

25Farmer Network:

A Tennessee Model in New Farm Business Development Enterprises

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The Memphis Bioworks Foundation is pioneering a new model in the Mississippi Delta region for involving farmers in the discovery process of new agricultural opportunities. The *25Farmer Network* identifies progressive farmers, involving them in training and business development programs, engaging in crop development and business planning to mitigate risk and capture valuable on-farm ingenuity and experience. The introduction of new production, processing and collaborative value chain enterprises are essential. The *25Farmer Network* nonprofit model serves to mitigate the farmers' risk by gathering information, easing access to grants and contracts, building trust and cooperation, and providing educational opportunities for farmers to learn about new crops and farming models that provide additional income and stake in the agricultural process.

The American farmer at the crossroads

American farmers want options and opportunities beyond selling commodity crops such as corn, soybeans and cotton. The traditional American farmer is at the heart of a rapidly changing agricultural landscape. Whereas historically farmers have functioned solely as growers of one or two commodity crops, their role must evolve toward entrepreneurial participation in several steps along the agricultural supply chain from growing to processing to production. This transformation must occur in a concerted and consolidated landscape. The farmers' diversifying involvement can mean increased revenues and financial stability by retaining the added value of end products made from the raw materials they grow in their fields. In 2003, the Thomas Jefferson Agricultural Institute wrote the following:

The focus in many regions on just one or two crops has left crop farmers more vulnerable to weather, pests, and market forces which can erode their farming income. By contrast, the more diversified cropping systems used on some farms have been found to provide several benefits, including enhanced profit, reduced environmental impact, and better distribution of labor.¹

To accomplish this, farmers must learn to grow new crops to supply new markets in an emerging regional value chain that can bring urban and rural economic development. This strategy for the emerging bioeconomy is an economic development strategy throughout the supply chain, from farm to factory. In "New Crops, New Uses, New Markets," Patricia Barclay wrote that we can, "Grow more crops and manufacture products using these crops in factories close to the fields where the crops are grown." Indeed the Memphis Bioworks Foundation reached this very conclusion in The Regional Strategy

¹ (Strategies for Commercializing New Crops, n.d.)

for Biobased Products in the Mississippi Delta (2009). Among their findings are that a vertically integrated biobased production system would bring more than \$8 billion in revenue and more than 25,000 jobs to the Mid-South over the next decade.

The U.S. has historically been a leading agricultural exporter and a leading importer of processed products (Kilkenny & Schluter, 2001). However, in the emerging agricultural economy, several trends are clear: products will be locally and regionally grown and processed, retaining value closer to home for farmers, thus lowering the price to consumers and augmenting economic development in both rural and urban areas in the United States; manufacturing sectors will be reinvigorated; dependence on foreign oil for fuel and products will be reduced.

The changing face of agriculture means that the relationship between producers, processors and consumers must fundamentally change, and farmers in the United States must adapt in order to capitalize on the financial opportunities available in these emerging markets. This is especially true in the Mississippi Delta. Farmers have historically occupied the role of producing raw materials, removed from further stages of production along the supply chain. Integrating farmers into the bioproduction supply chain is not an overnight venture. Rather it is a process of developing new knowledge and skills beyond the mechanics of monocultural production. These steps include introducing new crops and new growing seasons, developing contractual relationships with brokers, and forming farmer cooperatives to build rural biorefineries to process the raw materials grown in the fields. Furthermore, the new entrepreneurial agriculture model involves building relationships not only with other farmers but also with colleagues in the manufacturing, logistics and distribution sectors and in academia and research institutions.

A 2007 Washington Post article on farming in the Mississippi Delta discussed an exodus of people from the region and those who remain, especially in agriculture, face precarious futures because of unemployment, poverty and lack of economic development.

"The problem with agriculture is that it's not a wealth builder for the people who live here," said John Greer Jr., director of the Mid-Delta Empowerment Zone in Leflore County. "It's a wealth builder for the few who own the property and the resources." But the farmers say they would not be able to survive without their subsidies. "I am not getting rich on subsidies," said G. Rives Neblett, a Shelby lawyer and businessman whose family has farmed here for three generations. Farms in which Neblett holds an interest have received about \$3 million in federal payments since 2001.²

Market forces and government policy changes are necessitating that farmers adapt to an evolving agribusiness environment.

² http://www.washingtonpost.com/wp-dyn/content/article/2007/06/19/AR2007061902193_pf.html

The Current and Projected Outlook for Farming

The face of farming is changing: the median age of farmers is increasing; more women and minorities are running farms; the industry is experiencing increased professionalization; and profits are growing in diversified local and niche markets.

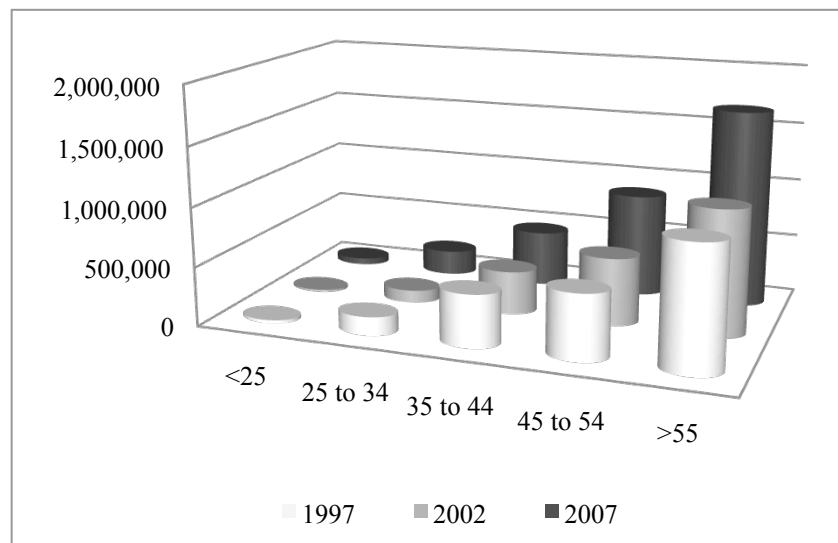
People

In 1908, two-thirds of Americans lived on farms. In 1990, less than two percent of Americans lived on a farm. The changing landscape of farming demography has wider implications for those directly involved with agriculture beyond redefining the agricultural commodity supply chain beyond increasing prices for existing crops.

