ENDING RURAL HUNGER

Mapping Food Security Assistance in Malawi

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With the expiration of the UN Millennium Development Goals in 2015, the international community now has the opportunity to take stock of progress and reevaluate current methods of measuring reductions in global hunger and food insecurity. Many of the post-2015 Sustainable Development Goals (SDGs) have called for a data revolution to address these and other measurement challenges. This brief outlines in practical terms advances we have piloted at the University of Texas that could potentially be adopted as part of the SDG efforts.

In the field of food security, progress over the past five years in aid transparency and geographic information system (GIS) mapping has provided enhanced tools for tracking the allocation and effectiveness of foreign aid for food security. In 2013, the Climate Change and African Political Stability Program (CCAPS) and Innovations for Peace and Development (IPD) at the University of Texas, in collaboration with Development Gateway, expanded our previous efforts around multi-donor aid mapping[1] to track food security assistance in sub-Saharan Africa.[2] Here, we briefly present the method and results of this effort, which uses newly available project-level data from aid donors and aid geomapping to capture information on food security activities in Malawi. As one of the poorest and most food insecure nations in the world, Malawi represents an important case study.

This aid tracking pilot provides key insights into whether and how donors are shifting away from emergency food relief toward allocating longer-term development resources to address the underlying conditions contributing to food insecurity. More specifically, our efforts were driven by a simple observation: although mechanisms exist to track international financing for food security at the sector level, there is little knowledge about how development partners are addressing the three key aspects that determine food security: access, availability, and utilization.[3] Moreover, we know little about whether aid projects target short- or long-term relief to alleviate acute (temporary) or chronic food insecurity. Finally, most of the information on the location of donor aid is reported at the national level, making it difficult to track how resources target sub-national variation in food insecurity that results from local differences in topography, rainfall patterns, and market infrastructure. Our methodology, based on the ability to access and mine project documents for precise geographical and activity information, permits a careful assessment of the alignment of foreign food security assistance with a country's food security needs.

In our pilot, we examine seven key development partners in Malawi and pose numerous questions regarding their food assistance, including:

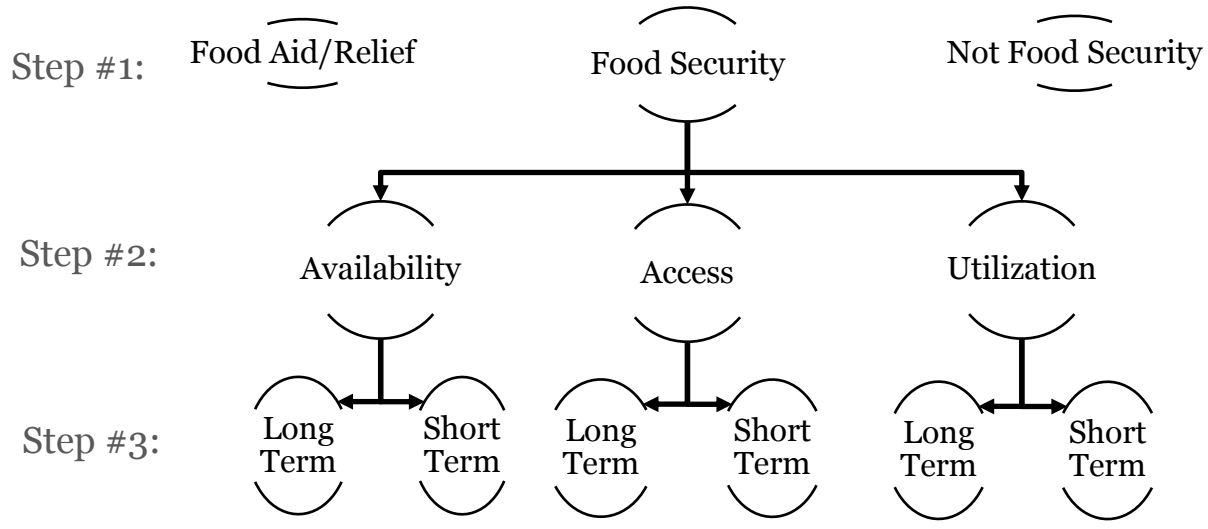
1. How much official development assistance (ODA) in Malawi focuses on food security?
2. What type of food security assistance is most prevalent in development partners' activities? Specifically, how much assistance is focused on enhancing the three critical elements of availability, access, and utilization, and how much is targeting long-term versus short-term relief?
3. Where is food security assistance located, and is it aligned with vulnerabilities within the country?

