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Cover photo: A female peasant holds the harvested early rice in the paddyfield in South China’s Hainan Province. (Lineair Fotoarchief BV)

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Introduction

The Centre plans its activities in cycles of five years, for which it receives core funding from its main sponsors. The reporting year 2005 was the first of the new 2005-2009 cycle, which enjoys expanded funding. While new activities were initiated, several projects conducted during the previous cycle came to completion. This annual report will present some highlights from these projects, illustrating the stance upheld for almost thirty years by now that this requires both rigorous theory and empirical verification.

Yet, to place these activities in proper context, the report starts with a brief update on the world food situation in 2005, followed by a discussion on how some of our work relates to the Millennium Development Goals that have become a common vehicle in the international development community for measuring the progress as compared to targets in specified areas (poverty, schooling, health).

World food situation in 2005

Just before the turning of the year, an earthquake east of Sumatra, Indonesia, triggered a devastating tsunami that caused an estimated 230,000 deaths and displaced more than 1.6 million people. Aceh in North Sumatra suffered by far the largest death toll, but parts of Thailand, India and Sri Lanka were also seriously hit. The tsunami resulted in an unprecedented mobilization of aid funds, with pledges for grants and loans to an amount of approximately 13 billion dollars. Soon this massive aid appeared to create its own problems in terms of allocation, actual spending and accounting of funds. By the end of 2005, many reconstruction works had started but large sums still had to find appropriate use.

In October 2005, another major disaster followed as a large earthquake struck Pakistan with a death toll of over 70,000, leaving about 3 million people homeless. There were large losses of livestock, irrigation facilities and other infrastructure, and immediately after the disaster about 1.5 million people were in direct need of humanitarian assistance. In this case also the international community reacted vigorously, with donations and pledges amounting to ap-
proximately 6 billion dollars. For example, both the tsunami and the Pakistan earthquake resulted in major food aid operations by international organizations such as the World Food Programme (WFP) and the International Red Cross. At the peak of the tsunami operations, WFP provided food aid to over two million people in six countries.

Yet, despite the enormous impact of these disasters on the people in the affected areas, the consequences on the overall food situation and the performance of the agricultural sector in these countries were, at national level, moderate or even negligible, witness the modestly increasing trend in total cereals production in Indonesia and Pakistan that was not halted or reversed in 2005.

![Figure 1. Per capita Food Production Index, developing regions, 2000-2005](Source: FAO, 2006)

When considering agricultural performance in 2005 from a more global perspective, the overall picture was satisfactory, with total world food production practically matching the all-time record of 2004. Total cereals production in 2005 has been estimated at approximately 2200 million tonnes, only slightly below its 2004 level, and total meat production at about 265 million tonnes, which is just above its 2004 level. Cereal prices remained practically unchanged as well, despite the continuing increasing trend in world energy prices. As a result of these globally favorable levels of food production, the world’s aggregate cereal stocks could be maintained at approximately 20 per cent of global annual utilization. Yet, there are considerable differences between regions in the world. On the basis of the per capita Food Production
Index, an aggregate measure of total per capita food production in a country or region, over the past years the most significant improvements were realized in China, East and South-East Asia and Latin America. However, per capita food production remained practically unchanged or did even deteriorate in South Asia (India) and Sub-Saharan Africa (Figure 1).

**GMOs and biofuels**

In connection with global trends in agricultural production, two specific types of products deserve special attention: genetically modified organisms (GMOs) and biofuels. GMOs have shown a steady and fast rising share in the global production of crops such as soybean, maize and cotton. While in 1996 the total area in the world planted with GMOs was between one and two million hectares, by the year 2000 it had reached over 50 million hectares, and within one or two years from now the 100 million hectares mark will, most likely, be surpassed (Figure 2). With a total global arable land use of approximately 1400 million hectares, nowadays about 7 per cent of the arable land is under genetically modified crops.

![Figure 2. Global Area Genetically Modified Crops (Source: GMO Compass, 2006)](image)

GMOs have advantages over conventional crops, such as possessing higher resistance against insects, lower requirements for pesticides or herbicides, and a lower stress sensitivity (e.g. to drought). Yet, application of GMOs remains highly controversial, with the opponents pointing to possible negative effects
on the ecology as well as on human health.

