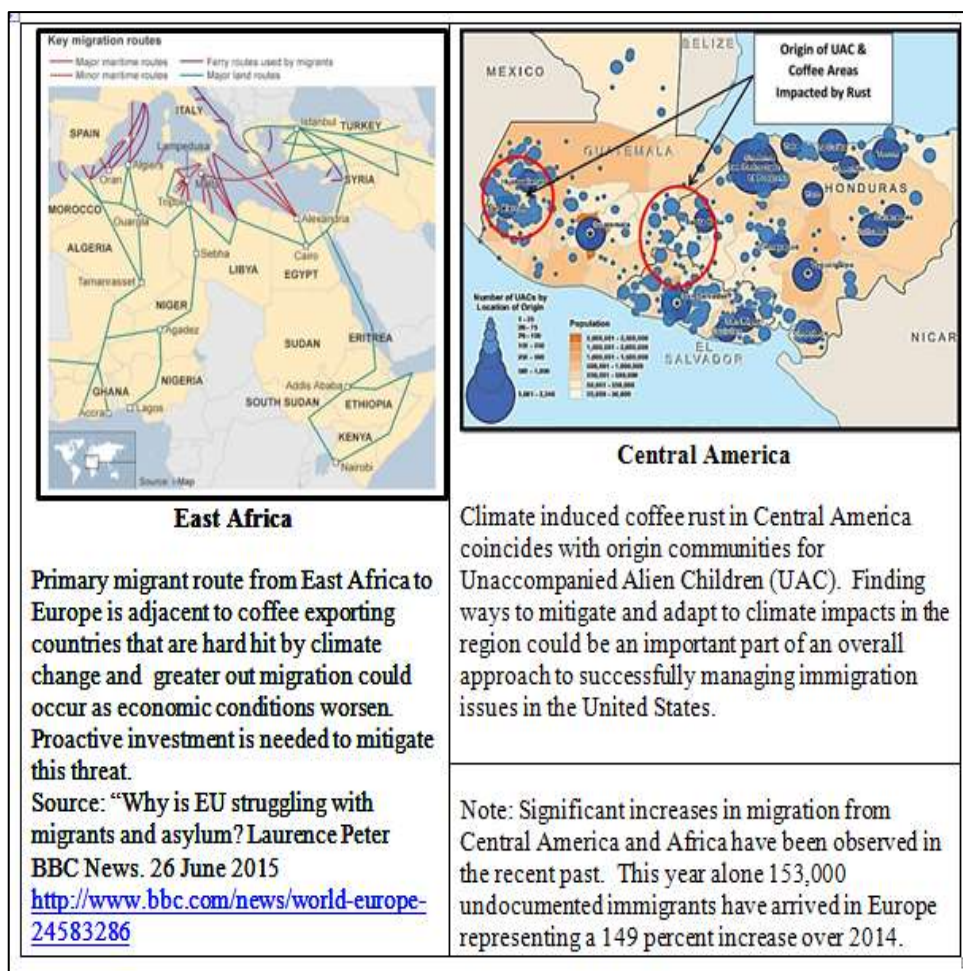


## Climate and Coffee Initiative

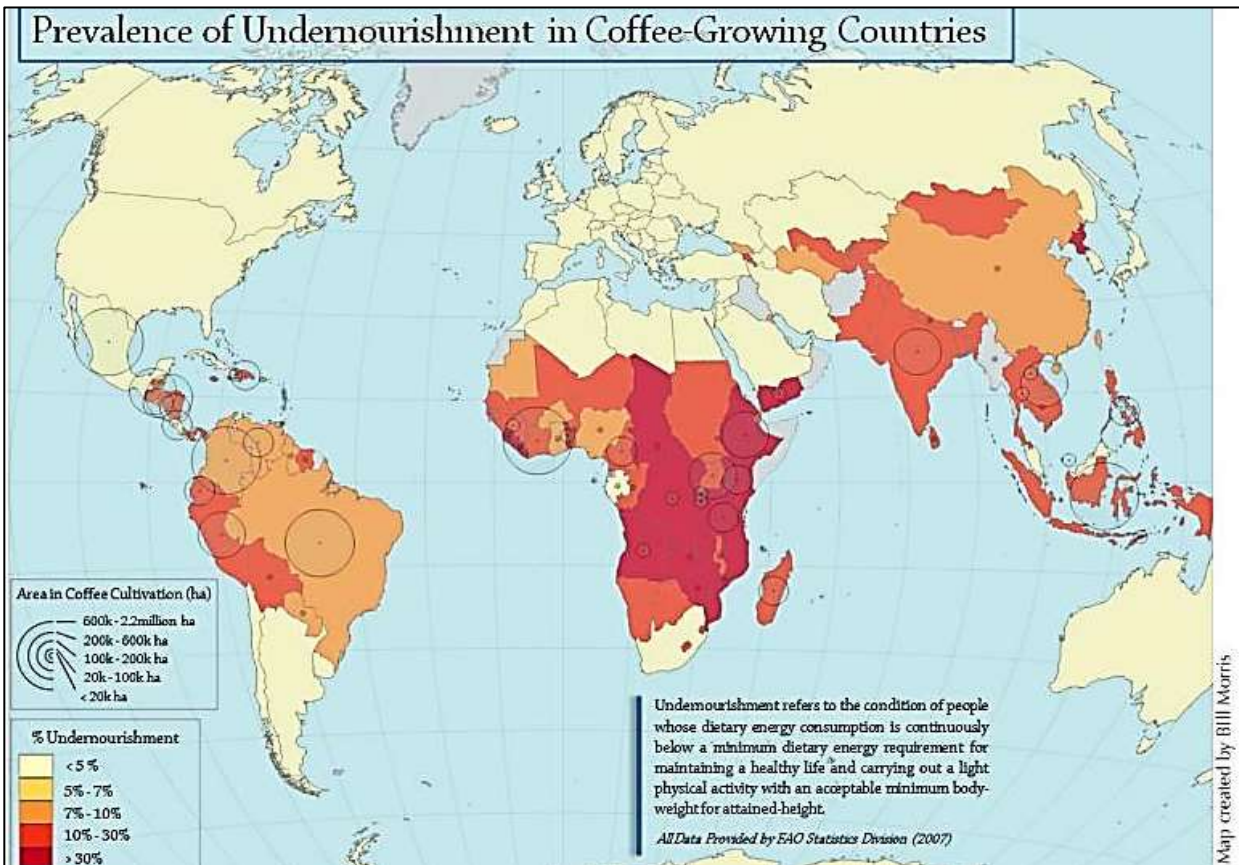
Climate change is threatening a global coffee market valued at over \$170 billion.<sup>i</sup> Millions of jobs are at risk for smallholder farmers, seasonal workers, and others involved in the coffee value chain. Impacts from these changes will be transnational, affecting stakeholders in both developed and developing economies, and will require a more holistic, comprehensive, and proactive effort. The current donor response, focused on targets of opportunity, is reactive and limited in scope. The time is right for a global effort that brings a wide range of stakeholders together, creates synergy, and provides an overarching framework for action to (1) assess and identify coffee areas at risk of significant negative impacts, (2) inform policy makers and stakeholders of the scope and seriousness of the situation, and (3) design and implement effective mitigation and adaptation programs.

Finding ways to promote resilience is critical as indicated by a study at the University of Vermont which found that many smallholder coffee farmers suffer one or more months of food insecurity annually. These households are the least prepared to deal with climate and economic shocks.<sup>ii</sup> As weather patterns change and temperatures increase, vulnerable communities with limited coping ability may experience significant social and economic disruptions, which in turn may increase the potential for instability and conflict.<sup>iii</sup>



The applied research and development activities proposed in this concept paper will demonstrate how to create market-driven sustainable information and support systems that can strengthen existing coffee farmer networks, increase productivity, and generate more income for smallholder