Overview of the food security coding methodology

Building on the previous work of CCAPS,[4] food security coding relies on activity-level coding. Coding each activity within a project, rather than the project as a whole, allows researchers to capture donor aid allocated toward food security even when it is not the main or only component of a development project. This decreases estimation errors and provides more detailed information than that available at the project level.

The food security coding process is illustrated in Figure 1. Coders first use project documents, such as project appraisal and implementation documents, to identify all activities within a given project. Each activity is assigned one of over 700 possible activity codes, as classified by AidData.[5] Each activity code is then assigned to one of three categories: food aid/relief, food security, or not food security. To manually verify these assignments, coders return to the project documents to understand the individual details and context of the project and change the preset categories as appropriate. If an activity falls into the category of food security, coders further classify the activity into one of three aspects of food security—access, availability, or utilization—and as intending to provide short-term or long-term relief. Figure 2 provides a detailed definition of each of these categories. Each project is double-coded and arbitrated, with an inter-coder reliability rate of more than 90 percent.

Figure 1. **Food security coding methodology**



Source: Weaver, et al. (2013)

Figure 2. **Food security definitions used in this study**[6]

FOOD SECURITY

"A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active healthy life."

FOOD AID/RELIEF

Provision of food commodities for free or on highly concessional terms to individuals or institutions within one country by foreign donors. This type of aid may or may not be in response to a humanitarian crisis.

AVAILABILITY

Availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports.

ACCESS

Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic, and social arrangements of the community in which he or she live (including traditional rights such as access to common resources).

UTILIZATION

Utilization of food through adequate diet and clean water to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

SHORT-TERM IMPACTS

Impacts that require seasonally, yearly, or otherwise repeated inputs from donors.

LONG-TERM IMPACTS

Impacts intended to last beyond the period of project implementation.

Source: Weaver, et al. (2013)

The Malawi case study

With its high dependence on rain-fed agriculture and susceptibility to both flooding and dry spells, Malawi is particularly vulnerable to food insecurity. International assistance also continues to play a central role in Malawi's economy. ODA as a share of gross national income has ranged from roughly 7 percent in 1973 to a peak of 41 percent in 1994.[7] After hovering around 20 percent since the early 2000s, it rose again to roughly 30 percent in both 2012 and 2013. With Malawi as a case study, we can build on a database of geolocated and climate-coded activities that capture nearly all ODA in Malawi. Led by the CCAPS team, in collaboration with AidData, Development Gateway, and the government of Malawi, Malawi became the first country in the world to map nearly all ODA at the sub-national level in a publicly available, dynamic map.[8] Adding food security coding allows for detailed, sub-national analysis on both climate vulnerability and food insecurity.

We piloted the CCAPS/IPD Food Security Coding Methodology with seven donor agencies, selected for this pilot because of their size and espoused commitment to addressing food insecurity in Malawi. They are the African Development Bank (AfDB), the United Kingdom's Department of International Development (DfID), the European Union (EU), Irish Aid, the Norwegian Agency for Development Cooperation (Norad), the U.S. Agency for International Development (USAID), and the World Bank (see Figure 3). These seven development partners account for roughly 70 percent of the total reported aid to Malawi in 2010.[9] The sample comprises 460 projects with 2,115 activities and 1,089 project locations between 1996 and 2014. Our choice of donors, sample years, and number of projects was somewhat limited by the availability of accessible project documents. As a result, these findings represent an incomplete sample but do demonstrate what research is possible with the use of open data.