In terms of area cultivated, soybean is by far the most important GM-crop, followed by maize, cotton and rapeseed. As shown in Figure 2, the USA, Argentina, Brazil, and China are countries with the largest areas under GMOs. For soybean worldwide, the share is about 60 per cent. For maize, cotton and rapeseed, these shares are 28, 14 and 18 per cent, respectively. Clearly, whether considered desirable or not, GM-crops are gradually gaining in importance in global agriculture, particularly in the production of animal feeds, in response to fast-rising meat demand.

Over the years, the European Union (EU) has been reluctant to accept imports and to allow the production of GMOs in its member states, and it is only since 2003 that what practically was a moratorium on GM-crops was lifted as the EU relaxed its highly restrictive import regulations for GM-products. Still, acceptance by European consumers of products in which GMOs are incorporated is low, and actual human consumption of such products is almost negligible albeit that at the same time, resistance against use of GMOs in animal feed is far much less pronounced, and the EU now imports significant amounts of GM-soybean products for its livestock sector.

The Centre encounters these issues mainly in its research on food demand worldwide and on agricultural policy issues in the EU and in China, and merely takes note of the fact that the livestock sector worldwide would encounter significant difficulties in the absence of GMO-oilseeds but that the direct relevance of GMOs to the poorest developing countries, whose livestock sector does not rely on purchased feeds, has so far been limited.

A second remarkable development in global agriculture is the rapidly increasing production of ethanol from crops such as sugar and maize, in parallel with the rising use of agricultural residuals in general for biofuel production in various other forms, including biogas. Already during the mid 1970s, Brazil embarked on ethanol production from sugar, to reduce its dependence on oil imports. During the 1990s, progress in this area stagnated, mainly in response to falling world prices of oil and sharply rising world sugar prices. However, in recent years interest in the production and utilization of biofuels has been rising again as oil prices soared. In addition, environmental reasons such as the need to reduce CO₂ production as well as the need to contain discharges of manure, offer motivation for reverting to non-fossil fuel based energy sources.
With regard to CO\textsubscript{2}, combustion of biofuels clearly also releases CO\textsubscript{2} but only the quantity that was fixed via photosynthesis by the crop. The use of biofuels keeps more fossil fuels and hence more CO\textsubscript{2} in the ground.

Consequently, many countries are now actively pursuing policies to promote biofuels. For example, the EU is considering mandatory minimum requirements for biofuels in terms of their share in total fossil fuels use but here as in most other developed countries use of crop residuals and manure as raw material seems more promising than cultivation of energy crops as such.

![Figure 3. Ethanol production, World Total, USA, and Brazil (Source: Murray, 2005)](image)

As shown in Figure 3, by the year 2005, the global ethanol production amounted to almost 9 billion gallons, with a rapid increase in particular in most recent years, and with Brazil and the USA being the main ethanol producers, respectively from sugar and maize. In Brazil, one of the largest sugar producers in the world, currently about half of all sugarcane production is being used for the production of ethanol. Motor vehicles in Brazil are increasingly equipped with so-called “flex-fuel” engines, which can run on any mixture of ethanol and petrol, and most cars run on a mixture consisting of 75% ethanol and 25% petrol. About 12% of all maize production in the United States is nowadays used for the production of ethanol.
From a world food perspective, there is no doubt that a rising demand for biofuels from crops would, just like the demand for animal feeds from GMO-crops or otherwise, compete with food crops for human consumption, primarily cereals and root crops. At the same time, we have seen that world cereal prices so far remain stagnant in dollar terms. Hence, they do not even follow world inflation, let alone the fast rising prices of other raw materials, such as steel and oil. Hence, it would seem that so far the competition is limited in that there still is sufficient room for expanding agricultural production. Be this as it may, eventually the fast-rising supply of meat and biofuels is bound to reach its limits, particularly if the world succeeds in realizing the Millennium Development Goals.

**ODA and MDGs**

The trend of increasing aid flows to developing countries, which set in towards the end of the 1990s, was also maintained in 2005. In this year, total Official Development Assistance (ODA) amounted to an estimated 106.5 billion USD, 30% higher than the previous year. The increase is to a large extent the result of major debt cancellation operations, in particular for Iraq and Nigeria. However, also other (non debt relief) forms of aid increased significantly by almost 10% between 2004 and 2005. Figure 4 shows that over the period 2000-2004, ODA to Sub-Saharan Africa almost doubled from about 14 billion to over 26 billion USD. One particularly important event in 2005 was the G8 conference in July in Gleneagles, Scotland, where various pledges for increased aid were made, including significant debt cancellation and a commitment to double financial aid to Africa by the year 2010.