farmers. The goal is to promote locally-owned and -led processes for designing, supporting, and implementing national programs aimed at mitigating climate impact in Arabica and Robusta coffee production areas. In doing so, these efforts will strengthen the ability of coffee farmers to respond to weather variability, decreasing yields, and reduced quality.

As climate change negatively impacts coffee production, local research and feedback systems will be needed to guide development initiatives that can prevent significant social and economic disruptions.<sup>iv</sup> Community led development requires buy-in and local ownership that can only come from having an indigenous leadership informed with real time weather, production and market information. Support to these groups will be needed to help them design and implement local development activities that help smallholder farmers adapt their coffee production to the changing conditions (e.g., increased minimum temperatures, erratic weather events, etc.) or to mitigate these impacts by diversifying agriculture production or engaging in other economic activities (e.g., coffee tourism, nostalgia agriculture for diaspora population, etc.).



Map from Food Security and Smallholder Coffee Production: Current Issues and Future Directions

See <http://www.uvm.edu/~agroecol/?Page=Publications.html>

Recent research identified coffee areas in three regions as particularly susceptible to climate impact: Central America, East Africa and Vietnam. A pilot program in each area is described in a separate document: “Pilot Program Briefs.” Under each of the pilot programs, actions would be taken to: (1) Map and Analyze; (2) Assess Potential Impact; (3) Facilitate Multi-stakeholder Processes; (4) Promote Mitigation and Adaptation Programs; (5) Mobilize Resources; and (6) Monitor and Evaluate.