The number of self-employed farmers is projected to decrease by eight percent through 2018 while the number of agricultural managers, i.e. individuals hired to run farms as businesses, is expected to grow by six percent over the next decade ("Farmers, Ranchers, and Agricultural Managers," n.d.). Family farms will be run more like businesses than traditional home operations.

However, while the number of farms has remained relatively unchanged, the participation of farmers has changed. Over the past decade, the median age of active farmers has grown progressively older, meaning that fewer young people are entering farming as a primary occupation.

Figure 1: Farmers by Age Group in the United States (US Census of Agriculture)



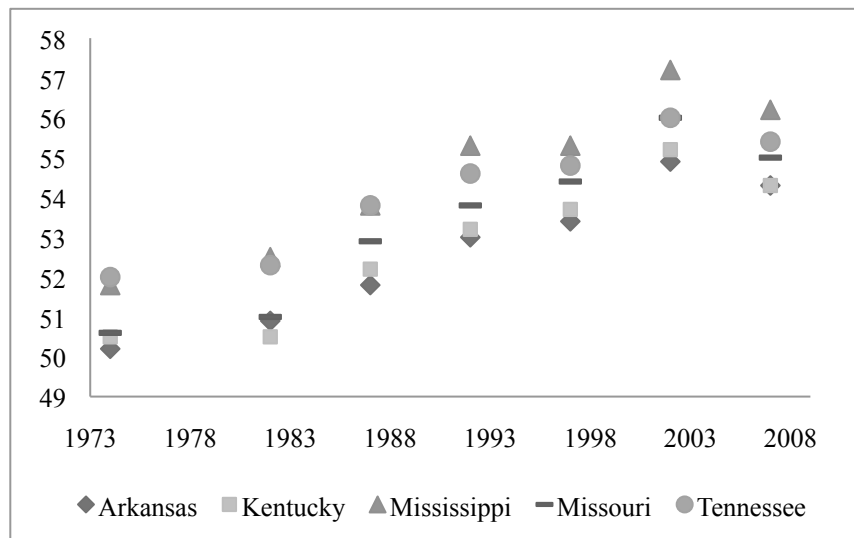
In the Mississippi Delta, it is clear that the rate of aging farmers is outpacing the entrance of new and younger farmers into the occupation. There is an important generational divide that marks the current agricultural phenomenon. Older farmers participate in traditional ways, growing commodity crops that are sold at market and where value is added beyond the farm gate. Young farmers must see hope for their future in farming in order to remain in the industry. Concurrent with the creative class movement in urban areas, agricultural workers also want to contribute to the economy by doing meaningful work. For example, in Texas the dramatic growth of the wind

power industry is seeing many rural young people stay “on the farm” to work not only for both financial and idealistic reasons in that their efforts contribute to a better vision of their community and world.

However, the financial barriers for young farmers, like land, equipment, seed and inputs, are expensive and cost-prohibitive in many cases without an organized farmer support system to mitigate some of the risk associated with modern agricultural enterprises.

Figure 2 shows that the average age of farmers has steadily increased over the past four decades, meaning that fewer young farmers are entering into the industry.

Figure 2: Average Age of Farmers in the Mississippi Delta States (USDA)



According to Farm Journal:

- Two-thirds of farms have been in a family for more than two generations and feel that maintaining family ownership is important.
- Three-fourths of farmers plan to transfer control of the farm operation to the next generation.
- One-fifth of farms are confident in their succession plan.
- 2 in 5 farms do not have a succession plan.

One of the central concerns of the aging farmer population is the upcoming generation. The problem is one of matching interests and assets. Some farmers’ children do not want to continue the family farm. Other young adults want to become farmers, but face steep entry costs, like acquiring land and equipment. Matching young people’s potential with the wisdom, experience and assets that older generations possess is a sound agricultural strategy.

The Farm Journal Legacy Project is one endeavor that seeks to help farm families plan for the future. The Center for Rural Affairs coordinates a Land Link Services, another

process whereby elder and younger farmers are matched. Older farmers are characteristically risk-averse and are more likely planning retirement rather than new entrepreneurial strategies. Younger farmers, especially those with two-year or four-year degrees, who are partnered with lifelong farmers can bring managerial and technological experience, adding value to the farming enterprise.

Land

Figure 3 shows that cotton acres harvested have been steadily declining over the past decade. The 2009 harvest was amongst the worst in recent years due to unstoppable rains.

Figure 3: Cotton Acres (1000) Harvested in the Mississippi Delta (USDA-NASS)