While aid to Sub-Saharan Africa is now higher than to any other region in the world, both in absolute amounts and on a per capita basis, the persistence of a high flow of aid to countries in Eastern Europe and Central Asia is remarkable. Although on average aid to these countries, on a per capita basis, is lower than to countries in Sub-Saharan Africa, it is significantly higher than to countries in the Asian and Pacific region or to countries in Latin America and the Caribbean.
In its Millennium Declaration of September 2000, the United Nations adopted the Millennium Development Goals (MDGs) to be expressed as explicit quantitative targets, to be reached in 2015 through concerted efforts worldwide.

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a partnership for development

By 2005, the MDGs and associated development targets have started playing an important role in monitoring development as well as in mobilizing funding. With respect to achievements, the year 2005 generally continued the prevailing trend. While significant progress can be observed in reducing poverty and hunger on average at global level, most of the progress is on the account of the extremely fast economic developments in China, and to a lesser extent in South Asia. Also in the area of child health (infant and child mortality) and education, there are major improvements on a global level, although in most recent years progress appears to be slowing down.
Also with respect to one of the most serious health problems, HIV/AIDS, in Sub-Saharan Africa the number of (adult) people being infected appears to stabilize at approximately 8%, but with marked differences between countries. In some countries, over the past years significant progress has been made in containing the disease. For example, in Uganda and Kenya prevalence rates are gradually going down, and adult HIV/AIDS prevalence rates are now in the order of magnitude of 5–8%. Yet, in South Africa the epidemic has been rising at an astonishing rate from a relatively low 1% adult HIV/AIDS prevalence in 1990 to over 20% by the year 2003. Also in Mozambique the epidemic appears to be still expanding, with the adult prevalence rate increasing from 14% in 2002 to 16% in 2004.

![Graph showing trends in HIV/AIDS prevalence](image)

*Figure 5. Trends in HIV/AIDS prevalence in adults aged 15–49 in Sub-Saharan Africa and all developing regions (Percentage) and number of AIDS deaths in Sub-Saharan Africa (Millions), 1990–2004 (Source: UN, 2005)*

Other regions in the world where developments with respect to HIV/AIDS are a serious concern are Eastern Europe and Central Asia, with countries such as Ukraine, Uzbekistan and Kazakhstan facing rapidly increasing prevalence rates of HIV/AIDS. Finally, remarkable is the North Africa and Middle East region, where HIV/AIDS is still relatively low at 0.2%, and among the lowest rates in the world. The only region in the world where it is lower is East Asia, with in China still a very low rate of HIV/AIDS prevalence, mainly among drug users and through blood transfusion. Although the Centre does
not have particular expertise on human diseases, it seeks to account for their incidence and effect in its research, particularly at household level.

The MDG-initiative goes far beyond stating targets to monitor progress. It also formulates explicit financial requirements for achieving the goals, implicitly suggesting that money is the bottleneck. However, it may be recalled in this connection that, on a global scale, most progress made over past years towards achieving the MDGs is to be ascribed to the rapid economic developments in China and, to some extent, India. These favorable developments are not the outcome of financial aid. More likely explanatory factors are long-term national investments in education, health and infrastructure, freeing of foreign trade, and allowing the import of foreign technology and expertise. In both China and India, growth started from strongly urbanized centers (coastal areas in China, western and southern urban centers in India), with ample supply of low cost labor from the rural areas to these growth poles. These developments take place at subcontinental scale and build on strengths rather than resolving all problems at less performing locations. They may well teach important lessons for Sub-Saharan Africa as well. Already now, the South African region appears to be in a process of sustained economic growth, and may well develop into the first major growth pole of the continent. The next candidate could well be Nigeria and neighboring countries.

Thus, in the amounts as set by the MDGs, increasing financial transfers may well contribute to development, and in particular to reducing poverty among the poorest populations in the world. But, they are likely to bear fruit on a longer than fifteen year horizon, and other factors in the overall development process, related to national investments and international trade, are probably more decisive for long-term development than aid can ever be.

