Speeding up technology transfer through environmental pattern similarities using open data

Time: Tuesday, 22 April 2014, 12.00-13.00 **Venue: Queen Juliana**

- **Session lead**: Dr. Karl G. Gutbrod, CEO, meteoblue AG, Basel, Switzerland

- **Background** :

  meteoblue is a University of Basel, Switzerland, spin-off company, operating weather information systems, which model high precision weather data in hourly detail for the entire Earth since 2008. The meteoblue model chain and services are 100% operated with green energy.

  The company has cooperations with agricultural organizations in various countries, such as the Staatliches Weinbauinstitut Baden-Württemberg, Agrarmeteorologie Rheinland-Pfalz (DLR), Forschungsanstalt Agroscope Changins-Wädenswil (ACW), as well as Deutsche Landwirtschaftsverlag, Agrometeo Suisse, Conseil Interprofessionnel des Vins d'Alsace, and various companies in the agricultural sector in Europe, Asia and South America.

  meteoblue staff have 60 years combined experience in the agricultural sectors and environmental modelling across 5 continents, and meteoblue has an open data policy for research and relief purposes.

  meteoblue work is aimed at facilitating weather data access for multiple purposes at minimal or no cost, to foster development in agriculture and other sectors. The aim is to develop networks with organisations able to process and apply the data with local key actors and stakeholders from the public sector, the business & technology communities and academia.

- **Key challenge and opportunity :**

  how to identify environmental pattern similarities between developing (and developed) countries and find matching areas in developing countries to transfer the suitable technology packages (cultivars, seed, fertilizer, crop protection, irrigation) more rapidly.

  The process of transferring crops and practices from one region to another has been going on since the beginning of the agricultural history. Examples of large-scale (well known) success were the transfer of potato from South America to Europe, coffee growing from Africa to Brazil, Soybeans from North to South America, Maize from (mainly) North America to Europe and Asia. However, there have been many failures (rubber from SE-Asia to Brazil, soybeans from USA to Europa), cotton from India to Thailand and other SE Asian countries, and generally the process is very often a trial-and-error process, involving decades of testing, breeding, management practice and infrastructure development.

  Shortening this adaptation process and increasing the success rate would substantially reduce the time and money consumed, and increase the opportunities for developing countries as well as peasant farmers to improve their income and their livelihood.

- **Premisses :**

  The premisses of this approach are:

  1. it is possible to identify environmental pattern similarities between any country and region in the world by means of weather and soil data.
  2. weather and soil data are now available globally and in sufficient precision to permit precise recognition of environmental similarities and suitable cropping patterns.
  3. identification of high yield/ quality/ efficiency technology packages (cultivars, seed, fertilizer, crop protection, irrigation) is possible.
  4. assessment, choice, testing and transfer of the suitable technology packages will speed up the adoption process and rentability, and is therefore desirable.
  5. sufficient open data are available to apply this approach in various places.

- **Why this is so important :**

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Developing the agriculture of a country to it's full potential requires selection and production of crops which can successfully produced, processed and marketed, i.e. in a way which is economically profitable, as well as competitive compared to growing the same crop in surrounding or competing markets. If the technology is not suitable and competitive in practice, then (in today's relative open markets with low transportation costs), neighbouring countries will outcompete the suppliers from that country in the foreseeable future, and investment into the development of the crop and the related infrastructure will be lost. This process of mis-allocation and failure has happened in many instances over the past 30 years, and cost valuable resources and time.

- **What success would look like :**
  - Profitable adoption of a "ready to go" crop & technologies package from another countries in the target area within 5-10 years (instead of 30 years or more years).
  - Reducing number and cost of failures in transfer and implementation of crop packages.

- **Process to reach success :**
  1. Identifying the key agricultural regions in one country.
  2. Determining the key environmental characteristics (Weather and Soil) of that area.
  3. Search and identify similar environmental characteristics in other countries.
  4. Determine areas with best yield, quality and determine technology package used.
  5. Assess feasibility of transferring crop and technology package to target country.
  6. Assess, test and showcase the suitable technology packages in target area.
  7. Choice of the suitable technology packages and infrastructure support by stakeholders.
  8. Diffusion and implementation of the suitable technology packages.

- **Key objectives of the session :**
  1. to determine interest in this type of this concept.
  2. (if there is sufficient interest), to define stakeholders interested in applying the approach.
  3. to determine first steps – such as ways of collecting inventory of open data sources.
  4. (in the best case) to make suggestions for a test case (crops / countries).

- **Links to any relevant websites/datasets**

  Thornthwaite 1948: An Approach toward a Rational Classification of Climate. see http://www.unc.edu/courses/2007fall/geog/801/001/www/ET/Thornthwaite48-GeogrRev.pdf

  Climate Data source: http://www.ncdc.noaa.gov/cdo-web/

  Weather Data source: http://www.meteoblue.com/en_GB/weather/charts/archive/

  Concept Site with “ready to go” calculation: http://analogues.ciat.cgiar.org/.

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