

Journal of Rural Social Sciences

Volume 02

Issue 1 *Southern Rural Sociology Volume 2,*
Issue 1 (1984)

Article 4

12-31-1984

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Recommended Citation

Sollie, Carlton, and Wolfgang Frese. 1984. "Mainline and Peripheral Agriculture: Toward Generic Classification of Farms." *Journal of Rural Social Sciences*, 02(1): Article 4. Available At: <https://egrove.olemiss.edu/jrss/vol02/iss1/4>

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**MAINLINE AND PERIPHERAL AGRICULTURE:
TOWARD GENERIC CLASSIFICATION OF FARMS¹**

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ABSTRACT An examination of the state of the art in the classification of farms indicates a need for more work. Classification of farms by size has been widely used and found serviceable. In a capitalistic social system, such as the United States, the most appropriate measure of the relative contributions of farms of different sizes appears to be the market value of products they sell. Accordingly, a preliminary generic typology of U.S. farms, based on published data, is proposed in which Mainline, Marginal, and Peripheral types are identified.

Introduction

The problems of definition and classification have long plagued observers and students of the American agricultural system. This is understandable when one recognizes that the topic is a complex, changing phenomenon, and that some of the most revered social values of American society are embedded in the agricultural system. The concept of family farm, for example, evokes sentiments not unlike those evoked by the concepts of motherhood and apple pie. The Congress of the United States, leaving no doubt about its awareness of social values associated with the family farm, stated in the Food and Agricultural Act of 1977:

Congress hereby specifically reaffirms the historical policy of the United States to foster and encourage the family farm system of agriculture in this country. Congress firmly believes that the maintenance of the family farm system is essential to the social well-being of the nation and the competitive production of adequate supplies of food and fiber.

Apart from the historically established sentiments usually associated with the concept of family farm--

¹A version of this paper was presented at the annual meeting of the Rural Sociology Section of the Southern Association of Agricultural Scientists, Nashville, February 1984. Support for the study was from the Mississippi Agricultural and Forestry Experiment Station as a contribution to Hatch Project 4107 and Southern Regional Project S-148. The authors gratefully acknowledge the comments and suggestions of two anonymous reviewers.

sentiments such as independence, self-reliance, and being in tune with nature--the notion of what constitutes a family farm has not been constant throughout the history of this nation (Brewster, 1979:74). The Jeffersonian model of colonial days was subjected to forces that led American farmers into the marketplace and thus to commercialization of the agricultural system. Even though the definition of the concept of family farm has not remained constant, it is still the dominant type of farm in the United States. The most recent agricultural census report (1978) classified almost 90 percent of the farms in the nation as family farms, those on which fewer than 1.5 man-years of labor are hired annually (Brewster, 1979:78). However, this was a heterogeneous group of farms, including more than 600,000 with gross sales of less than \$2,500 and more than 200,000 with gross sales of \$100,000 or more (about 80,000 of these reported gross sales of \$200,000 or more).

The problems of definition and classification continue to trouble researchers. Closely related to the question of what constitutes a family farm is the question of what constitutes a small farm. Various criteria have been used as classification guidelines, with gross sales and number of acres being the two most widely used. As reported by Carlin (1979:274), all farms with sales of less than \$20,000 are considered to be small farms, a definition "required by statute only in connection with certain research and extension programs authorized by the Rural Development Act of 1972, as amended." The United States Department of Agriculture recommended in 1981 that small farms be defined as those producing gross sales of \$5,000 to \$40,000 each (U.S. Department of Agriculture [USDA], 1981:144). However, as Wimberley (1983:327) points out, research on small farms is characterized by arbitrariness of conceptualizations; he reports that "small farms commonly are judged to be those with annual sales less than \$20,000 - \$40,000." Lack of conceptual agreement is seen in the definition used by Nikolitch (1969:530-545) who classified farms with less than \$5,000 sales as "part-time farms" and the USDA (1981) report which classified farms with less than \$5,000 as "rural farm residences."