**SOW-VU’s research**

Several of the issues and developments described above figure, directly or indirectly, on SOW-VU’s research agenda. In January 2005, the Centre completed the Chinagro project by presenting the model description and the model scenarios at a policy workshop in Beijing. Based on a detailed description of Chinese agriculture, including a wide variety of agricultural inputs and outputs and its pricing, it was shown how pressure from food demand on the Chinese agriculture is building up, driven by strong income growth and consumption
of higher-valued products. More openness of trade, as part of the WTO accession, plays a pivotal role and Chinese policy makers are faced with the policy option whether to improve raw materials production (feed) or import finished products (meat). More details on these findings were already included in the 2004 Annual Report.

The scientific cooperation in the Chinagro project has evolved into strong partnerships with various Chinese counterparts. This cooperation is to be continued in 2006 and beyond, when the current model base will be documented, updated and enlarged. Indeed, a sizeable follow-up project in which SOW-VU acts as co-ordinator has by now been selected for funding under the EU’s Sixth-Framework Program and the Netherlands Ministry of Agriculture has in connection with the Minister’s visit to China made additional commitments as well. The participating institutes intend to address the most pressing development issues that China is facing, i.e. concerns about the environment and resource use, and about income distribution, and to study the agricultural relations between China and the EU. Co-operation along similar methodological lines has also been requested from Bangladesh, where the Centre had active and long-lasting involvement in the past, and attempts will be made to proceed on this.

Apart from this, most of the efforts will be directed to Sub-Saharan Africa, with projects on water management, vitamin deficiencies, soil fertility, price-weather insurance and food aid delivery.

The next section highlights some of the results obtained so far in this food aid project that is being conducted at continental scale. While the project has started with the aim to find out how food aid is procured and shipped to its recipients, while looking for opportunities to improve the effectiveness of the process and to identify the scope for procurement of food aid on local markets, it was soon realized that the scope of the exercise had to be much broader. Indeed, a large database at grid cell level has been built for the whole continent, based on diverse information on infrastructure and transport costs, food consumption and nutritional status, production possibilities and trade, and various specific issues, such as the location of refugee camps. The food aid model that operates at this scale is envisaged to map out the efficient allocation of food aid. It also prepares for investigating the role of infrastructure and for assessing how important the often quoted but rarely substantiated “supply constraints” really are.
After this, some of the outcomes of the Rural Poverty Study conducted for the International Fund for Agricultural Development (IFAD) in Syria, will be reviewed briefly.

References
Towards a Food Atlas for Sub-Saharan Africa: food availability, deficits and aid deliveries

Even though food aid cannot offer the solution of the problems of Sub-Saharan Africa, it definitely has been contributing significantly to the alleviation of its most acute food shortages. Yet, as is well known (see Barrett and Maxwell, 2005, Clay and Stokke, 2000), inappropriate use of the instrument can be detrimental as well. Oversupply of imported food aid may discourage local production and, through pressure on domestic prices, can make it even more difficult for local farmers to survive adverse weather conditions and the aftermath of calamities. Excessive domestic procurement may foster speculation by traders and cause price hikes that may be particularly pronounced in some regions in view of the limited capacity of trade and transport infrastructure to smoothen out local deficits. Furthermore, the quality standards and the administrative requirement on tracking and tracing of shipments may amplify this volatility by making it harder for local producers to compete with traders that are able to supply high quality in large quantities. Add to this the question whether food aid should be given in kind, in the form of the major commodity consumed by intended recipients or of some valuable commodity such as vegetable oil, or in cash and it becomes very clear that, combined with the urgency of recipient needs, the provision of food aid is a very subtle issue that calls for dedicated decision support tools. Ideally, such tools should, on the basis of the latest information about the current availability of staples on the fields and in stocks as well as about the nutritional status and the purchasing power of the recipient population, enable the agencies in charge to coordinate their actions along the chains of delivery and to anticipate the impact of the operations on local markets.

