

## **A Small University Helps Small Farms, Addresses Big Problems**

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### **Abstract**

Farmers Access to Regional Markets (FARMS) is an agricultural supply chain model developed by the Rural Development Center (RDC) at the University of Maryland Eastern Shore (UMES). It addresses universal problems facing small farmers around the world, particularly those associated with business risk, and it leverages market forces to not only address these problems but also create a sustainable economic engine that encourages investment and drives growth. The model is termed a “network.” It is predicated on four components: appropriate greenhouse technology, an agribusiness with expertise in growing, a strong market, and market demand. By developing partnerships with the public and private sectors to identify and connect these components, the RDC has demonstrated the model’s capacity to provide small produce farmers with access to regional markets, reduce their risk, and increase their profitability.

### **Introduction**

**R**ural poverty accounts for 70 percent of the world’s poor (World Bank 2007). This group is composed primarily of families with small farms who, regardless of the country, face systemic obstacles. One significant obstacle is buyers’ greater access to markets and market information, which enables them to set prices. The low prices farmers receive create low incentives and few resources to invest in intensive production methods that could lead to greater income. This system of low prices effectively blocks investment in production agriculture, contributes to stagnation of the agriculture industry and rural economy, and is the basis for the migration of the rural poor to urban poverty and crime centers in the developing world.

Agriculture is also a high-risk business. It is dependent on factors such as weather and is impacted by pests, which can reduce yields and destroy crops. In addition to these variables, agriculture faces the common business risk of market fluctuation, which can drop market prices below production costs. In our global marketplace, the risk is even greater, as local commodity producers compete against commodity producers all over the world. Larger farms are able to generate more profit and better withstand market

downturns. Small farmers cannot compete long-term in the commodity market.

Farmers Access to Regional Markets (FARMS<sup>®</sup>) is an agricultural supply chain model developed by the Rural Development Center (RDC) at the University of Maryland Eastern Shore (UMES). It addresses universal problems facing small farmers around the world and leverages market forces to not only address these problems but also create a sustainable economic engine that encourages investment and drives growth. The model is termed a “network” and is predicated on having four components in place: appropriate greenhouse technology, an agribusiness with expertise in growing, a strong market, and market demand. For well over a decade, the RDC at UMES has been developing partnerships with the public and private sectors to identify and connect these components. As a result, FARMS has provided small farmers with access to regional markets, reduced their risk, and increased their profitability.

## **Background**

In 1989, the University of Maryland Eastern Shore created the Rural Development Center to develop new and innovative ways to facilitate the growth of the economy in its region. UMES is a small,

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historically black land-grant university on the Delmarva Peninsula in one of Maryland’s poorest counties. This predominantly rural area was once the home of flourishing truck farming operations and fisheries-based occupations, both of which have become progressively more endangered by market forces, the pressures of suburban development on land use, and declining water quality. The RDC’s mission is to strengthen and diversify the rural economy of Maryland’s nine

counties on its Eastern Shore. It collaborates with local higher education institutions, governments, and the private sector to accomplish this mission. Emphasis is on public/private partnerships and regional approaches through which communities and businesses jointly prosper. Applied social and economic science dominates the research and technical assistance work of the center.

The RDC is supported by a variety of funding sources, including federal and state agencies, private foundations, and Maryland

Cooperative Extension (MCE), which is the outreach arm of the university. MCE, in turn, is supported by county contributions as well as funds from federal and state sources (*Rural Development Center 2007*).

Within this collaborative, cooperative environment, the RDC created a new business model called FARMS. This environment includes knowledge and research provided by UMES, access to government resources, and a carefully developed base of mutually beneficial partnerships with the private sector. FARMS was designed to drive economic development in rural communities by enabling small farmers to achieve a middle-class standard of living.

### **The FARMS Model**

The agricultural supply chain model developed by the RDC and dubbed Farmers Access to Regional Markets, or FARMS, is designed to minimize business risk for small farmers. The model is termed a “network.” It is based on appropriate greenhouse technology, an agribusiness with expertise in growing, market demand, and a strong market.

