the Asia-Pacific Region", Dhaka, Bangladesh, March 2008..

Stigter, C.J., Tan Ying, H.P. Das, Zheng Dawei, R.E. Rivero Vega, Nguyen van Viet, N.I. Bakheit and Y.M. Abdullahi, (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).

WMO, (2006). Commission for Agricultural Meteorology (CAgM). The First Fifty Years. WMO –No. 999. WMO, Geneva, 44 pp.

WMO, (2009). Guide to agricultural meteorological practices. WMO (3rd Ed.) 134, Geneva, in press. [Peer reviewed draft versions available at the WMO/CAgM and INSAM websites.]

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