Map and Analyze - Significant changes in coffee production are already occurring and the first step in understanding the scope and magnitude of this phenomenon is to work with national coffee federations and farmer organizations to geographically identify problem areas, map the climatic conditions – past and present – and design a system to map future impacts. Key coffee production areas will be disaggregated by elevation and existing climate conditions. This data will be used to create maps of areas that are most “at risk” of increasing minimum temperatures and erratic weather. Existing impact and projections based on appropriate climate models will be developed to understand historical trends and provide estimates of coffee yield reduction over the near to medium term. A “descriptive analysis” technology system, based on NIRS (Near Infra-Red Spectroscopy) analysis, will be established to assess cup quality (taste characteristics of coffee) and in-country personnel trained in its use.

Assess Potential Impact - Assessing climate and coffee impact will take into account humanitarian, economic and social risks. A development “triage” approach – where the weakest, most vulnerable areas are identified and focused on first – will seek to prevent areas from spiraling into disaster situations. A key aspect of this approach will be a focus on market systems to determine what actions are needed to increase incomes, promote food availability, and reduce risk. Each area will have different types of problems and will need programs that are compatible with household coping systems, adapted to local markets, and sustainable over the long term. An example of the development triage approach would be to assess coffee exporting countries on three criteria: (1) dependence on coffee exports as part of overall economy; (2) existing food insecurity and poverty in specific regions within a country or region (Global Food Security Index); and (3) potential secondary impacts that affect key foreign policy objectives of major donors (e.g., out migration, increased instability, civil conflict, etc.)

Facilitate Multi-stakeholder Processes –A process will be put in place to identify key stakeholders, establish mechanisms for interaction and collaboration (in a way that facilitates locally led development), and support community-public-private partnerships that leverage resources and ensure sustainability. For those communities in which coffee production will no longer be economically feasible due to decreasing yields and reduced quality, diversification strategies will be designed and implemented as part of national climate mitigation programs. While the focus is clearly on coffee communities, the impact can be more widespread as adaptation plans are developed through an ongoing dialogue to stabilize at risk communities, create opportunity areas, and facilitate change needed for sustainable development. A study of social capital systems will be conducted and used to inform local and national organizations how to marshal efforts aimed at mitigating climate impact on coffee areas.<sup>v</sup>

Promote Mitigation and Adaptation Programs – Based on potential impacts and the strategic importance to the donor community, the program will prioritize actions needed to mitigate the climate issues in coffee areas. Investment promotion and stakeholder engagement strategies will be developed to help leverage support from both public and private entities. These strategies will include a focus on resilience and economic sustainability that enhance public-private partnerships, crowd funding with US and European consumers, and climate related development priorities of bilateral, multilateral and regional international development entities. Support will be designed to stabilize “at risk” communities, create opportunity in areas with potential for growth, and facilitate change needed for sustainable development.

Resource Mobilization - Sustainability will be a key aspect of program design and implementation involving local coffee community groups. Support will be provided to these groups to create synergy and build alliances to promote coffee adaptation and mitigation strategies. Evidence based research for engaging policy-makers and the private sector will be conducted and used to develop comprehensive plans to identify the problems, guide a process for resolving them, and support partnerships to ensure sustainable Arabica and Robusta coffee production. Where coffee is no longer suitable for production, the focus will be on diversifying into other agricultural crops or into non-agriculture economic activities. Creating access to finance that is linked to high value markets will be a critical aspect of promoting sustainability.

Monitor and Evaluate – An M&E system will be established to assess impact and achievement of program objectives (improved productivity, increased access to high value markets, and higher rural family incomes) in a sustainable manner. The program will provide a “lessons learned” portal that will utilize low cost, publicly available mapping data to highlight impact of climate on coffee, describe the locally led initiatives that are being designed and implemented, and provide a platform for exchange of information, partnering and support. Support will be provided to help community groups partner with interested parties to obtain mutually beneficial objectives (e.g., a continued supply of high quality coffee). This approach will target a “community apart” – the diaspora of a particular coffee area – to be involved in local development efforts.

In summary, VEGA will work with its partners and aWhere to assess climate issues, quantify impact of the anticipated climate change, and implement a locally led strategy to address these issues. A key aspect of this approach will be a focus on market systems for resilience that seeks to understand and address actions needed to increase incomes, increase food availability, and reduce risk.<sup>vi</sup> These systems will create synergy and build alliances to promote coffee adaptation and mitigation strategies. Evidence based information for engaging policy-makers and the private sector will be developed as will a comprehensive approach to help coffee communities address climate issues. These efforts will support partnerships to ensure sustainable Arabica and Robusta coffee production, and where coffee is no longer suitable for production, it will work to create strategies for diversifying into other agricultural crops or into non-agriculture economic activities.