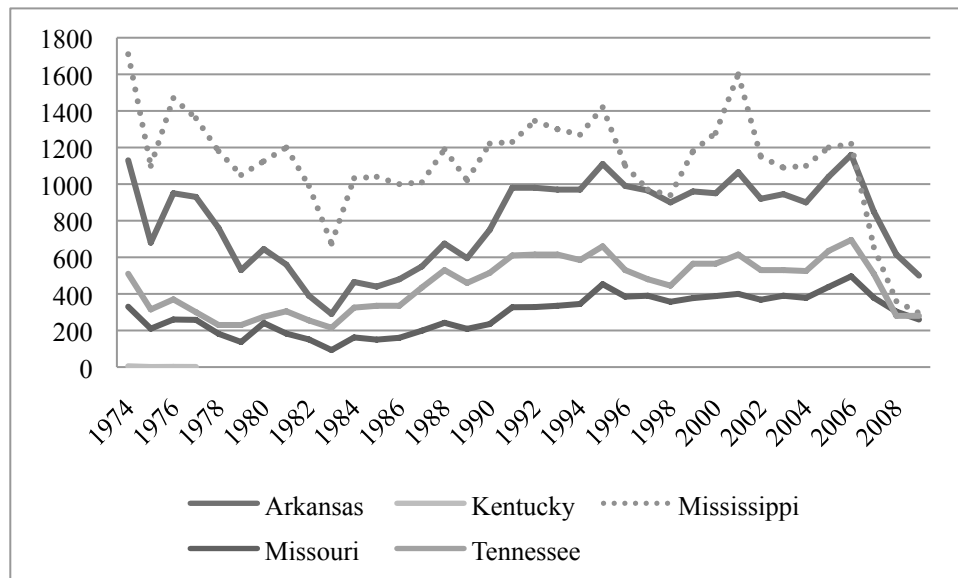
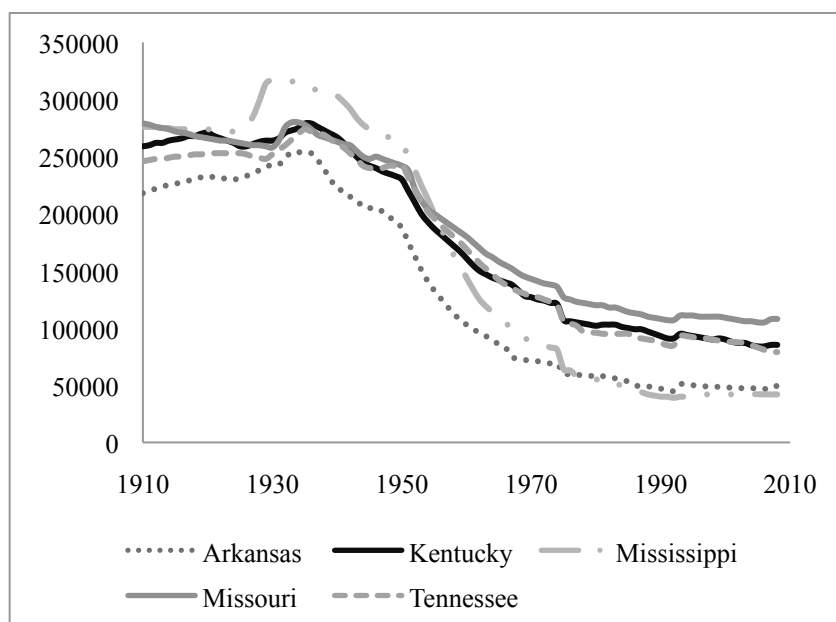


Figure 5 shows that while the overall number of farms in the Delta region has decreased over the past century, in the past forty years the numbers of farms have remained relatively stable.

Figure 4: Number of Farms in the Mississippi Delta Region 1900-2008 (USDA)



Markets

The Bureau of Labor Statistics recently identified several agricultural trends for the next decade: modern farming requires knowledge of new developments in agriculture gained experientially or through postsecondary education; overall employment is expected to decline because of increased productivity and farm consolidation; the best opportunities for farmers rest in small-scale local farming.⁴

The changing nature of agribusiness, however, dictates that the farmers become more involved not only in crop production, but in the post-harvest processes that add value to the raw material, which can include actual processing, specialty production under contract, and identity preservation.

Moran et al discuss the organization of production and distribution beyond the farm gate in New Zealand in light of the importance of the family farm. Producer marketing boards are “an attempt to remove the middleman from the agrocommodity chain in order to retain more profit.” They suggest three strategies: first, farmers need to sell and act as processors and wholesale marketers, they capture a higher proportion of value added; second, producer marketing boards smooth profits across enterprises at different stages of their development; and third, joining together to market their produce, the boards restrict competition among groups of family farmers (Moran, Blunden, & Bradley, 1996).

⁴ <http://www.bls.gov/oco/ocos176.htm>

Vertically-integrated Agricultural Operations: Adding Value for Farmers

Iowa agricultural producers and officials have expressed the understandable hopes that value-added agricultural production will provide high-wage jobs and more off-farm employment, create new sources of farm income for small farming operations, and make the state more attractive to job seekers. Agricultural commodity processing (ACP)

While traditional 20th Century agriculture in the United States has focused on commodification of crops through specialization and mass-production, the new agri-economy requires that farmers diversify their skills. In the past, farmers have been relatively isolated from the downstream supply chain and are remunerated for only the value of the raw material rather than its post-processing value.

Due to fluctuations in weather and other factors influencing the quality and quantity of commodity crops grown, farmers' incomes often vary by year. Farmers also receive government-sponsored agricultural subsidies, and many supplement their farm income with other sources as well.⁵

Many observers regard value-added production as a way to keep more value of a commodity within a local economy and, thereby, stimulate economic growth and development. Much of the current discussion of value-added agricultural and rural development focuses on two general categories: 1. Value-added food products that offer or are perceived to offer higher quality, better nutrition or greater convenience; and 2. Industrial, non-food value-added products derived from grains, oil seeds or non-traditional plants (Cowan, 2002).

The farm value share has declined over the years due to large supplies of farm products holding down farm prices while increased expenditures for food marketing services have caused retail food expenditures to rise.⁶ Canadian historian Brett Fairbairn writes that, "There are certain points in marketing chains where power and wealth can best be extracted. Every marketing chain runs from producers, through processors and distributors, to end-users. Increasingly, for agricultural products, there is wealth and power in the middle of these chains that does not necessarily flow to the producers on one end or the consumers on the other (Fairbairn, 2003)."

Because of evolving consumer preferences, like genetic traits and locally sourced food⁷, farmer cooperatives may be able to deliver unique products. Farmers markets are an example of value-added agriculture and farmer cooperatives. Figure 6 shows that over the past fifteen years, the number of farmers markets nationwide has tripled.