Appropriate technology addresses production risk by creating a controlled environment. Here “appropriate” means that the technology is affordable for small farmers and delivers sufficient profit to justify the necessary investment. “Appropriate” technology also is tailored to local conditions. Use of a controlled environment and fertigation system (the application of nutrients through irrigation systems) ensures crops have integrated pest management systems to prevent quality- and yield-damaging infestation plus ideal growing conditions with no weed competition.

Market risk is addressed by creating a link with a market that enables farmers to sell not a commodity product but a value-added product. The FARMS model targets markets that demand high quality. Typically, to access such a market and deliver guaranteed quality, a business must control both production and marketing. This is often accomplished through vertical integration. In the FARMS model, a key component is an agribusiness involved in both production and marketing. In the FARMS model, such a firm is called a Major Grower Marketer (MGM).

An additional factor in MGM success is market demand for their product that far outpaces their ability to meet it. Such businesses soon face a problem accessing credit. Debt ratios increase the risk assessment made by financial institutions. This results in increasing interest rates and culminates in either lack of access to

credit or a cost of credit so high that further expansion is unprofitable. Typically, these firms have maximized their ability to take on debt in an attempt to expand their production base to keep up with market demand. Because their target market has strict quality demands, they are unwilling to risk their market by sourcing commodity from the open market.

FARMS provides a business model for MGM-farmer interaction that meets the MGM need for a stable supply of high-quality produce while addressing small farmers' needs for stable markets and production technology. The FARMS model does this by utilizing two components listed below.

### **Technical package**

MGMs provide farmers with a technical package. This package starts with a one-page business plan that details all costs associated with producing the crop. Because they are vertically integrated businesses, MGMs use their production knowledge to capture and service demanding markets. As successful businesses, they know all the costs associated with the production of their crops. The FARMS model expands their supply of quality produce through the application of their production technology expertise on the farms of growers who become their suppliers.

Agribusiness in general is apprehensive about sharing production technology because such knowledge is a component of competitive advantage in the market. Approaches used by agribusiness often cannot be patented and must be protected as trade secrets. The FARMS model was designed to allow business to apply this technical knowledge through other growers while protecting trade secrets and intellectual property. This is done in several ways. MGMs can be the sole supplier of key inputs for growers, and knowledge of these components is kept proprietary. Technical knowledge is applied through the MGM's representative. The MGM representative visits each farm on a regular basis to advise network growers on what they need to do to maximize their production. This service is not done to educate producers but to ensure high-quality production. Because MGMs retain their trade secrets through this business model and continue to be involved in production, both profit incentives and production research and development opportunities remain for MGMs to continue to innovate in their production.

### **Fixed-price contract**

Farmers receive a fixed-price contract guaranteeing purchase of a specific quantity and quality of produce at a specific price.

This contract is established before the crop goes in the ground. Farmers are able to use this guaranteed purchase together with the one-page business plan from the technical package as collateral for a loan. This loan is used to finance investment in the production technology necessary to guarantee crop quality. The details of the necessary production technology are provided by the MGM as part of the technical package, and receipt of a fixed-price contract is dependent upon investment in this technology.

### Overcoming MGM reluctance

The RDC recruited MGMs with established access to markets where that access is based on a consistently high-quality product. Of course, such companies know their competitive advantage and trade secrets are vulnerable to duplication, and this vulnerability of their business model makes them reluctant to bring outside businesses into their supply chain. FARMS addresses this challenge by targeting MGMs that have an incentive to engage outside suppliers—that is, MGMs who recognize that their market is larger than the MGM’s existing resources can capture. The model design addresses trade secret issues by allowing MGMs to retain control of key inputs and technical knowledge. The model also provides MGMs with an incentive to try the system because FARMS offers

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access to new facilities and new technology. MGM successes are often based on technical knowledge, so great benefits may accrue from access through the university to new, innovative technology at below-market cost. This is provided with the agreement that they will add network growers.