Remarkably, despite the critical importance of adequate management of these flows for the livelihood of many, the empirical information collected has so far not been incorporated in such decision support tools. This has motivated research to develop a spatially explicit model for the optimal delivery of food
that could, in principle, account for detailed high-resolution information on the prevailing food situation across Sub-Saharan Africa, and assist the agencies involved, from the donor down to the actual operations, in identifying pockets of food insecurity, and in suggesting sources for local procurement as opposed to foreign imports, while taking into consideration the trade and transport network available. The model resolution will be 5 arcminutes (about 10x10km), and it distinguishes between locally produced and consumed food, commercially traded food and food aid. In every cell on the grid, consumers and producers decide whether to buy or sell food, depending on market clearing prices and purchasing power. Demand for commercial food and food aid leads to flows of these goods from grid to grid, with transportation costs determining the optimal sourcing and route to be followed.

This decision support tool is not meant as a substitute for ground knowledge on the logistics of actual deliveries or for the operational experience of the agencies in emergency operations. Rather, it intends to provide a bigger picture of the prevailing food situation, by accommodating detailed information on consumer needs, agro-ecological conditions, international and local trade and the capacities of the various delivery channels. Hence, one of the major strengths of the tool is the comprehensive integration of various data sources into a single framework, while the possibility of graphically reproducing the data by means of maps facilitates easy communication with policy makers and experts in the field.

In 2005, much efforts were spent on the development of the underlying database. It consists of data for each grid cell covering the whole of Sub-Saharan Africa, compiled for the year 2000 on the basis of information from a vast array of sources, with possibilities for update to later years. These include maps (i.e. data at grid level), but also data at district, province, and country level. Dedicated software was developed to conduct the task of managing the data from the original source down to the geographic maps. Here, we only highlight two elements of the database: the representation of infrastructure and transport costs in Sub-Saharan Africa, and the estimation of consumption per capita and by cell.
Lack of adequate infrastructure is often mentioned as one of the primary problems of Africa. It impedes commercial trade in (food) crops, but also presents a serious problem when emergency aid has to be transported from import harbors to the people in need. Hence, one of the major challenges within the project was the compilation of a single consistent map of infrastructure in Africa, including primary, secondary and tertiary roads, coastal sea routes, inland waterways and railways. Although road maps were available for the African continent in digital format, different definitions of road quality seemed to have been applied for different parts of Africa, leading to large differences in road densities that could not be explained by economic or historical reasons. Hence, use of other (hard-copy) maps was made to correct the initial digital maps for these definition differences. For railways, additional data were gathered on the actual operation of lines; for example in Angola, only a part of the available Benguela railway could be used because of destroyed bridges and landmines until its very recent reconstruction. Such information obviously is important, since in this case, simple representation of available physical infrastructure would lead to a serious overestimation of the possibilities for transport. The same holds for points where roads are crossing rivers or ferries have to be used for transport over lakes. Here, an assessment of the capacity of bridges and ferries had to be done, again to avoid overestimation of the transport possibilities.

Secondly, differing transport costs are associated to different types of infrastructure, and a second major task therefore was to translate infrastructure availability to cell-by-cell costs. Estimation of transport costs uses the infrastructure maps with different categories as point of departure, and corrects for the presence of landmines (ICBL, 2001), for general safety in a country as measured in the Aggregate Governance Indicators dataset (World Bank, 2006), and per capita GDP. Prohibitive costs at border crossings for countries at war are based on the Uppsala conflict database (Uppsala University, 2006). Maps 1 and 2 show the main corridors connecting Africa and the secondary roads on the continent.
Map 1. Primary roads in Africa

Map 2. Primary and secondary roads in Africa
Both maps highlight a number of characteristics of the African continent. First, far from being one integrated whole, different more or less integrated regions can be recognized, in particular West Africa, and South-East Africa, while the regions only have sparse connections with each other. Secondly, the density of corridors and secondary roads is very low in the heart of Africa (including the Democratic Republic of the Congo, Central African Republic, Angola) and equally low in the Sudan and Somalia. Many of these regions have been or are still largely dependent on food aid deliveries, and the lack of a well-developed infrastructure implies that costs of reaching the people in need are high. We return to this point in the box on refugees in Africa.