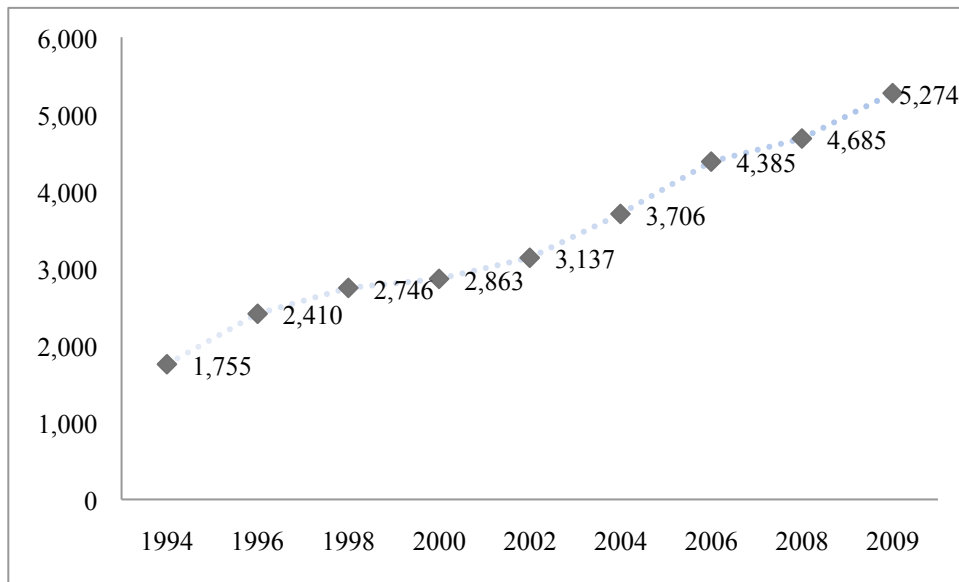
⁵ Full-time, salaried agricultural managers had median weekly earnings of \$775 in 2008. The middle half earned between \$570 and \$1,269 per week. The lowest paid 10 percent earned less than \$358, and the highest paid 10 percent earned more than \$1,735 per week.

⁶ <http://www.ers.usda.gov/data/FarmToConsumer/definitions.htm>

⁷ <http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateS&navID=WholesaleandFarmersMarkets&leftNav=WholesaleandFarmersMarkets&page=WFMFarmersMarketGrowth&description=Farmers%20Market%20Growth&acct=fmrdirmt>

As markets (commodity market prices) decline, bargaining power increases, and farmers need collective arrangements to bargain for fair prices with their processors. While most farm output is sold to food-processing companies, some farmers—particularly operators of smaller farms—may choose to sell their goods directly to consumers through farmers’ markets. Some use cooperatives to reduce their financial risk and to gain a larger share of the prices consumers pay (“Farmers, Ranchers, and Agricultural Managers,” n.d.).

Figure 5: Number of Operating Farmers Markets in the U.S. (USDA)



However, many of the large farms are much too small to compete with the large grain processors, but are also too large for developing a farmers’ market program. These farms may consider developing relationships with companies developing alternative, biobased products in which specialty ingredients will be required. There may also be opportunities for farmer-owned processing ventures.

Groups such as Cargill and also McKinsey and Company have estimated that about two thirds of all chemicals can be produced from renewable materials. Thus the potential sustainable chemistry market is roughly \$1 trillion, and there is a potential to develop and commercialize about 50,000 new products⁸.

Farmer Organizations Help Farmers Meet New Challenges and Maximize Benefits

A key component of the value chain is the interaction with the farmers and agricultural processors. Biorenewable industry proponents tend to promote the ability of biorefineries to revitalize rural regions without identifying vital farmer linkages. At present, there are three models that demonstrate how companies and processors access lignocellulosic biomass (Nelson 2006). First, the farm gate model pays farmers a set price and/or a contracted price for biomass baled and delivered to the factory, storage

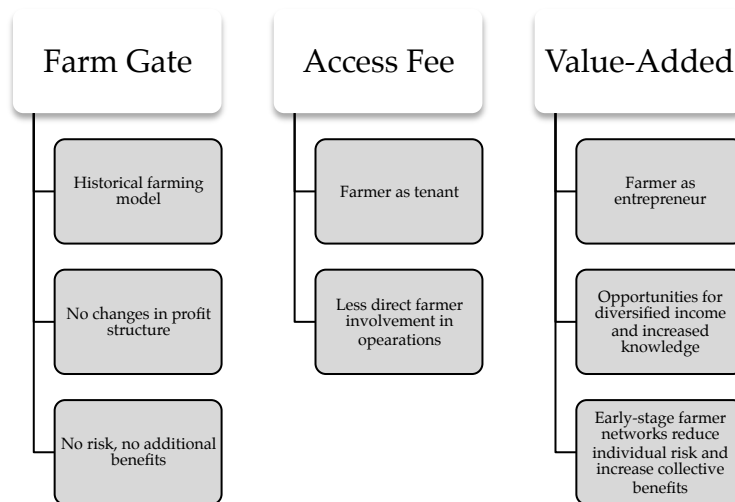
⁸ “Synthetic Biology and the Sustainable Chemistry Revolution.” Jarrell, Kevin A. Modular Genetics, Industrial Biotechnology (Winter 2009).

site, or made available at the field for pickup. Generally this price is between \$30-70 per dry ton. According to farmers, it is clear that this model only works if farmers are given an independent ability to market carbon credits, have their contract price (especially for perennial energy crops) indexed to corn or petroleum, and have a guaranteed price floor.

The next model is based on an access fee, and farmers are essentially landowners, similar to the pulp and paper industry. In this model, companies pay to have dedicated energy crops produced as well as managing the planting and harvesting. Although the farmers may have some role in maintenance, they essentially operate as absentee landowners.

Finally, the value-added model situates farmers as the crux of the value-added enterprise where their biomass production is matched with logistics, processing, value-added products and other services to end clients. Two good examples of this model are the Show Me Energy Cooperative and the Kengro Corporation.

Figure 6: Farm Models



Each of these three models offers farmers a way to participate in the changing agricultural and biorenewable industries. Each model offers a range of challenges and benefits to farmers. The value-added option is one, which diversifies income and opportunities for farmers, but this model requires a concerted, process-oriented effort to coordinate assets and goals. Farmer cooperatives like Kengro and Show Me Energy represent well-organized, vertically integrated organizations. However, these do not happen overnight, especially in a region with historically dubious opinions about such collaborations.