Figure 3. **Donor sample**

Donor	Sample Years	Number of Projects	Number of Activities
AfDB	2000-2014	29	249
DfID	1996-2014	109	432
European Union	1996-2010	46	227
Ireland	1996-2010	23	65
Norway	1996-2010	70	372
USAID	1996-2010	134	517
World Bank	2001-2014	49	253

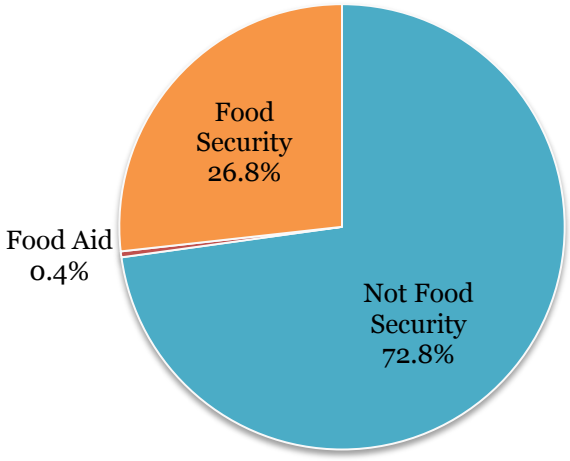
Source: Innovations for Peace and Development; Development Gateway (2015)

How much of ODA in Malawi addresses food security?

In our analysis, we find that 27 percent of the 2,115 activities within the sample address food security in some capacity (see Figure 4). Comparatively, the Ending Rural Hunger project estimates that approximately 6 percent of ODA is spent on food and nutrition security globally.[10] While a direct comparison is difficult, this suggests that aid for food security in Malawi might

represent a much higher proportion of development assistance than in other countries and a substantial proportion of these development partners' aid portfolios.

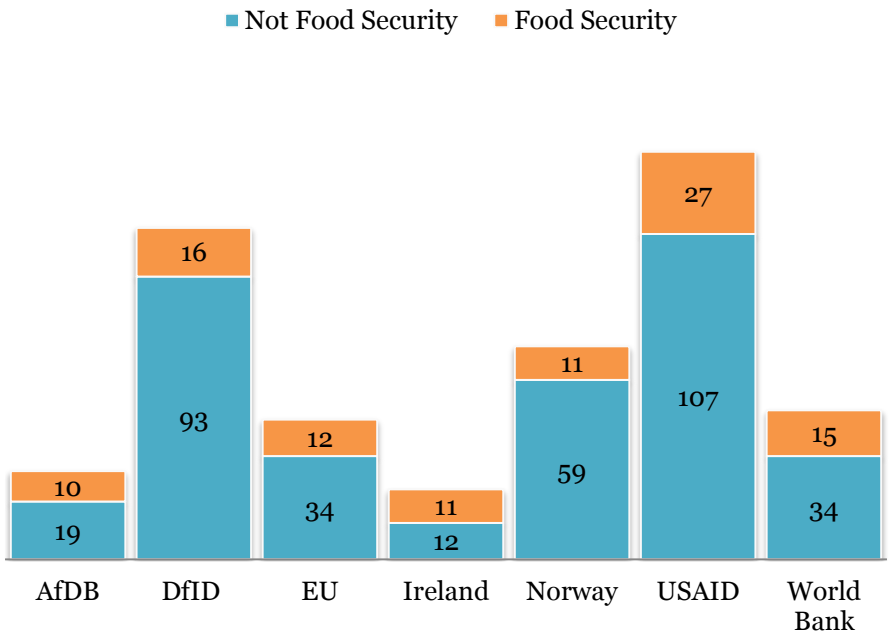
Figure 4. **Distribution of 2,115 activities**



Source: Innovations for Peace and Development; Development Gateway (2015)

Another way to examine the data is at the project level. We classify projects as food security relevant when at least 50 percent of their activities are related to food security. This approximation does not account for financial distribution or the overall size of each activity (as financial details are not yet available at the activity level). Of the 460 projects in the sample, we code 22 percent as food security relevant. Among the seven development partners, USAID has the highest number of food security relevant projects at 27 projects (see Figure 5), while Ireland (with a smaller overall portfolio) has the highest proportion at 48 percent (the range for all development partners is from 15 to 48 percent). These findings correspond to a strong focus on food security by development partners in Malawi.