### Introducing competition to protect growers

The MGM controls trade secrets and access to the market. Each MGM is aware of their growers’ production costs, and MGMs control components of their growers’ production inputs. Growers cannot produce without the MGM’s support. In such an environment, an MGM is able to drive prices rapidly down to the growers’ equilibrium price and capture all the value in the supply chain. This is the nature of business and a common characteristic of, for example, the U.S. poultry industry. MGMs are selected because

**Table 1. UMES incubator greenhouse funding sources**

|   |                    |
|---|--------------------|
| Economic Development Administration                                   | \$1,080,000        |
| MD Department Business Economic Development (CDBG to Somerset County) | 428,000            |
| W.K. Kellogg Foundation   | 1,000,000          |
| Rural Development Administration, USDA                                | 551,000            |
| <b>Total</b>  | <b>\$3,059,000</b> |

they are savvy businesspeople. It is practically a given that when an MGM realizes it has the above-mentioned advantage, the MGM will reduce prices for its growers down to the equilibrium level.

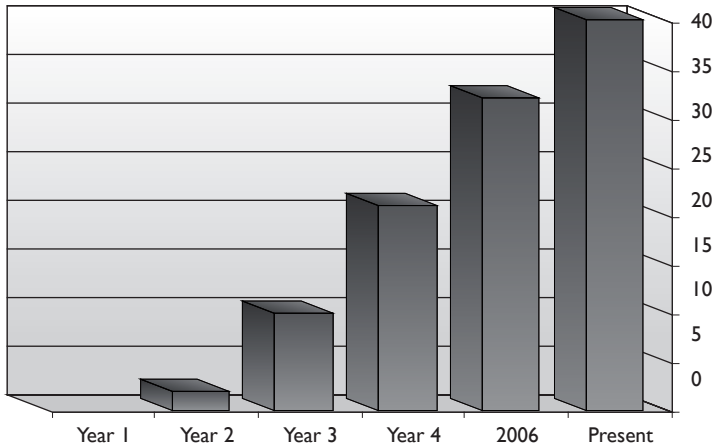
To counter this, competition is introduced into the system. Multiple MGMs are trained in the FARMS network model. Because farmers' ability to produce is not based on special knowledge but rather their ability to follow instructions and be a reliable supplier, they can easily convert their production operation to work for other MGMs. An MGM who pushes prices too low will find his or her growers signing up with other MGMs. This creates financial problems for MGMs, as their ability to capture markets is dependent on a stable, high-quality supply. The introduction of competition provides a market incentive for MGMs to make the business relationship profitable for the farmer and to seek increased profits through new and expanding market share. MGMs will thus seek greater profits through growing a bigger market pie as opposed to capturing a larger percentage of a small market pie. Through competition between MGMs, growers have more variety in the types of commodities they can produce. They also receive assistance from the university in forming service cooperatives to negotiate better prices for bulk purchases of goods and services for all aspects of their businesses, thereby increasing their profits through reduced costs.

## ***FARMS Applied***

### **Maryland**

In Maryland, the FARMS project's first demonstration of concept resulted in the creation of the Greenhouse Growers Network, a network of flower growers for Bell Nursery of Burtonsville, Maryland. To introduce the FARMS model, UMES leveraged funding from multiple sources to construct a 1-hectare (2.5 acre) state-of-the-art greenhouse facility (table 1). This approach, though cumbersome and time-consuming, gave more public sector institutions an opportunity to participate, reducing the risk for any one

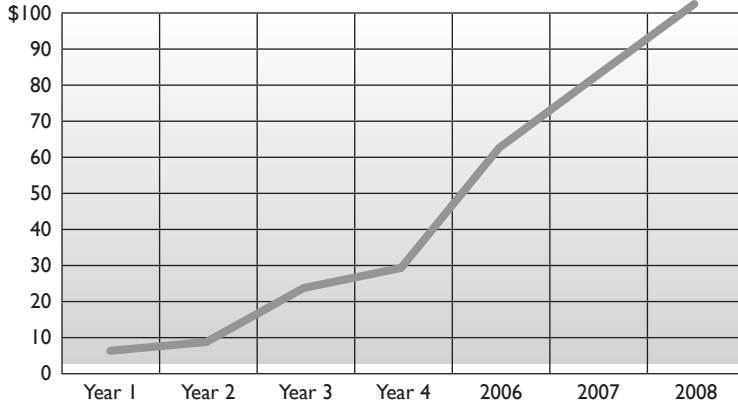
Figure 1. Participating Farms



institution while allowing all participants to share in the credit for the accomplishments of the project.