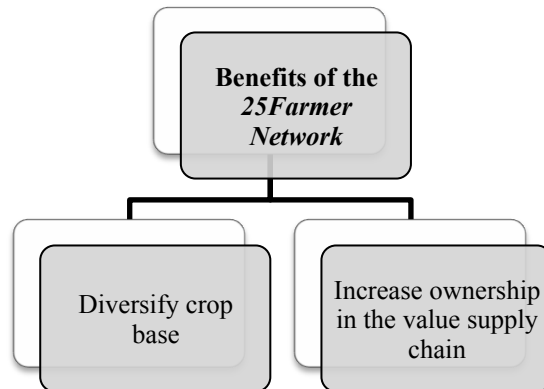
To diversify and adapt to changing markets, farmers need support.

Over the past 70 years, U.S. agricultural cooperatives have struggled to find their place relative to other firms in the American economy, a challenge that reflects their mandate to further economic opportunities for family farmers (Hogeland, 2006).

However, entrepreneurial farmers who choose the value-added model are not guaranteed success in the marketplace. This model requires cooperation and coordination of activities that are presently rare amongst farmers.

Farmers have been characteristically risk-averse and individualistic, which isolates them from opportunities to increase their share of the profit from the crops they grow. Some farmers want to try new models, but the opportunity cost for initiating a farmer cooperative is high.

Figure 7: Advantages of the 25Farmer Network Model



An alternative to forming a high-risk farmer cooperative is to form a farmer network, managed by a third party who assists the farmers in securing contracts, gathering information, providing educational forums to learn about new crop and business opportunities and mitigating their risk. Joining a farmer network still involves a degree of risk; however, the risk is mitigated by a gradual approach to change and by the lower cost of participating. This allows farmers to investigate and learn about new opportunities at a lower opportunity cost, while building trust and relationships that can develop into cooperative venture. Figure 7 describes these relationships:

Figure 8: Cost and Benefit of Farmer Organizations

	Farmer Cooperative	Farmer Network
Cost (Information, financial)	High	Medium
Risk	High	Mitigated
Benefits	Financially uncertain	Financially uncertain; experientially and intellectually positive

By joining a farmer network, participants are guaranteed to increase their knowledge and awareness of short- and long-term opportunities as well as grow new crops and establish relationships with other like-minded farmers. A farmer network builds intellectual and social capital as well as trust while benefiting the group as a whole.

In the long run, successful farmer networks can lead to successful farmer cooperatives and other farm-based businesses. Lang et al note that farmer cooperatives, i.e. user-owned, user-controlled and user-benefit businesses (Lang, 1995),⁹ and local contracts can help mitigate the risk of price fluctuations, as well as the increasing importance of 2-year and 4-year degrees in agricultural and related fields, coupled with intern- and externships on farms.

The role of the farmer network will emerge and will be filled by enterprising businesses and nonprofits that can serve as facilitators to build the networks and work as “business developers” on behalf of the farmers.

Despite the expected continued consolidation of farmland and the projected decline in overall employment of this occupation, an increasing number of small-scale farmers have developed successful market niches that involve personalized, direct contact with their customers (“Farmers, Ranchers, and Agricultural Managers,” n.d.).

Indeed by the early 21st century, cooperatives were including others besides farmers as stakeholders in the cooperative system because farmer investment alone could no longer provide the capital-intensive production and distribution systems needed by contemporary farmers (Hogeland, 2006).

Some researchers feel that cooperatives can enhance the survivability of small farm operations by achieving economies of scale in input and output operations, while also noting that technology and price relatives may render them fragile (Lang, 1995). Lang highlights two key points about cooperatives: first, that industrialization weakens the ability of producers to create value, and that through traditional cooperatives, the farmers have no way to capture the “*residual value of variation in their product* (pp. 1163).” When producers, i.e. the entrepreneurial farmers, own the production process, they maintain control over the value-added products.

The logic of supply/value chains opens the potential for small-scale value-added producers to achieve more competitive scale economies by connecting small-scale processors or niche market producers to equally small-scale IP raw material producers (Cowan, 2002).

⁹ Does location matter? Lang (1995) argues that cooperatives have an optimistic outlook, but cites California as an example. California has stringent ALRB standards, and there is concern that experience with formal farm labor organizing may affect the prospects of farmer cooperatives. Simply, are cooperatives more likely to work in non Right-to-Work states, or does that matter?

Figure 9: Farm value share of expenditures in percent (USDA)

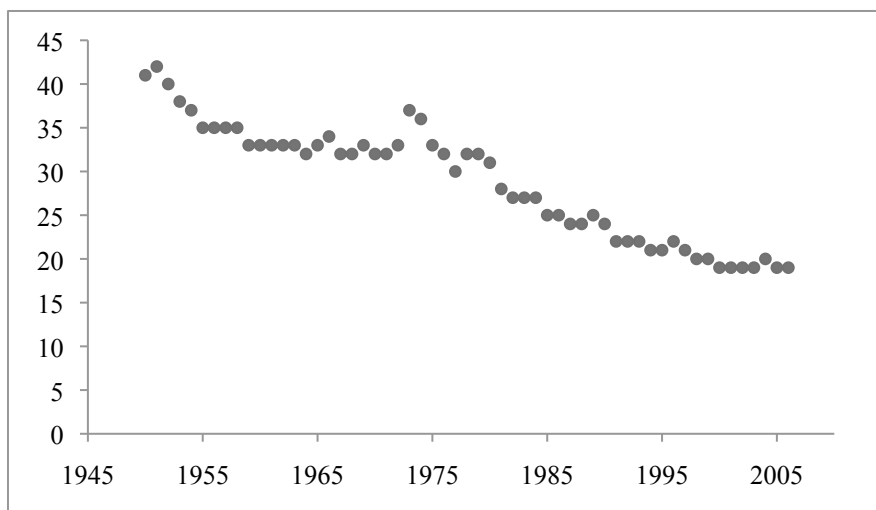


Figure 8 shows the decline in the share of the value from agricultural production that farmers receive. Farmers today receive half of what they received fifty years ago as agricultural producers.¹⁰ This means farmers are compensated less for agricultural production while others who make and distribute end products from the crops, like food, feed, fuel and products, are compensated proportionally more than a century ago, and more than farmers presently. The result of farmers' earning less is rising poverty and unemployment, as well as an erosion of economic development that affects both rural and urban areas.