Figure 5. **Projects with over 50% food security activities**

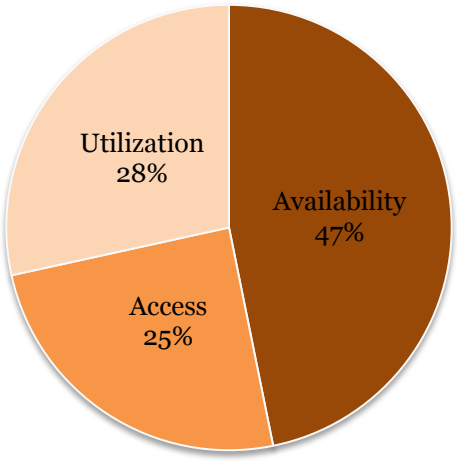


Source: Innovations for Peace and Development; Development Gateway (2015)

What type of food security assistance is most prevalent in donor activities?

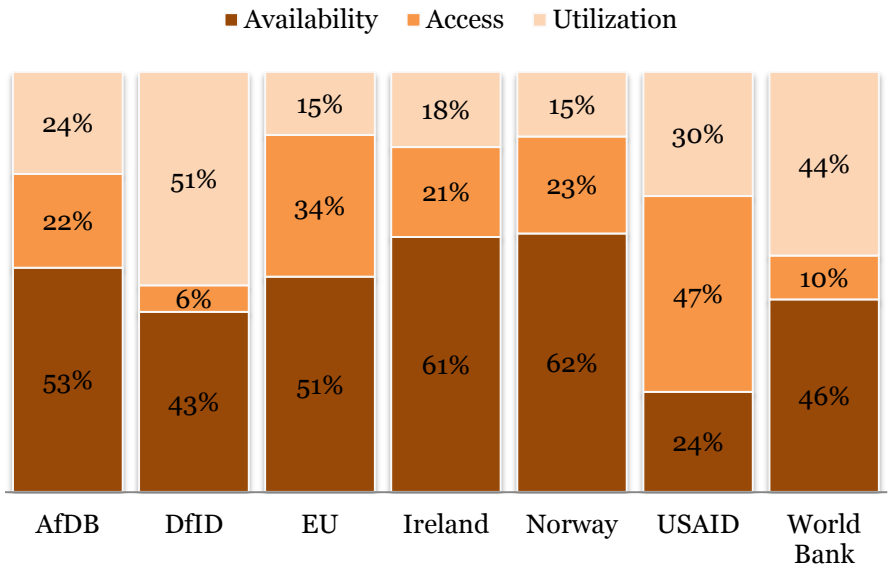
One of the greatest advantages of this work is the ability to distinguish which project activities address availability, access, and utilization (see definitions of each in Figures 2 and 6). As expected, donors devote the largest proportion of activities (47 percent of food security activities) toward increasing the availability of food. Yet substantial resources are also devoted to access and utilization (Figures 6 and 7). This suggests that development partners do not focus resources exclusively on food production rates in Malawi and are attuned to issues of building secure storage, infrastructures for markets, and overall nutritional diversity.

Figure 6. **Percent of 566 activities addressing three dimensions of food security**



Source: Innovations for Peace and Development; Development Gateway (2015)

Figure 7. **Distribution of food security activities by donor** (% of food security activities)



Note: Percentages do not total to 100 due to rounding
Source: Innovations for Peace and Development; Development Gateway (2015)

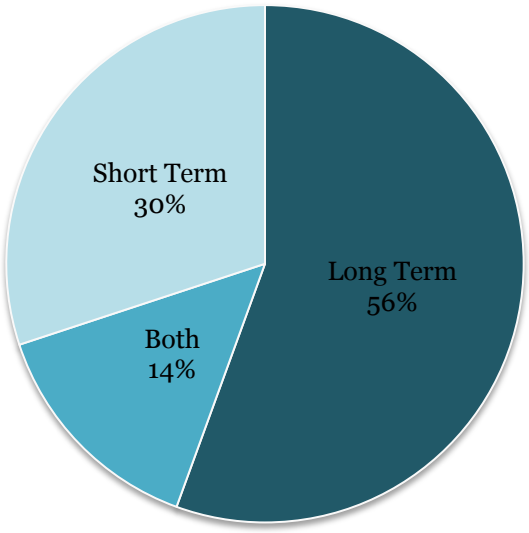
Analyzing individual development partners highlights an interesting range of distributions among the three dimensions of food security. While AfDB, the EU, Irish Aid, and Norad predominantly address availability, USAID focuses more on access and DfID on utilization. The World Bank is evenly divided between availability and utilization. Of the seven donors, USAID is

the only one with a significant share of activities, close to 50 percent, that focus on increasing access. If made widely available via in-country sector working groups, this level of detail could allow for better coordination among development partners and alignment with local priorities. It also highlights areas where additional attention may be needed.