Use of farm size (number of acres) as a criterion is no less problematical than gross sales. This becomes apparent when it is pointed out, for example, that a "50-acre wheat farm may be relatively small, whereas the same size for a poultry farm would be quite large" (Wimberley, 1983:327). Although agricultural census reports provide detailed information about farms according to size, this classification does not characterize farms as small, medium, or large. Rodefeld (1973:S10059), recognizing the limitations of single-variable criteria such as number of acres and gross farm sales, selected two variables for his classification scheme--land tenure and sources of labor. Even though Rodefeld's classification scheme is an improvement over single-variable classifications, however, it is viewed as inadequate because it ignores the dimension of size, that is, gross farm sales and acreage operated (Vogeler, 1982:27).

A third area of classification research focuses on the question of part-time farming, a subject that is of international interest, as demonstrated by the First Rural Geography Symposium held in Ontario in 1975 with representatives from England, Canada, the United States, Poland, Italy, Finland, and Sweden. Fuller (1976:53), in one of the papers presented, described part-time farming as "a multifaceted form of labor organization." Just as the concepts of family farm and small farm are multivariate constructs, so is the concept of part-time farm (Mage, 1976:11). Jenkins and Robison (1935:5) reported that the definition of part-time farm "varies somewhat according to the whims of the researcher and possibly the data at hand." Used as definitive criteria in many of the definitions found in the literature are days of off-farm work and sources of income. Le Ray (1965:38) identified three types of part-time farmers using a combination of days of off-farm work and value of agricultural products sold. Recognizing the restriction inherent in the use of off-farm work and value of farm products sold, Brewka (1982:7) adopted a definition combining farming activities with nonfarm or off-farm remunerative work done by farm operators and/or their spouses.

It should be apparent that definition and classification efforts by students of the American agricultural system have thus far not resulted in general agreement as to what constitutes a satisfactory typology. Perhaps it is the availability of so many different typologies that gives rise to the wish for some sort of generic typology which would reduce the complexities and diversities of a complex phenomenon to a generally coherent level (Doby, 1966:5). As synthesizing devices, typologies are simplifications of the concrete, and the purpose of all typologies is to identify and simplify (Goode, 1947:473-474). It is safe to say that classification is an order-imposing process; as such, any research that results in meaningful classifications--what Simon (1969:54) calls "sorting out"--of complex and diverse empirical observations contributes to knowledge and understanding. While many sub-types may be identified in an array of empirical observations, it is the general type which makes sub-types possible and gives meaning to each sub-type within a general typology (McKinney, 1954:152).

Problems of farm classification

Given the status of classification research focusing on agriculture, it seems appropriate to suggest that rural sociologists should devote more time to this basic aspect of science. Sociologists, in general, can be proud of a rich heritage in classification studies, beginning with Comte and including the work of Toennies, Durkheim, Weber, Cooley, and others. Rural sociologists have not been disinterested in classification research, but much of what they have contributed to this area has been on selected aspects of the agricultural system, not on farms and farm operators. For

example, the Cumulative Index of **Rural Sociology** covering volumes 31 - 40 lists 47 articles dealing with rural-urban differences and the concept of rurality, but less than half that number under the heading "Farmers, Farming in the U.S." There is evidence in more recent volumes of **Rural Sociology** of a renewed interest in agriculture (for example, see articles by Coughenour and Swanson, 1983; Dunlap and Martin, 1983; Harris and Gilbert, 1981; Heaton and Brown, 1982; Heffernan et al., 1981; Hoiberg and Bultena, 1981). The January 1984 edition of **The Rural Sociologist** contains three articles dealing with farms and farmers; the November 1983 edition contains none.

Researchers interested in general classification research focusing on agriculture face a difficult question: Is it possible, given the complex and diverse nature of agriculture in America, to construct a generic typology? If the answer is yes, then the researcher must ask: Where do I start? According to Simon (1969:54), classification research may be an end in itself, but "more frequently (it) is a step in some other type of research." Moreover, the sorting out of a collection of empirical observations may precede the construction of categories, or the process may be reversed. That is, the researcher may have in mind an appealing set of categories (appealing in the sense that his general knowledge of the data and of the literature suggest probable utility of a tentative classification scheme) that he wishes to test through careful examination of available data; or he may be dissatisfied with existing typologies and decide to begin his classification research with examination of data but without a set of categories in mind.