Rogers and Marion conclude that, "It is logical that cooperatives are most heavily involved in first-stage marketing and food processing activities" which will be most beneficial to the farmer by assuring markets for products.

These alternatives constitute a business development strategy that integrates the farmers into a value-added supply chain. In 2002, a congressional report clarified the concerns about farmers' contribution to the supply chain:

From 1910 to 1990, farmers' share of the overall GDP of the food and fiber system fell from 21% to 5%, while the share contributed by the agricultural input and distribution subsectors rose from 13% to 30%.¹¹

Fairbairn makes some suggestions for farmers to adapt to the changing landscape of American commodity agriculture: first, farmers must work with policymakers and government officials to regulate their industry and protect their autonomy; second; they must create formal farmer networks and organizations to bargain with processors and middlemen; and third, farmers can acquire ownership and control in the processing and handling industries. Fairbairn notes the importance of contractual relationships, asking,

¹⁰ This is calculated as the percent that farmers receive from what consumers pay for value-added goods from agricultural productions.

¹¹ (Cowan, 2002)

“So what happens when there is no longer a meaningful market to provide a price yardstick for contracts?”

Farmers will continue to exist in the new agriculture, and will not be replaced by corporations or machines. However, they are not guaranteed to prosper. It is quite possible to retain tens of thousands of farmers on the land, eking out an existence, while the real power and profits go to others. Indeed, this seems a reasonable description of where we are now. Contractual relationships between producers and processors will not necessarily make this trend better, unless the underlying issues of control and bargaining power are taken into account (Fairbairn, 2003).

As Lang notes, “To survive, many cooperatives must add value to their products as they compete in more refined consumer markets with many different partners and in a global marketplace (pp 1164).” These processes include building decentralized biorefineries throughout the Mid-South to process the new crops, establishing manufacturing centers to make biobased products, and leveraging the region’s logistics and distribution capacity to deliver the products worldwide. According to Steve Bares, President and Executive Director of the Memphis Bioworks Foundation, “Companies with a need for biomass will [re]locate near where the biomass is.” Thus, paraphrasing one author, the need for the eco-economy’s newest mogul – the entrepreneurial farmer – is borne.

Through vertical integration, industrialization created a need for cooperatives to link other stages of production and marketing to the farm on a more systematic basis than had previously occurred within a production agriculture composed of independent farmers (Hogeland, 2006).

Old co-ops dealt in spot markets and commodities and limited farmers to early stages of the supply chain: farm supply and first-stage commodity handling. New co-ops will be more specialized and interlinked along the supply chain, addressing specific consumer markets and stressing quality, niches and special characteristics of crops (Fairbairn, 2003). Strategies for Commercializing New Crops suggests that the new generation of agricultural cooperatives involves farmers themselves investing equity into a bioprocessing facility whereby only they have the rights to deliver new crops to that facility. The report states that, “This control over processing can effectively eliminate the overproduction symptomatic of the new crop ‘boom-bust’ cycle (*Strategies for Commercializing New Crops*, n.d.).”

Responding to the Regional Projected Trends: The 25Farmer Network

While this process involves a steep learning curve for traditional farmers, the agricultural, ecological and financial benefits provide meaningful long-term incentives. As many of these novel partnerships are premature in the marketplace, gradual exposure to these new ideas in a structured, concerted format will ease their adoption. The Memphis Bioworks Foundation and AgBioworks have formed a model program to involve farmers in the discovery of a new agricultural model in the Mississippi Delta.

The *25Farmer Network* is coordinated by a third-party group called AgBioworks which is a joint project between BioDimensions and the Memphis Bioworks Foundation. AgBioworks provides the farmers with educational opportunities, secures contracts for growing experimental crops, facilitates forums for farmers to share their experiences and expertise, disseminates current information regarding policy developments, and coordinates crops data and research for the farmers.

The *25Farmer Network* is a Mid-South success story that positions farmers from 21 counties in West Tennessee to supply the raw materials for food, biofuels and biobased products by growing new and diverse crops. The network was initiated in 2008 as a project of AgBioworks, itself a partnership between two innovative companies, the Memphis Bioworks Foundation and BioDimensions, operating from a grant from the Tennessee Department of Agriculture. The *25Farmer Network* is the first step in realizing the core mission of AgBioworks: to develop a regional biobased supply chain from the field to the factory, utilizing natural resources, technology and assets in infrastructure, manufacturing, logistics and distribution in the Mid-South. Farmers are the starting point for the regional economic development strategy.

Twenty-five farmers were recruited to participate in this PILOT program, including the Mayor of McNairy County Jai Templeton and Eric Maupin, the Tennessee Young Farmer of the Year in 2009 and President of the Tennessee Soybean Promotion Board.

Mr. Templeton reports positive experiences with the *25Farmer Network*:

“A third-party, nonprofit agency is best able to help farmers make the transition from being independent producers to a coordinated group of individuals for several reasons. First, a nonprofit is seen by farmers as non-competitive in the market and prioritizes the group’s interests – not an individual’s interests. A non-profit is able to seek additional funding through grants and governmental agencies to progress the farmers’ interests forward. It is also able to manage contracts and negotiate with other entities to promote the farmers’ products.