Access to this facility was provided to Bell Nursery, a local vertically integrated agribusiness. Bell entered into the arrangement because of its needs to meet the growing market demand of its major customer, Home Depot, a large retail outlet providing home improvement and gardening supplies. The corporation represents a substantial market, with stores throughout the region and the United States.

Use of the greenhouse facility was provided at a lower-than-market-rate rental fee with an agreement that Bell Nursery would engage at least two other growers as suppliers to their business. In addition to the financial savings, the arrangement was attractive because the facility provided the MGM access to new production technology. Bell overcame initial reluctance to add farmer/suppliers as the advantages of the grower network system became clear. A prime advantage was that the MGM could maintain quality standards while expanding production without adding company debt. Two growers were added in the second year of the project. UMES worked with the local banking system to involve it in providing the \$250,000 in loans needed to construct these greenhouses. Grower involvement progressed to 10 growers in the following year. By the fourth year of the arrangement between Bell and UMES, the network had 21 growers, who grew \$5.9 million worth of bedding in 13 acres of greenhouses. By 2006 (after the conclusion of the initial arrangement with UMES), the MGM was using 32 farming families as suppliers. There are now over 40 farmers with 1- to 2-acre

**Figure 2. MGM Revenue (in millions)**

greenhouses in the MGM's grower network. Participating growers are earning up to \$80,000 annually before interest and taxes, a solid middle-class income (see figure 1).

The MGM grew from a business with \$4 million in revenue at the beginning of the program in 1999 with UMES to earning \$28 million by 2003. Initially the MGM occupied 5 percent of the shelf space of a handful of Home Depot stores. In 2003, the MGM occupied 75 to 80 percent of the shelf space in 13 Home Depot stores. By 2004 the MGM was the sole supplier to 54 area Home Depot stores. Revenue in 2008 is anticipated to reach \$100 million (see figure 2). All of this was accomplished without the MGM's adding any production capacity of its own.

After the completion of its five-year arrangement with the first MGM, UMES entered into a five-year contract with U.S. Orchid Laboratory and Nursery, the American arm of Jet Green Group of Beijing, China. This was done to introduce a new MGM, drive economic growth, and continue to push demand for small farmer-supplied greenhouse products in the area. As a result of this contract, initial work is being completed on the technical package for orchid production on the Eastern Shore of Maryland inside the hydroponics facility at UMES. The Network Concept model, in combination with U.S. Orchids' twenty years of technological and marketing expertise, positions the UMES site to be the primary provider on the East Coast for these exotic plants. The infrastructure of the FARMS model will enable U.S. Orchids to generate enough production to make the region globally competitive in the orchid industry. As the partnership matures between UMES and U.S. Orchid Laboratory and Nursery, Inc., additional growers will



be needed for that company, too. The potential exists for adoption of the model by other agribusiness enterprises, other commodities, and other locales.

## **Jamaica**

Expanding the application of the FARMS model overseas, the RDC at UMES used the concept to link smallholder Jamaican farmers with lucrative markets in the tourism, fast food, and value-added export industries. The first MGM, Rock Mountain Herbs (RMH), was introduced to the FARMS concept in 2003, after preliminary work to vet Jamaican agribusiness and study the farm-to-market supply chain.