**Estimation of consumption**

The estimation of consumption is based on recorded weights of women and children in the Demographic and Health Surveys (DHS) carried out for USAID in the majority of the African counties. To go from recorded weights to calorie intake, conversion formulas from weights to calorie from FAO (2004) were used, while updating of these results to the base year 2000 and imputation of missing countries was done using data on the Human Development Index ranking (UNDP, 2001).
Map 3 shows the estimation of per capita calorie consumption for Sub-Saharan Africa thus calculated. The resulting estimates for consumption differ substantially from consumption estimates by FAO that are based on calorie availability. This result is consistent with the observation that the direct measurement of undernutrition through the weighing of people (as in the DHS surveys) leads to a substantially lower percentage of undernutrition than the official estimates by FAO (see Figure 6). We note that for children, the differences between the FAO/UNICEF estimates and DHS-based estimates of undernutrition are much less pronounced since, for children, FAO/UNICEF estimates are also based on direct weighing. In 2006, a scientific paper will appear in which the procedure for estimating the consumption is explained and defended.

**Figure 6. Number of undernourished. Comparing FAO with DHS-based estimates**

In 2006, an atlas with maps for Sub-Saharan Africa will be compiled to be distributed on CD-rom, consisting of ‘zoomable’ maps (i.e. zooming in on a particular spot until grid values become visible) supplemented with tables, and explanatory text. The Atlas is an intermediate milestone towards the completion of the full decision support tool and comprises three parts, namely the database, where the main steps in the process of database construction are highlighted and results shown; the calibrated model, which adds to the database the flows among sites and the price relationships induced by these flows; and indicators, where special indicators of interest to WFP will be elaborated upon. Follow-up applications could focus on a particular region or country groupings, making it possible to incorporate more detailed and reliable infor-
mation. Scientific outputs will include background papers that describe the methodology of the consumption estimates used in the project.

References
WFP (2006) Various emergency reports, estimated food needs, special reports available at www.wfp.org
Africa is a continent plagued with wars and internal unrest, leading to a large number of refugees and internally displaced persons. The continuing prevalence of conflicts has led to the tragic situation where many refugee camps have now an almost permanent nature. These camps vary in size, but many are the size of large towns or even medium size cities. The vast majority of these refugees totally depend on food aid for their survival, and therefore, the refugee population presents a continuing challenge for WFP and other organizations in terms of getting the aid to those in need, often through unsafe areas, from ports thousand or more kilometers away from the camp.

Figure B1 shows the number of refugees that are registered in camps per region and in total for Sub-Saharan Africa (note that most internally displaced persons are excluded from this total, since they often seek refuge with relatives instead of fleeing to camps). The figure also shows the location of refugee camps in Sub-Saharan Africa. For reference, we include the main roads to show the links of these camps with import harbors.

For the project, data from UNHCR (2001, 2002) on the location and population of refugee camps and the origin of the refugees was used, while total food aid deliveries were taken from the FAOSTAT database (FAO, 2006a), and INTERFAIS (2006). Total consumption of food aid in refugee camps is based on information on rations provided by WFP (2006).
The International Fund for Agricultural Development (IFAD) contracted SOW-VU in 2003 to perform a study on rural poverty in Syria in order to focus its activities more on poverty reduction, while expressing its special interest in where the rural poor live and how they can be supported in their economic development. The Centre attaches particular importance to this project, because so far little statistical information was available on the condition of rural households in this country.

A major part of the project consists of conducting and reporting on a survey among 30,000 rural households all over Syria, executed in cooperation with the Agricultural Extension Directorate (AED) of the Ministry of Agriculture and Agrarian Reform in Damascus.

During 2004, the survey questionnaire was developed and the actual survey was implemented. Early in 2005, a training was given in Damascus to AED staff from all provinces in the entry of survey data on the computer. During the subsequent visit to AED in April the resulting Excel data files have been converted and integrated into a SAS database. Subsequently, data processing and analysis at SOW-VU started in May 2005. As could be expected for a survey of this size, data cleaning and tabulation was already a considerable task. In the analysis, rural households have been classified as poor according to several poverty indicators: their per capita expenditures, their expenditure share of basic food, their consumption frequency of luxury food and their durable household items, such as a television, refrigerator or washing machine. Considerable similarities in the spatial patterns of poverty prevalence according to these four indicators were found. The characteristics of poor households, classified according to their durable household items indicator, were compared systematically to those of non-poor households. Attention was paid to their economic assets, such as human capital, land and livestock, to their market environment, income sources and debt situation, as well as to their housing situation, their access to social services and to specific women topics. The draft version of the report resulting from the analysis of the survey data in combination with other available information was finished early in 2006, and submit-
ted for comments both to IFAD as well as to the AED team and the supervising National Project Committee in Damascus. The findings of the study are not yet released for publication.