A non-profit provides the group of farmers with education and novel expertise in the field, like exposure to new crops, policy changes, and emerging trends in the marketplace. The nonprofit’s role is really one of facilitator, lowering the risk and cost of entry into the group for farmers, piquing interests, and lending a helping hand to farmers who want to increase their share of the profit from their agricultural products. The nonprofit is the glue that holds together this emerging agricultural enterprise and new entrepreneurial farmers, and its neutrality and impartiality best serves all participants.

The farmers in the 25Farmer Network have demonstrated tremendous commitment to this process and maintained interest and dedication several years into the project. Unlike other ideas which have come and gone quickly, the 25Farmer Network is still thriving and has great support from its members.”

The farmers are reimbursed \$500 per acre up to five acres to grow two types of new crops: new crops to the region, and new crops to agriculture. The first category of new crops includes canola, sunflowers and switchgrass; the second category includes miscanthus, lesquerella and camelina.

The theory behind the 25Farmer Network is to build on small successes. Organizing a group of farmers to dedicate a small portion of land to new crops accomplishes several things: it establishes baseline yields and familiarizes farmers with planting, tending and harvesting the new crops; it develops relationships between farmers in the program as well as between farmers and industry professionals throughout the supply chain; it educates farmers about business opportunities and industry trends for adding value to the raw materials they grow; and it mitigates the risk of experimentation by providing financial incentives to participate in the program. Participants in the 25Farmer Network also attend nationwide conferences to learn about opportunities in the emerging bioeconomy develop relationships with other farmers, suppliers, scholars and policymakers.

Within a few years, it will be possible to bring the experimental five-acre plots up to scale, increasing acreage to several hundred or even thousand. Growing more crops means building the supply-chain infrastructure to refine, process and manufacture the biobased end products. Some of these end products include automobile parts, lubricants, biobased plastics and paints as well as biofuels.

IP (identity preserved) traits may create non-farm employment in areas where employment is scarce as well as enhance the economic viability of local businesses that service the new facilities. On the other hand, other facilities (e.g., ethanol plants, soy oil, meat packing) owned by external investors, could offer relatively little in the way of long-term local development beyond improving incomes of some farm households selling bulk commodities to the facility or to those who find work in the manufacturing facility (Cowan, 2002).

Conclusions

Farmers who want to increase their share of profit from agricultural production face many challenges in moving from their present contractual situations to more financially favorable ones. While the opportunity cost of starting a cooperative is high, other strategies are possible that mitigate risk for the farmer and increase the potential for retaining a greater percentage of the value of their work.

Key Findings Summary

- The agricultural policy landscape is changing, as is the nature of the relationship between farmers, processors and distributors. The farming population is rapidly aging, and it is becoming more diverse with increased representation among women and minorities.
- Traditional commodity crops in the Mississippi Delta are in decline, threatening the stability of jobs along the supply chain from rural to urban areas.
- Possibilities for value-added agriculture are abundant, but producers face challenges to implementing emerging best practices in the field that could supply a range of biobased products for food, fuel and products.

- Billions in revenue and tens of thousands of jobs are possible in the Mid-South in the regional biobased supply chain, and this is predicated on the requirement of adding value for farmers and local producers.
- The value chain requires an entity to mitigate risk for farmers, centralize and coordinate efforts, gather information, and identify opportunities in ancillary industries.

Strategies for taking advantage of the present agricultural opportunities and meeting the emerging challenges facing farmers include the following:

1. Expand the 25Farmer Network to the other states in the 98-county study region with decentralized offices to develop a regional institutional network and facilitate increased participation among participants along the value chain.

Ideally, each state will have a regional farmer network akin to the 25Farmer Network in Tennessee, coordinated by AgBioworks, that provides the risk-mitigating support which farmers require to transition from the current commodity crops industry to a diversified range of crops including those with dedicated energy uses.

Additionally, the region would benefit from a biobased trade association to keep members apprised of investment opportunities and regulatory policy changes, to disseminate information, and to provide a regional network for participants at various points along the regional value supply chain.

2. Develop the capabilities for older farmers to transmit agricultural knowledge, networks and property to younger generation of farmers who presently lack both the financial, skill and capital resources to participate.

As a compendium to developing a regional farmer network and trade association, implementing a program to connect younger and older farmers with complementary skills and assets would benefit the region in the short- and long-term.

3. Establish a centralized agricultural research center to coordinate research on crop trials and provide timely and relevant information to producers and policymakers regarding agricultural developments.

References

- 25Farmer Network — Alternative crops. (2009, May 5). . Retrieved December 15, 2009, from <http://deltafarmpress.com/biofuels/alternative-crops-0505/>.
- 25FarmerNetwork,Agbioworks,2008.pdf. (n.d.). . Retrieved December 15, 2009, from <http://www.agbioworks.org/pdfs/25FarmerNetwork,Agbioworks,2008.pdf>.
- Abelson, P. H. (1994). Continuing Evolution of U.S. Agriculture. *Science*, 264(5164), 1383.
- Are Farmer Bankruptcies A Good Indicator of Rural Financial Stress?* (1996). . Economic Research Service/USDA.
- Barclay, P. A. (1992). *Opportunities for Rural Economic Growth*. New Crops, New Uses, New Markets (pp. 69-74). Washington, DC: US Department of Agriculture. 2.
- Barnes, D. M., & Ondeck, C. E. (n.d.). University of Wisconsin Center for Cooperatives - Capper-Volstead Act. Retrieved January 12, 2010, from <http://www.uwcc.wisc.edu/info/capper.html>.
- Capper–Volstead Act - Wikipedia, the free encyclopedia. (n.d.). . Retrieved January 12, 2010, from http://en.wikipedia.org/wiki/Capper%E2%80%93Volstead_Act.
- Census of Agriculture Shows Growing Diversity in U.S. Farming. (n.d.). . Retrieved December 16, 2009
- Christiansen, R. (n.d.). Covering Your Grass - Ethanol Producer Magazine. Retrieved December 15, 2009, from http://www.ethanolproducer.com/article.jsp?article_id=5826.
- Cook, M. L. (n.d.). The Future of U.S. Agricultural Cooperatives: A Neo-Institutional Approach. *American Journal of Agricultural Economics*, 77, 1153-1159.
- Cowan, T. (2002). *Value-Added Agricultural Enterprises in Rural Development Strategies*. United States Congress: Congressional Research Service.
- Dyersburg State Gazette: Local News: Maupins named Tennessee Young Farmers of the Year. (n.d.). . Retrieved December 15, 2009, from <http://www.stategazette.com/story/1586969.html>.
- Fairbairn, B. (2003). *The Role of Farmers in the Future Economy*. Centre for the Study of Cooperatives: University of Saskatchewan.
- Farmers, Ranchers, and Agricultural Managers. (n.d.). . Retrieved January 4, 2010, from <http://www.bls.gov/oco/ocos176.htm>.
- Fletcher, R. (n.d.). International New Crop Development Incentives, Barriers, Processes And Progress: An Australian Perspective. Retrieved January 11, 2010, from <http://www.hort.purdue.edu/newcrop/ncnu02/v5-040.html>.
- Fogel, R. W., & Engerman, S. L. (1997). Explaining the Relative Efficiency of Slave