In Jamaica, recognizing the different needs of local agriculture and the value of appropriate technology, the RDC project, in this instance called JA-FARMS<sup>®</sup>, established a demonstration high-tunnel greenhouse specifically designed to be low cost to allow acquisition by a large portion of Jamaica's small farmers and, given Jamaica's geographic location, hurricane resistant. It is important for sustainability that the construction knowledge be available commercially on the local market. A local farmers' cooperative, Santoy Farmers Cooperative, was given equipment and trained in the production of these high-tunnel houses by an engineering expert, UMES faculty, and a network grower from the FARMS' network established by UMES on Maryland's Eastern Shore.

The hurricane resistance of the greenhouse technology was tested almost immediately when, shortly after installation of the greenhouse, Hurricane Ivan hit Jamaica. Damage from Hurricane Ivan was estimated at \$580 million, and many farmers lost all their crops and equipment. Rock Mountain Herbs had older greenhouses built according to an Israeli design, which used steel frames in cement foundations with fixed plastic sheeting. In contrast, the first UMES design used PVC piping with plastic draped over the structure. While the Israeli structure was damaged and the plastic shredded by Hurricane Ivan, the flexible greenhouses established by UMES were undamaged and RMH was able to collect and restore the plastic that had blown off and be back in production right after the storm.

## **Leveraging and partnerships**

In 2004 UMES provided a grant of \$15,000 to initiate further development of the project and capture private sector support. Public sector support for the JA-FARMS program was applied for in 2004, and an eighteen-month program was awarded in July 2006. With a

combination of investment and commitment to support the project from Jamaican agribusiness, the U.S. Agency for International Development (USAID) through the Global Development Alliance (GDA) funded the program. All told, funding and support for the JA-FARMS project came from UMES, Jamaican agribusiness, USAID/GDA Washington, USAID/Jamaica, the USAID Farmer to Farmer Program, U.S. volunteers, the Peace Corps, and the United Nations Development Programme (UNDP).

### **JA-FARMS progress**

For the JA-FARMS project, two MGMs were identified. RMH, mentioned above, is a woman-owned, vertically integrated agribusiness involved in greenhouse production, value-added processing, and supplying the fast food industry in Jamaica. The second MGM is Walkerswood Caribbean Foods Ltd. (WWCF), a community-based agribusiness involved in processing and exporting specialty foods.

Grower network expertise was provided by UMES staff to both of the MGMs. Assistance was also provided through numerous consultants on the development of technical packages for various crops. After twelve months of operation, the system grew to include twenty network growers, and it continues to grow. While RMH has no farmers producing in JA-FARMS-designed greenhouses currently, twelve contract growers supply RMH using open field production. The grower network has allowed RMH to increase revenue 50 percent over the life of the project. Most important, through a stable high-quality supply, RMH has expanded its market, capturing a greater share of the market from existing buyers and adding new markets with big box stores and high-end gourmet grocery stores. Income for farmers utilizing the fixed-price contract system with RMH has increased over 500 percent. Figures from March 2006 to March 2007 indicate that producers for RMH on average now earn a monthly income equivalent to an annual salary of US\$18,000. This meets the project's goal of providing a middle-class income for network growers.

Walkerswood Caribbean Foods (WWCF) is currently supplied by an association of eight growers called the Walkerswood Pepper Growers Association. This group is also using fixed-price contracting. This arrangement provides a stable supply of high-quality ingredients that WWCF uses in research and development for the creation of new product lines.

Hurricane Dean has meant hardship for many agriculture producers in Jamaica. Initial indications from the Jamaican government

are that the Hurricane Dean caused substantial damage to agriculture (*Jamaica Gleaner* 2007). However, not only did all of JA-FARMS' farmer-owned greenhouses survive the disaster, the crops inside the houses were undamaged. Because the FARMS business model connects small farmers with lucrative markets willing to pay a premium for reliability and high quality, the success of the greenhouse design under extreme weather is very important to the overall design of the model. It means participating farmers can serve their markets and deliver on the promise of providing a stable supply of high-quality produce, even while open-field agriculture crops are destroyed by high winds and torrential rains.