A logical beginning point for classification research focusing on agriculture is to inquire into its nature--what it is and what it does. It is the latter aspect of agriculture--its function--that appears to be the more relevant. Mottura and Pugliese (1980:175) identify two main functions of agriculture in a capitalistic social system; one is the production function and the other is the industrial reserve function. In this paper we view the production function as basic and as the most useful for generic classification purposes. To state this as its basic function is to imply a basic criterion for classification, knowing what is widely known about American farms; that is, not all farms produce the same amounts or the same products. Differences in production, both quantity and type, have been used extensively for classification purposes. While single variable bases for classification leave much to be desired, they have proven useful in some respects. A widely used classification scheme groups farms according to various size categories, including large-scale, medium-scale, and small-scale. These descriptive terms reflect, among other things, differences in contributions to the production of food and fiber needs of a society. In the capitalistic social system of the United States, the most appropriate indicator of the relative contributions of farms of different sizes appears to be the market value of products they sell. Ascertaining relative contributions of different size farms is not difficult; one simply refers to agricultural census reports

and finds which size farms account for various proportions of the total value of products sold.

In 1978 American farmers sold agricultural products with a total market value of slightly more than \$108 billion (slightly less than \$108 billion if abnormal farms are excluded). Table 1 shows the number of farms found in several sales categories established by the USDA along with their relative contributions (i.e., percent of total sales). Inspection of the data in Table 1 leaves no doubt that some farms are small and some are large in terms of their contributions to total sales. It is this variable that is widely used by researchers as a criterion for classifying farms into various size categories. Although our interest here is not in size per se, we do find the market value of farm products sold a useful criterion and begin by comparing three typologies found in the literature.

Comparison of typologies

The typologies we have selected for comparison are identified as Classifications I, II, and III, shown in Figure 1. Clearly depicted in Figure 1 is a lack of agreement concerning differentiation of farms according to market value of products sold (i.e., gross sales). This lack of agreement does not necessarily represent disutility of the classifications. For example, as mentioned previously, Carlin (1979:274) notes that the treatment of farms with less than \$20,000 gross sales as a single category of farms is required by statute "only in connection with certain research and extension programs authorized by the Rural Development Act of 1972." The \$5,000 to \$40,000 sales category (I.B in Figure 1) is based on the rationale that farms in this category are unique in the sense that "the combination of farm and nonfarm earnings is especially important" (USDA, 1981:144). Medium-scale farms (III.C in Figure 1) are described by Vogeler (1982:27-28) as having characteristics of both large-scale and small-scale farms, "becoming either larger or smaller and difficult to maintain in a polarized agriculture dominated by agribusiness."

Additional information about these classes of farms is found in Table 2. Some of the differences worth noting:

Class A farms in Classifications I and III represent slightly more than one-third of all farms in the United States, but they account for less than 2 percent of all sales, less than 18 percent of all land in farms, and less than 12 percent of the total value of farm resources (value of land, buildings, machinery, and equipment).

Class I.D farms and Classes II.C and III.D (identical) represent less than 10 percent of all U.S. farms. Respectively, however, they account for 47 and 66 percent of all sales, 22 and 38 percent of the total acres in farms, and 16 and 36

Table 1. Distribution of U.S. farms by sales categories
(excluding abnormal farms)

Sales Categories	Percent of all farms	Percent of total sales
Less than \$2,500	24.7	0.6
\$2,500 to \$4,999	13.4	1.1
\$5,000 to \$9,999	13.4	2.2
\$10,000 to \$19,000	12.5	4.1
\$20,000 to \$39,999	12.4	8.1
\$40,000 to \$99,999	14.7	21.4
\$100,000 to \$199,999	5.7	18.0
\$200,000 to \$499,999	2.5	17.0
\$500,000 or more	0.5	27.4
Total number of farms	2,476,340	
Total sales		\$107,868,700

Source: United States Department of Commerce, Bureau of the Census (1978).