- Agriculture in the Antebellum South. *The American Economic Review*, 67(3), 275-296.
- Gaul, G. M., & Morgan, D. (n.d.). A Slow Demise in the Delta. Retrieved January 24, 2010, from http://www.washingtonpost.com/wp-dyn/content/article/2007/06/19/AR2007061902193_pf.html.
- Gibson, L. (n.d.). 25Farmer Network plants new crop trials - Biomass Magazine. Retrieved December 15, 2009, from http://www.biomassmagazine.com/article.jsp?article_id=2704.
- Hogeland, J. A. (2006). The Economic Culture of U.S. Agricultural Cooperatives. *Culture & Agricultur*, 28(2), 67-79.
- Hoppe, R. (n.d.). The Importance of Farm Program Payments to Farm Households - Amber Waves June 2007. Retrieved January 4, 2010, from <http://www.ers.usda.gov/AmberWaves/June07/Features/FarmProgram.htm>.
- Janick, J., Blase, M. G., Johnson, D. L., Jolliff, G. D., & Myers, R. L. (n.d.). Diversifying U.S. Crop Production. Retrieved January 11, 2010, from <http://www.hort.purdue.edu/newcrop/proceedings1996/V3-098.html>.
- Johnson, D. G. (1997). Agriculture and the Wealth of Nations. *American Economic Association*, 87(2), 1-12.
- Keys to Success in Value-Added Agriculture. (n.d.). . Retrieved January 4, 2010, from <http://attra.ncat.org/attra-pub/keystosuccess.html>.
- Kilkenny, M., & Schluter, G. (2001). Value-Added Agriculture Policies Across the 50 States. *Rural America*, 16(1).
- Lang, M. G. (1995). The Future of Agricultural Cooperatives in Canada and the United States. *American Journal of Agricultural Economics*, 7, 1162-1165.
- Lewis, F. D. (1979). Explaining the Shift of Labor from Agriculture to Industry in the United States: 1869 to 1899. *The Journal of Economic History*, 39(3), 681-698.
- Melvin, L. (n.d.). West Tennessee farmers plant seeds of alternative-fuel future» The Commercial Appeal. Retrieved December 15, 2009, from <http://www.commercialappeal.com/news/2009/may/10/focus-farming-grass-for-gas/>.
- Memphis Bioworks Foundation's AgBio Farmer Network Announces Alternative Corps Initiative for Spring | TN.gov Newsroom. (n.d.). . Retrieved December 15, 2009, from <http://news.tennesseeanytime.org/node/1672>.
- Moran, W., Blunden, G., & Bradly, A. (1996). Empowering Family Farms Through Cooperatives and Producer Marketing Boards. *Economic Geography*, 72(2), 161-177.
- Mundlak, Y. (2005). Economic Growth: Lessons from Two Centuries of American Agriculture. *Journal of Economic Literature*, 43(4), 989-1024.

- Robinson, E. (n.d.). Bio-initiative looking for 'a few good farmers' | Governor's Task Force on Energy Policy. Retrieved December 15, 2009, from <http://www.tennesseeanytime.org/energy/node/441>.
- Schill, S. R. (n.d.). Tennessee group launches 25Farmer Network - Biomass Magazine. Retrieved December 15, 2009, from http://www.biomassmagazine.com/article.jsp?article_id=2058.
- Snipes, C. E., Nichols, S., Poston, D. H., Walker, T. W., Evans, L. P., & Robinson, H. (2005). *Current Agricultural Practices of the Mississippi Delta*. Mississippi State University: Office of Agricultural Communications.
- Snow, D. (n.d.). Critical Bio Mass | BusinessTN. Retrieved December 15, 2009, from <http://businessstn.com/content/200810/critical-bio-mass>.
- Strategies for Commercializing New Crops*. (n.d.). Report of a Workshop. Funded through the USDA-CSREES Fund for Rural America Program, St. Louis, MO: Thomas Jefferson Agricultural Institute.
- Stroup, R. L. (2000). Free Riders and Collective Action Revisited. *The Independent Review*, IV(4), 485-500.
- Tennessee Farmers Producing First Commercial Trials of Bioenergy Crops | BiobasedNews.com. (n.d.). Retrieved December 15, 2009, from <http://www.biobasednews.com/node/21730>.
- Tugwell, G. (1924). The Problem of Agriculture. *Political Science Quarterly*, 39(4), 549-591.
- U.S. Department of Agriculture. (1992). Agricultural Biotechnology and APHIS Regulations: A Pathway to the Future. In *New crops, new uses, new markets*. U.S. Department of Agriculture.
- Urbanchuk, J. M., & Kapell, J. (2002). *Ethanol and the Local Community*. Renewable Fuels Association.
- Walford, N. (2003). A Past and a Future for Diversification on Farms? Some Evidence from Large-scale, Commercial Farms in South East England. *Geografiska Annaler: Series B, Human Geography*, 85(1), 51-62.