An important and innovative aspect of the study, was the spatial presentation of survey results in maps. Since location information was collected for each Extension Unit involved in the survey, data aggregated by Extension Unit could directly be shown in a map of Syria. To extract a spatial pattern from the Extension Unit data, an interpolation method was developed that incorporates available spatial information on correlated variables, while maintaining sufficient spatial detail. To this end, the Syrian rural area is subdivided in numerous small grid cells, and for each grid cell an estimate of the variable of interest is made based on the similarity between the actual grid cell and the set of grid cells for Extension Units, for which the survey data are known. These grid estimates can be shown directly in a map, as well as be used for a consistent weighted aggregation to province or national level. In the application to the survey data, the Mollifier method is used for interpolation, while taking both location variables (latitude and longitude) as well as spatial data on population and rainfall into account. Map 4a shows survey data for the Extension Units, while map 4b shows the corresponding grid (non-parametric) estimates.

Map 4a. Spatial representation of survey results
Map 4b. Spatial representation of survey results

The results of the study are to be reported to IFAD in 2006, and workshops are scheduled to take place to disseminate the findings within Syria.
List of staff members

The following staff members were working at the Centre by the end of 2005:

Martha Bakker       Geologist
Bart van den Boom   Economist
Michiel Keyzer      Economist/Director
Rian Kriesels       Secretary
Andrey Lizyayev     PhD-student
Max Merbis          Economist/Deputy director
Vasco Molini        Economist
Maarten Nubé        Nutritionist
Geert Overbosch     Economist
Saket Pande         Economist
Huanguang Qiu       Economist
Ben Sonneveld       Agronomist
Kees Traas          Administrator
Wim van Veen        Economist
Roelf Voortman      Ecologist
Lia van Wesenbeeck  Economist
The Scientific Advisory Committee convened at December 22, at their annual meeting. At the start of the new five-year cycle several new members were present, and the meeting started with a quick overview how issues from the world food situation lead to research questions and how the Centre operationalizes them. Subsequently various staff members presented specific topics in applied projects, covering policy issues for the CAP; new results for the measurement of undernutrition in Sub-Saharan Africa; the achievements in the Jordan River Basin project as laid down in the final report to the financing
institution; and results for the Syria project. In addition the latest developments in the Centre’s tool kit on non- and semiparametric estimation were explained, which are the key to the spatial approach that figures prominently in many projects. The committee commented on the empirical strength of the approaches, and in particular endorses the choice of the specific fields of application.
Accounts and result for 2005

Key figures of SOW-VU’s Balance per December 31, 2005

Assets
Fixed assets € 26,208
Current assets € 499,329
Liquid assets € 239,212

Total Assets € 764,748

Liabilities
Capital € 183,221
Provision for termination payments € 190,577
Provision for vacation rights € 71,546
Current liabilities € 319,403

Total Liabilities € 764,748

Key figures of SOW-VU’s Operating Account 2005

Outlays
Research activities € 991,021
Specific material expenses on research € 50,319
Institutional costs € 53,290

Total Expenses € 1,094,630

Income
Subsidies:
- Ministry of Foreign Affairs € 627,546
- Ministry of Agriculture € 150,000
- Vrije Universiteit € 163,392
Other income € 213,208

Total Income € 1,154,143

Result € 59,513
Publications and activities, 2005

The Centre’s research output is split into academic (refereed) and professional publications, followed by a selection of other activities related to education and capacity building efforts. Downloadable publications can be found at the Centre’s website http://www.sow.vu.nl.

Academic publications

Keyzer, M.A., M.D. Merbis, I.F.P.W. Pavel and C.F.A. van Wesenbeeck, ‘Diet shifts towards meat and the effects on cereal use: can we feed the animals in 2030?’.


Voortman, R.L., ‘Factors affecting soil moisture availability on Sudano-Sahelian coversands’, ‘Models of conservation agriculture – conclusions and implications’, ‘Environmental conditions, the need to understand operating mechanisms and

**Professional publications**


**Working papers**


**Book Reviews**


**Conference, seminar, workshop**


Keyzer, M.A., presenting ‘Spatially explicit, multi-commodity welfare models and their use at the Centre for World Food Studies’ at ZEF (Center of Development Research), University of Bonn, March 2005


Keyzer, M.A., director’s lecture ‘Algorithms for combined use of censuses, maps, surveys and district data: rule-based and SV-regression approaches’ at IIASA’s Methodology Forum, Laxenburg, Austria, 19 July.