### **Private foundation support from Alcoa**

The JA-FARMS project has attracted the attention of Alcoa, Inc., a company involved in bauxite mining operations in Jamaica since 1959. Alcoa is interested in providing additional sources of stable income for rural families in the communities where Alcoa operates. The Alcoa Foundation is currently funding the establishment of a FARMS greenhouse incubator. This incubator will provide local farmers with a six- to twelve-month opportunity to be a network grower for RMH. At the end of this time, they will have an understanding of the income that can be derived by farmers through this business model. JA-FARMS is working with local financial institutions to provide credit for these farmers to establish their own greenhouses after they graduate from the Alcoa incubator.

As the JA-FARMS project approached the end of funding in December 2007, the pilot project was considered a success. Two network grower systems have been established with the goal of achieving a middle-class standard of living established for small Jamaican farmers. Capacity to support the business model is being established in the Jamaican business community. The openness of the commercial banking sector to provide loans for greenhouse facilities means that the model meets financial market requirements for repayment. A local builder of greenhouses has built numerous structures throughout the island, and these greenhouses all weathered Hurricane Dean, a Category 4 hurricane. The established networks with RMH and WWCF are demonstrating to Jamaican farmers the success of the model. This is being augmented by Alcoa's creation of an incubator, which will allow farmers to experience being a greenhouse grower prior to making the commitment to take a loan to build their own greenhouses.

## Media and Public Interest

Perhaps due to the photogenic nature of acres of flowers in bloom, media interest in the FARMS project has been considerable. Another reason may be the quick grasp of the concept by people on Maryland's Eastern Shore, which is home to a huge poultry industry. The FARMS model is derived from a model used in the poultry industry, where individuals and families "grow out" flocks of chickens supplied by large, vertically integrated agribusinesses such

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as Perdue Farms, Tyson, and Mountaire. The FARMS model is designed to benefit growers by providing them with more freedom to choose buyers, less capital outlay, and higher profits. Multiple newspaper, magazine, and television features about the project<sup>1</sup> have yielded a constant flow of domestic and international visitors to the UMES incubator greenhouse. This has had the ancillary benefit of introducing many people to the campus who might otherwise not have visited. The U.S. Department of Agriculture has pro-

duced five video news releases that have been broadcast nationally by satellite to local television news outlets. A sixth USDA news release featuring JA-FARMS was in production as this article went to press.<sup>2</sup>

## Conclusion

Building on its traditional role as a land-grant university with an expressed commitment to engagement with its community, UMES created a mechanism within the university to foster innovation and bring university knowledge to bear in strengthening and diversifying the local economy. The Rural Development Center has employed public/private collaborations that start small and are refined through repeated trials, public exposure, and the rigorous feedback of the marketplace. This approach has created a new business model that is changing the way agribusiness is done. Through the leadership of UMES, the Farmers Access to Regional Markets (FARMS) model is benefiting family farms on the Eastern Shore of Maryland and in rural Jamaica. In spring 2007, the University of the Virgin Islands signed a memorandum of understanding with UMES to bring the FARMS entrepreneurial model to that U.S. territory.

Because the problems FARMS addresses are found around the world, UMES is making this innovative model available to any rural community where economic development is stagnant and farming families struggle with outdated technology, low prices, lack of access to capital, and unreliable markets. Taking a market-based approach and working with both public and private sector stakeholders, the FARMS model offers a viable solution to millions of farming families living in poverty around the world.

## Endnotes

1. The following list is a representative sample of media coverage of the FARMS and JA-FARMS projects. In addition, local television stations' news programs have included numerous reports of developments at the UMES greenhouse.

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2. USDA video news releases about FARMS and JA-FARMS and UMES videos providing substantial detail about JA-FARMS are available at <http://www.skipjack.net/farms/>.