Does aid address acute or chronic food insecurity?

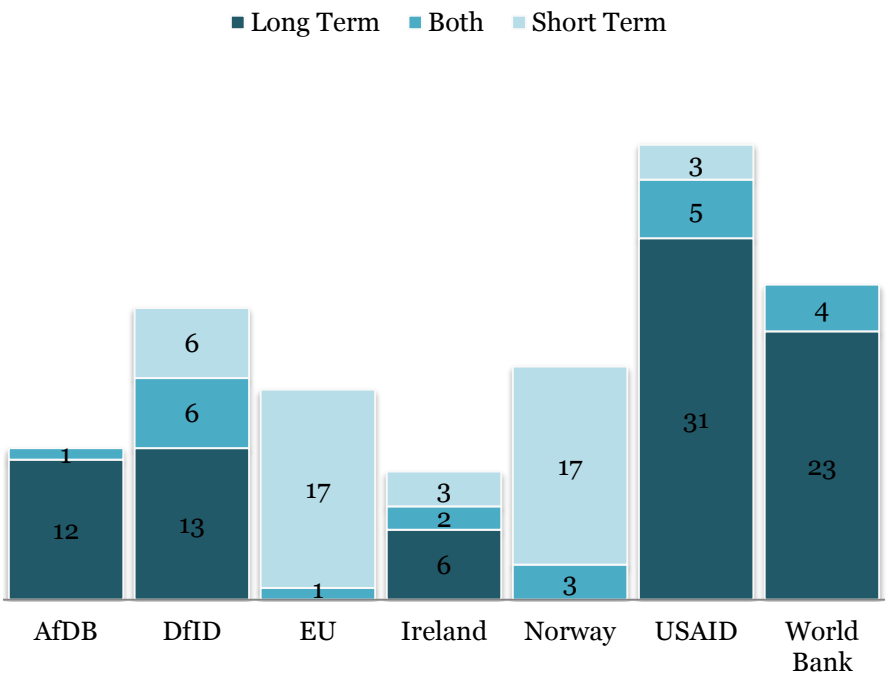
This pilot study also highlights the distinction between projects that provide short- and long-term relief. This distinction is important in Malawi, where there has been much debate over the merits of repeated, short-term agricultural subsidies. The majority of food security relevant projects in this sample (70 percent) are predicted to have long-term effects that last beyond the period of implementation and do not require additional inputs, whereas only 30 percent of projects focus solely on short-term benefits, such as the immediate alleviation of hunger (see Figure 8). Again, we see significant differences between the development partners. The EU and Norad have no projects that focus solely on long-term relief, while AfDB and the World Bank focus almost exclusively on the long-term (see Figure 9). This information may be valuable to the national and local governments in Malawi, which seek to better align external food aid with their particular food security needs.

Figure 8. **Percent of 153 food security projects with short- and long-term intended effects**



Source: Innovations for Peace and Development; Development Gateway (2015)

Figure 9. **Food security projects with short- and long-term intended effects**



Source: Innovations for Peace and Development; Development Gateway (2015)

Where is food security assistance located and does it align with vulnerabilities?

One final benefit of this methodology is the ability to capture aid activity locations and visually integrate that data with information on food security vulnerability. In the two maps below (Figures 10 and 11), which use data from the Malawi Vulnerability Assessment Committee,[11] we roughly see where food aid programs align with food insecurity across the country, with darker shades of red indicating a higher level of food insecurity. We can also see where particular donors have invested their resources (see Figure 11). Because these maps do not include financial information or an indication of the size or characteristics of each project location, we cannot definitively conclude whether development partners are allocating adequate resources to vulnerable areas. However, these maps do highlight vulnerable districts in the south and southeast that have limited or no project locations. Furthermore, displaying aid project locations by development partner can help to promote collaboration and efficiency in resource allocation among donors, NGOs, and the government of Malawi.