### **Volunteers for Economic Growth Alliance (VEGA)**

VEGA partners bring over 50 years’ experience in addressing a range of smallholder farmer needs through a comprehensive and globally coordinated approach. Its members are leaders in designing and implementing program to increase smallholder farmer productivity, improve access to markets and finance, and increase rural family incomes and food security. VEGA takes a systems approach to analyzing and addressing climate issues impacting the global coffee sector that identify climate and economic shocks, define potential secondary and tertiary impacts, and recommend effective adaptation and mitigation activities. The VEGA alliance brings a “mosaic approach” involving different implementers and strategies tailored to country and region specific needs. Their combination of expertise in research, market access, and coffee production is scalable and replicated in coffee areas around the world. In short, the VEGA advantage is the coordinated approach and design and implementation capabilities it is able to bring to bear on specific issues associated with climate impact on coffee producing countries.

## **aWhere**

aWhere can create the mapping, agronomic, and meteorological foundation for a targeted and coordinated development approach. Using field-specific weather data for coffee areas plus customized agronomic models, it can (1) create maps of production zones most "at risk" to increasing minimum temperatures and erratic weather, (2) develop regionally-specific agronomic models for projecting field-level growth and harvest milestones, (3) implement a descriptive analysis" system through empirical modeling and Near Infra-Red Spectroscopy (NIRS) analysis to map areas that are at risk of losing cup quality, and (4) establish real time communication networks using ICTs (smart phones, tablets etc.) to provide coffee farmers with actionable agronomic weather information. aWhere also promotes entrepreneurial development (e.g., Hack-a-thons, social media events, etc.) to encourage the creation of innovative farmer and agricultural value-added information services. These services can be scaled and sustained as "fee based" enterprises providing climatic information important to coffee production, processing and marketing stakeholders.

## END NOTES

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<sup>i</sup> World coffee trade (1963 – 2013): A review of the markets, challenges and opportunities facing the sector. International Coffee Council, 112th Session 3 – 7 March 2014 London, United Kingdom Note: Coffee value calculated based on 142 million 60kg bags per year converted to roasted coffee by dividing by 1.19 with average cost per cup estimated at \$2 in traditional markets and \$1.50 per cup in exporting and emerging markets. <http://www.ico.org/news/icc-111-5-r1e-world-coffee-outlook.pdf>

<sup>ii</sup> Caswell, M., Mendez, V. E., Bacon, C.M., Food Insecurity and Smallholder Coffee Production: Current Issues and Future Directions. Website: [http://www.uvm.edu/~agroecol/CaswellEtAl\\_FoodSecurityCoffeeARLG%20pb1\\_12.pdf](http://www.uvm.edu/~agroecol/CaswellEtAl_FoodSecurityCoffeeARLG%20pb1_12.pdf) June 19, 2015.

<sup>iii</sup> Bunn, C., Läderach, P., Rivera, O.O., Kirschke, D. Climatic Change- DOI 10.1007/s10584-014-1306-x A Bitter Cup: Climate Change Profile of Global Production of Arabica and Robusta Coffee. See <http://link.springer.com/article/10.1007%2Fs10584-014-1306-x#>

<sup>iv</sup> Jha, S., C.M. Bacon, S.M. Philpott, R.A. Bunn, C., Läderach, P., Rivera, O.O., Kirschke, D. Climatic Change- DOI 10.1007/s10584-014-1306-x A Bitter Cup: Climate Change Profile of Global Production of Arabica and Robusta Coffee. See <http://link.springer.com/article/10.1007%2Fs10584-014-1306-x#>

<sup>v</sup> Some coffee areas are more vulnerable to climate impacts. Finding was to assess climate and coffee impact should take into account the overall situation that a country faces and quantify the impact of the anticipated climate change as part of that overall situation. This development "triage" approach – where the weakest, most vulnerable countries are identified and focused on first – will prevent borderline countries from spiraling into disaster situations. A key aspect of this approach should be a focus on market systems for resilience that seeks to understand and address actions needed to increase incomes, increase food availability, and reduce risk. Each coffee exporting country facing climate related impacts will have different types of problems and will need programs that are compatible with household coping systems, adapted to local markets, and sustainable over the long term.

<sup>vi</sup> "Leveraging Market Systems for Resilience" LEO Report No. 6 – January 2015. Bronwyn Irwin and Ruth Campbell of ACDI/VOCA with funding from USAID/E3's Leveraging Economic Opportunity (LEO) project. See <http://acdivoca.org/sites/default/files/attach/2015/02/LEO-Market-Systems-for-Resilience.pdf>