## **Acknowledgments**

The authors gratefully acknowledge the leadership of the late Dr. William P. Hytche and his foresight during his twenty-one-year tenure as president of the University of Maryland Eastern Shore in spearheading the creation of the Rural Development Center and envisioning its proactive mission on behalf of the region. The authors further credit the university's current president, Dr. Thelma B. Thompson, for championing entrepreneurial and market-based initiatives to engage the university more sympathetically and effectively with the private sector. Funders for the work described in this article are too numerous to list, but Richard M. Foster, in particular, deserves mention for his early recognition of the potential value of the network model concept, which led to a seminal grant from the W. K. Kellogg Foundation that enabled construction of the first hydroponic greenhouse at UMES. The work of the Rural Development Center is greatly facilitated by its administrative and physical location within Maryland Cooperative Extension, and for making that possible, the authors thank Dr. Henry M. Brooks. Within the UMES Department of Agriculture, the work of faculty member and extension specialist Dr. Thomas S. Handwerker needs to be acknowledged, for his enthusiasm in identifying appropriate technology, his one-on-one connections with farmers who became network members, and in the development of grower cooperatives. The authors would also like to acknowledge Weston Moses, whose hard work and exceptional cross-cultural skills have been vital to the success of the first international application of the FARMS model. Patrick O'Leary at the U.S. Department of Agriculture brought invaluable tools and talent to help us tell this story. Finally, for the deft and insightful editorial guidance offered by media specialist Katherine A. Harting, from the earliest days of the FARMS project and continuing through the preparation of this manuscript, the authors are most appreciative.

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## About the Authors

- Daniel S. Kuennen is the director of the Rural Development Center at the University of Maryland Eastern Shore. He is also Maryland Cooperative Extension Senior Agent, special assistant to the President for University Outreach and Community Engagement, and executive director of the Maryland Hawk Corporation, nonprofit affiliate of UMES. Since joining the university in 1990, Mr. Kuennen has contributed to over three hundred rural regional and community economic development projects and authored successful grant applications resulting in hundreds of millions of dollars for all phases of economic development, community infrastructure, and services. His work has gained him extensive experience in community projects; strategic planning with local and regional organizations; and small, micro, and minority business development. He oversees revolving loan funds totaling over \$14 million as well as millions of dollars of technical assistance project grants to rural communities. Before coming to UMES, he was a specialist in rural development with Delaware Cooperative Extension Service and the College of Urban Affairs and Public Policy at the University of Delaware. He earned an AB in political science from Saint Louis University, an MS in community development from Southern Illinois University, and an MA in public administration from the University of Delaware. In 1968–69, Mr. Kuennen was a U.S. Peace Corps volunteer in Brazil.
- Ronald G. Forsythe is vice president for technology and commercialization at the University of Maryland Eastern Shore, charged with identifying and creating new funding streams to support the growth of the institution. In this capacity, he manages the relationship between the university and its newly created affiliated nonprofit entity, the Maryland Hawk Corporation. Dr. Forsythe convened and led the team to create this research corporation to streamline the university's ability to provide contractual services to corporate and government clients, commercialize the university's intellectual property, rapidly spin off for-profit corporations, and facilitate economic development in the region. He oversaw a 98 percent increase in extramural support in less than four years, so his institution was ranked the top comprehensive university in the University System of Maryland in terms of actual extramural dollars received and funding per faculty FTE. Dr. Forsythe earned his bachelor of chemical engineering degree from the University of Delaware, and earned both his MS and PhD degrees in chemical engineering from the University of Maryland College Park.
- Will Bullock is president and cofounder of Global Development Initiatives, a nonprofit organization involved in rural economic development in emerging markets. In this capacity, Mr. Bullock is responsible for project and systems design, business development,

and operations. Mr. Bullock's international experience in agribusiness and rural development was earned leading operations in multiple countries based both overseas and in the United States and while working for both nonprofit and for-profit organizations. He has designed projects, procured funding, established new operations, and led international teams of development professionals in Africa, the Caribbean, Central America, Asia, the Middle East, and throughout the former Soviet Union. This work includes eight years' experience living and working overseas in emerging markets as well as working on Jamaica agribusiness development projects since 1999. Mr. Bullock has a BA in Russian area studies from the University of Iowa, is fluent in Russian, and earned his MBA from the George Washington University.