Figure 10. **Food security projects and vulnerability in Nalawi**

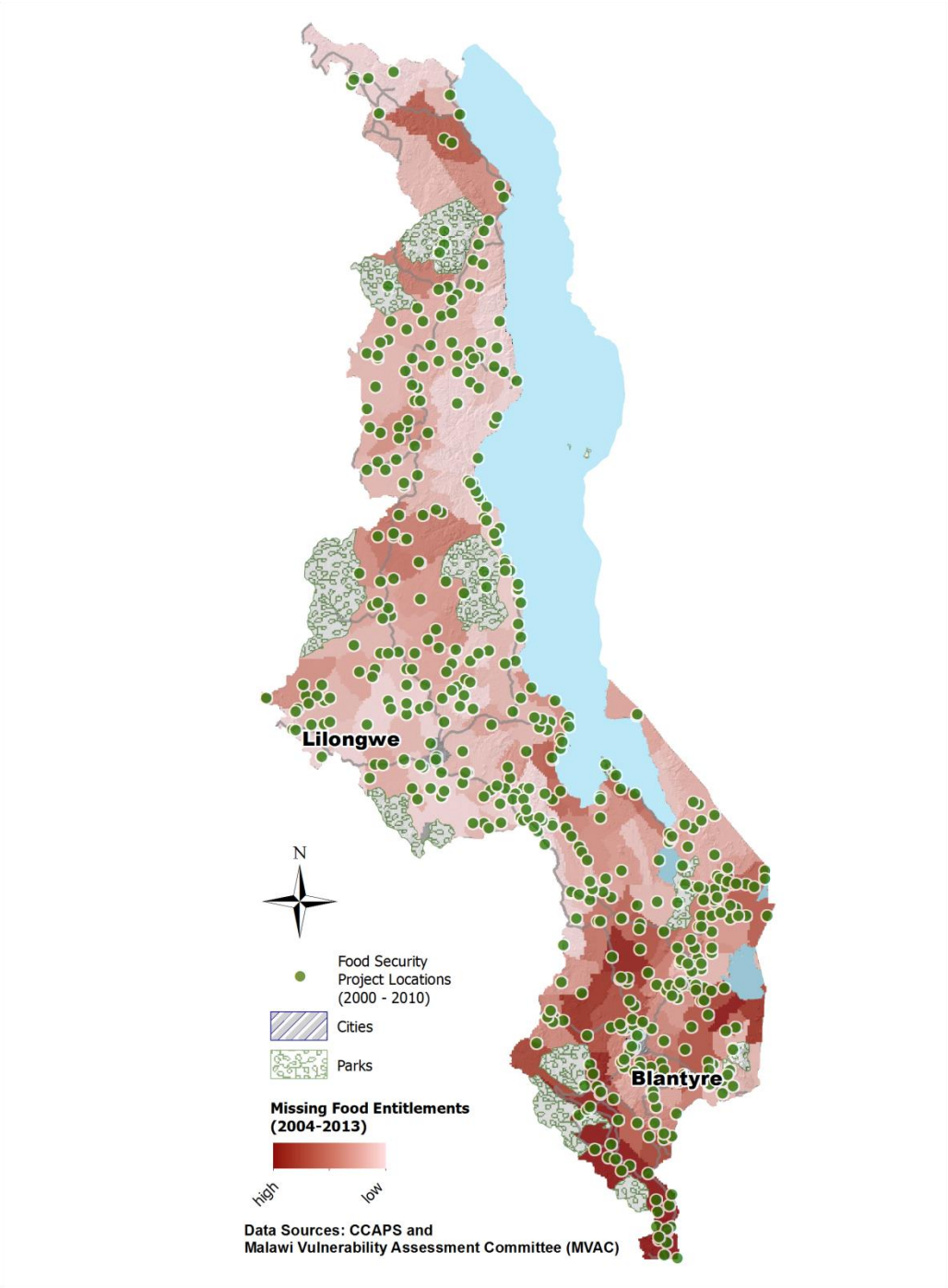
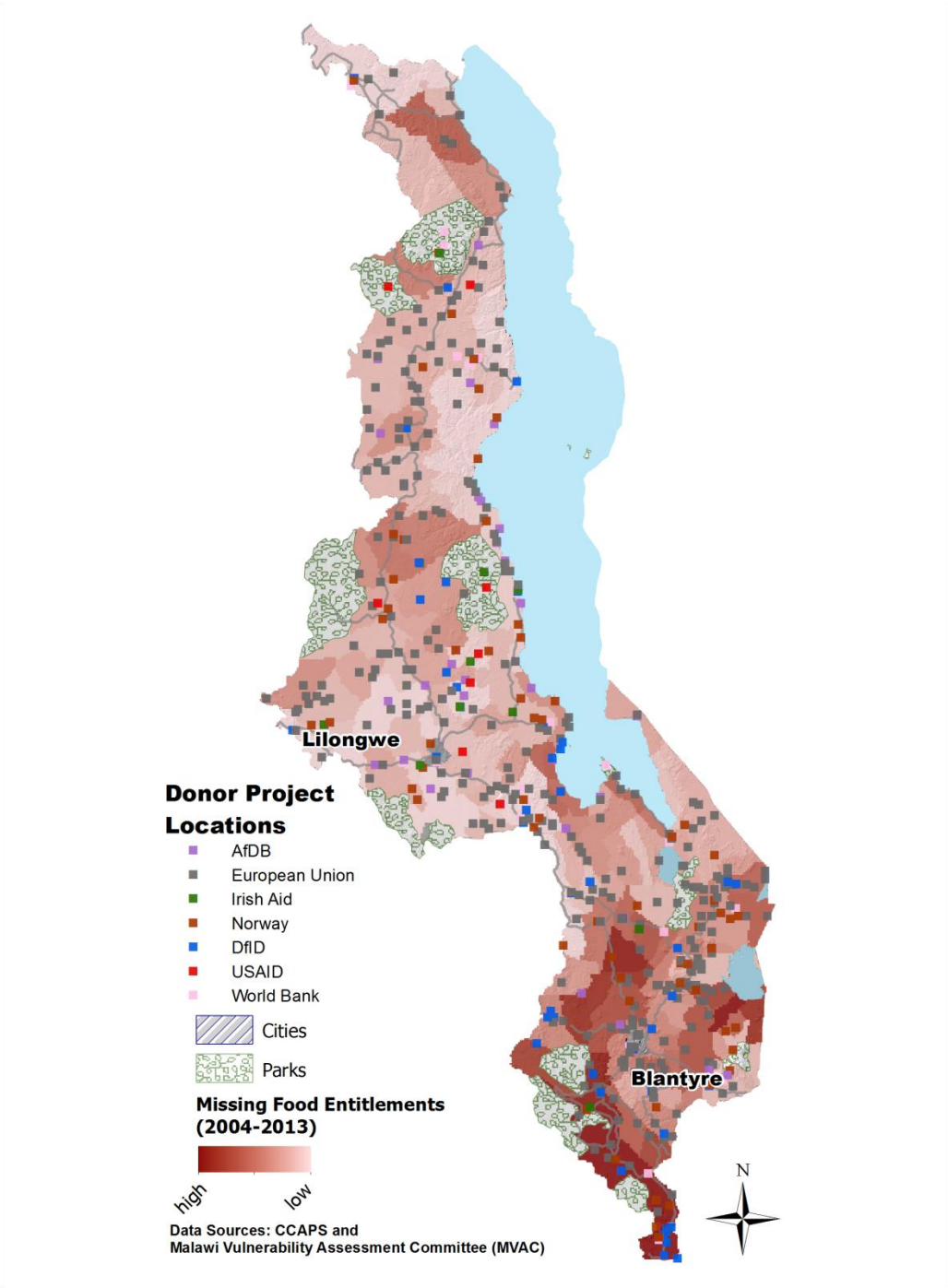


Figure 11. **Project locations by donor in Malawi**



In a dynamic dashboard using this dataset, users could interact with the data and pull up information on activities, seeing what kinds of activities each development partner supports at each location. A more advanced user of the dashboard could also import new data (as GIS base layers), such as rainfall patterns, crop yields, and population density, to conduct more rigorous analysis and answer more pointed questions about aid allocation and effectiveness. At the country level, development partners may use this information to assess whether they are targeting their aid in an optimal manner and to coordinate with other donors to reduce redundancies and inefficiencies in areas where aid is tightly clustered. In turn, partner governments can more easily see where donor aid is aligned (or not) with their national food security priorities and manage domestic resources to leverage external assistance.