Figure 1. Three classifications of U.S. farms

Classifications*

<u>Gross sales</u>	I	II	III
Under 5,000	Rural Farm Residence A	A	Part-time farms A
\$5,000 - \$9,999	B Small farms	Small-scale farms	B Small-farms
\$10,000 - \$19,999			
\$20,000 - \$39,999			C Medium farms
\$40,000 - \$99,999	C Medium farms	B Medium-scale farms	
\$100,000 - \$199,999			D Large farms
\$200,000 - \$499,999	D Large-scale farms	C Large-scale farms	
\$500,000 or more			

*Classification I is found in U.S. Department of Agriculture (1981).

Classification II is found in U.S. General Accounting Office (1978).

Classification III is found in Radoje Nikolitch (1969).

Table 2

Table 2. Selected characteristics of U.S. farms grouped according to three different classifications (figures are percentages)

Characteristics	Classifications											
	I			II			III					
	A	B	C	D	A	B	C	A	B	C	D	
All farms	38.1	38.2	20.4	2.3	76.3	14.7	8.1	38.1	25.9	27.1	8.9	
Total acres in farms	8.6	28.0	41.9	21.5	36.6	25.2	38.1	8.6	14.3	38.9	38.1	
Gross sales in farm products	1.7	14.4	39.4	44.4	16.1	21.4	62.4	1.7	6.3	29.5	62.4	
Full owners	77.6	56.3	31.4	30.9	67.0	32.9	28.8	77.6	62.0	38.2	28.8	
Individual or family farm	93.4	88.6	81.3	55.1	91.0	83.8	67.8	93.4	89.3	85.3	67.8	
Net cash income from farming	----	25.1	71.1	89.2	12.1	66.3	85.2	----	15.8	58.9	85.2	
Farm operators reporting 100 days or more off-farm work	64.8	51.0	11.9	9.7	54.1	14.6	13.4	64.8	36.0	20.0	13.4	

Legend I:
 A = Sales under \$5,000
 B = \$5,000 - \$39,000
 C = \$40,000 - \$199,999
 D = \$200,000 or more

Legend II:
 A = Sales under \$40,000
 B = \$40,000 - \$99,999
 C = \$100,000 or more

Legend III:
 A = Sales under \$5,000
 B = \$5,000 - \$19,999
 C = \$20,000 - \$99,999
 D = \$100,000 or more

*As a group, farms with sales of less than \$2,000 experienced net losses from farming.

Sollie and Frese: Mainline and Peripheral Agriculture: Toward Generic Classification of the total value of farm resources (value of land, buildings, machinery, and equipment).

It is apparent that the polar types depicted in Figure 1 are quite different in several respects. Further, the contributions of food and fiber of one group of farms are vital to the welfare of the nation, while the contributions of another group are relatively insignificant. Any nation with an agricultural surplus that loses nearly two-thirds of its agricultural production is in serious trouble, but the loss of less than 2 percent of its annual production would hardly be felt. It seems reasonable, therefore, to suggest that farms vital to the nation should be considered mainline farms and those with insignificant contributions should be thought of as peripheral farms.

A serious difficulty is encountered in efforts to construct typologies when the objects to be classified exist in continuous rather than in discrete form. Classification of farms according to some criteria is relatively simple; for example, a farm may be a cotton farm or a soybean farm or a combination of two or more such commodities. But classification of farms into two or more groups according to some measure of size (acres, sales, income) is largely arbitrary. We do not attempt to overcome this problem; instead, our purpose is to suggest a general typology that can be useful for description of social forms and identification of distinguishing attributes (Greer, 1969:134).

At this point, then, we have a typology consisting of two classes--large and small--or, as we suggest, Mainline and Peripheral. For our purposes we are classifying Mainline farms as those with reported annual sales of \$40,000 or more. Peripheral farms are those with sales of less than \$10,000 annually. This leaves us with a group of farms with reported sales \$10,000 - \$39,999, and we suggest that these farms be classified as Marginal farms.

Differences among the three classes

Having established the proposed generic typology consisting of three classes, we now call attention to some differences among these three classes of farms (see also Table 3 for other differences):

1. Market value of products sold by Mainline farms is about seven times (on the average) that sold by Marginal farms.
2. Market value of products sold by Marginal farms is about seven times that sold by Peripheral farms.
3. Peripheral farms are about one-third the size of Mainline farms.
4. Marginal farms are about one-third the size of Mainline farms.