Keyzer, M.A., invited paper ‘Over de vaststelling en handhaving van normen ten aanzien van de productiewijze van voedingsmiddelen’ diner parlement with discussions on the sustainability of free trade, organised by Novib, FairFood and Stichting Natuur en Milie, Amsterdam, 12 October.

Molini, V., presenting ‘The evolution of food security during an Period of Economic Boom: Vietnam in the 1990’s’ at project meeting on ‘Hunger and Food Security: New Challenges and New Opportunities’, UNU-WIDER, Helsinki, 12-14
October.
Sonneveld, B.G.J.S., presenting ‘Food crisis management in Sub-Saharan Africa: a bird’s eye view of the continent’ at the conference ‘Food and Rural Development: Global and Local Perspectives’ at Trent University, Canada, 11 March.
Sonneveld, B.G.J.S., invited participant GEO-4 Chapter 1 & Human Well-Being Meeting, United Nation Environmental Programme, Nairobi, 28 – 29 September.
Sonneveld, B.G.J.S., Rivertwin Mid-Term Review Workshop. Cotonou, Benin, 2 – 6 October.

**Lectures**

Keyzer, M.A., lecture ‘Het Wereldvoedselvraagstuk’ at FEWEB Course ‘Interfacultair Keuzevak Ontwikkelingsvraagstukken’. Amsterdam, 10 November.
Nubé, M., lecture ‘Food security and malnutrition: current situation and trends in the rural and urban setting’ at IAC/WUR Course ‘Household Food Security From A Sustainable Livelihood Perspective’. Wageningen, 10 October.
Nubé, M., introduction and panel member ‘De meerwaarde van een Voedingsdeskundige’. Studiekring Voedsel en Voeding in Ontwikkelingslanden (SVVO), Wageningen, 28 September.
**Education**

Nubé, M., member examination committee ‘Training Programme on Food and Nutrition Security’ (diploma course). International Agricultural Centre/Wageningen University & Research Centre, Wageningen, 24 November.


Overbosch, G.B., data entry training Agricultural Extension Directorate (AED) of the Ministry of Agriculture and Agrarian Reform, Damascus, 17 - 18 January.

Sonneveld, B.G.J.S., member of the PhD Commission of Tan Shuhao, ‘Impact of land fragmentation on rice producers’ technical efficiency in Southeast China’ University of Wageningen, 6 September.


**Advisory Work**

Keyzer, M.A., external assessment of Dr. Adeola Adenikinju for the position of Reader at the University of Ibadan, Nigeria.


Keyzer, M.A., ‘The PSE once more’ a comment on the use of PSE in consultation with OECD’s Director of agriculture, LNV/IZ and Wageningen University (Agricultural Economics and Rural Policy Group).

Keyzer, M.A., ‘Bijdrage bevolkingsstelling Fairfood’ comment on the Fairfood website proposition ‘Population growth is causing hunger’.

Keyzer, M.A., ‘Tailor made solutions needed’, comment on Fairfood website proposition ‘Hunger problem can be solved by increasing agricultural production’.

Keyzer, M.A., invited comment on statistics FAO to Deputy Director General.

Keyzer, M.A. and B.G.J.S. Sonneveld, invited contribution natural resource valuation GEO-4, UNEP.

Keyzer, M.A., invited comment on long term perspectives document WOTRO/NWO.


Merbis, M.D., member of Advisory Group ‘Provision of Statistical Services for Agricultural Sector Modeling’, Eurostat, Brussels, 18 January, 19 April, 26 October.

**Traineeships/visiting researchers**

Prof. dr. V. Norkin, Institute of Cybernetics of the Ukrainian Academy of Sciences, counterpart methodological development, March and May.

Gifty Amankwah-Gosu, Ghana Statistical Service (GSS), training, 12-24 September.

Matthew Datsomor, Ministry of Trade and Industry, Ghana, training, 12-24 September.

Prof. dr. Laixiang Sun, School of Oriental and African Studies, University of London, Chinagro project cooperation, 26-28 September

Dr. Y. Ermoliev, IIASA, counterpart methodological development, 17-20 May.