Conclusion

The CCAPS/IPD methodology of tracking and mapping food security assistance is a promising tool for capturing information on the amounts, types, and locations of food security projects. While limited in scope, this pilot study shows variation, sometimes substantial, in the type and characteristics of food security projects funded by donors in Malawi. This information can contribute to increasing coordination among development partners and between development partners and government, and it can improve transparency and accountability. While the possibilities for scaling up this work remain limited due to the lack of detailed, accessible project information for all donors, the proof of concept is powerful.

Most importantly, the combination of detailed activity and geocoding of aid projects enables us to both visualize and more deeply analyze development financing that targets food insecurity in countries where hunger threatens sustainable and equitable socioeconomic development. This is at the heart of the SDGs. Most critically this work demonstrates that, while challenging, it is indeed possible to use new technology, such as GIS, to realize the UN goals of a data revolution and to deploy the SDGs in a rigorous way to ensure that we are able to track our progress toward ending world hunger.

Note: This material is based on work supported by, or in part by, the U.S. Army Research Laboratory and the U.S. Army Research Office under contract/grant number W911NF-09-1-0077.

[1] Catherine Weaver, Stephen Davenport, Justin Baker, Michael Findley, Christian Peratsakis, and Josh Powell, *Malawi's Open Aid Map* (Washington DC: World Bank, 2014).
[2] Catherine Weaver, Abigail Ofstedahl, Elena Rodriguez, and Justin Baker, "Tracking Aid for Food Security: Methodology and Pilot Case Study in Malawi," CCAPS and IPD Research Brief No. 17 (Austin: Robert S. Strauss Center for International Security and Law, 2013).
[3] Alexander Gaus, "Food Security: A Mapping of European Approaches," GPPi Research Paper No. 15 (Berlin: Global Public Policy Institute, 2012); UN Food and Agricultural Organization (FAO), International Fund for Agricultural Development (IFAD), and World Food Program (WFP), *The State of Food Insecurity in the World 2014: Strengthening the enabling environment to improve food security and nutrition* (Rome: FAO, 2014), available at http://www.fao.org/publications/sofi/2014/en/.

[4] Catherine Weaver, Justin Baker, and Christian Peratsakis, "Tracking Climate Adaptation Aid: Methodology," CCAPS Research Brief No. 5 (Austin: Robert S. Strauss Center for International Security and Law, 2012).
[5] Daniel Strandow, Michael Findley, Daniel Nielson, and Joshua Powell, "The UCDP-AidData Codebook on Geo-referencing Foreign Aid, Version 1.1," Uppsala Conflict Data Program, 2011.

[6] FAO, IFAD, and WFP. 2013. *The State of Food Insecurity in the World 2013. The Multiple Dimensions of Food Security* (Rome: FAO, 2013), available at http://www.fao.org/docrep/018/i3434e/i3434e00.htm.
[7] World Bank, *World Development Indicators*, 2015 http://data.worldbank.org/indicator.
[8] Weaver, et al. "Malawi's Open Aid Map."
[9] Aiddata.org.
[10] Homi Kharas, John W. McArthur, Geoffrey Gertz, Sinead Mowlds, and Lorenz Noe, "Ending Rural Hunger: Mapping Needs and Actions for Food and Nutrition Security," Global Economy and Development (Washington, DC: Brookings Institution, 2015).
[11] The base layer of these maps represents a composite index of food insecurity produced using data gathered annually by the Malawi Vulnerability Assessment Committee (MVAC) from 2000 to 2010. For more information on MVAC outputs, see:
http://reliefweb.int/report/malawi/malawi-vulnerability-assessment-committee-mvac-national-food-security-forecast-april-1