Table 3. Selected characteristics of U.S. farms classified as Mainline, Marginal, and Peripheral (figures are percentages unless noted otherwise)

Characteristics	Mainline*	Marginal†	Peripheral‡
All farms	23.6	24.9	51.5
Total acres in farms average size (acres)	63.3 (1,052)	22.3 (353)	14.3 (109)
Gross sales of farm products	83.8	12.2	3.9
Average sales per farm	\$154,246	\$21,460	\$3,340
Total value of land, buildings, machinery, and equipment	61.3	21.0	17.7
Net cash income from farming	79.0	33.1	1.6
Full owners	31.3	50.6	74.9
Part owners	53.9	33.0	15.2
Tenants	14.8	16.4	9.9
Individual or family farm	78.6	87.9	93.0
Partnerships	15.7	10.9	6.6
Operators reporting 100 days or more of off farm work	14.4	39.2	62.4
Farms employing farm workers 150 days or more	57.8	18.0	7.7
Operators with farming as principal occupation	90.3	67.7	29.8

* Farms with gross sales of \$40,000 or more.

† Farms with gross sales of \$10,000 to \$39,999.

‡ Farms with gross sales of less than \$10,000.

5. Average value of land and buildings of Mainline farms is about three times that of Marginal farms.
6. Average value of land and buildings of Marginal farms is about two and one-half times that of Peripheral farms.
7. Average value of machinery and equipment of Mainline farms is about three times that of Marginal farms.
8. Average value of machinery and equipment of Marginal farms is about three times that of Peripheral farms.

The typical Mainline farm is large, consisting of more than 1,000 acres. It is a family farm, but the farm operator is more likely to operate his farm as a part-owner rather than as a full-owner or a tenant. Although his principal occupation is farming, it is not uncommon to find him involved from time to time in off-farm work. He provides work opportunities on the farm for about six nonfamily farm workers, but the majority of these workers are employed for less than 150 days per year. In this group, cash grain and/or livestock farms are the most common types. The Mainline farm operator depends largely on the sale of farm products for his net income. About one-fifth of his total net income is from off-farm sources.

The typical Marginal farm is about one-third the size of the Mainline farm, but is three times the size of the typical Peripheral farm. It is a family farm, and the operator is likely to operate as a full owner. His main occupation is farming, but about one-third of his peers claim something other than farming as their principal occupation. He is more likely than the Mainline, but less likely than the Peripheral, operator to be involved in off-farm work. Chances are small that he uses nonfamily farm workers. Only one-third of this net cash income is from farming.

The typical Peripheral farm is a small family farm that contributes a relatively insignificant amount of net income to the family; that is, less than 2 percent of the operator's net cash income is from farming. It is a full-ownership operation, but the operator's working days are spent off the farm. He might occasionally use nonfamily farm workers, and he is more likely to be involved in a livestock operation than in crops, dairy, or poultry, although this may vary by region.

Conclusion

This attempt to construct a generic typology of U.S. farms from published data must be viewed as a preliminary effort. The typology is not offered as the kind of finished product that might result from the use of more rigorous methodological procedures. Our purpose, however, was to examine the state of the art in classification research focusing on farms and to propose an alternative typology

based on the basic function of agriculture.

The state of the art in classification research focusing on farms indicates a need for more work. Many typologies are found in the literature, but the thread which ties many of them together is their arbitrariness. While several efforts have been made to overcome this problem, they have been less than satisfactory.

Although we do not avoid the problem of arbitrariness resulting from the use of a single variable criterion, we do contend that a generic typology must be based on the basic function of agriculture which is the production of food and fiber to meet the needs of a society. Further, if the basic function of agriculture is to produce food and fiber, it follows that any generic typology must reflect differences in contributions of various farms to the satisfaction of those needs. Still further, we contend that the market value of farm products sold is the most useful indicator of such contributions.

Use of this indicator as a criterion variable simplifies attempts to construct a typology, but it does not overcome the problem of class boundary determination. However, observation of data on market value of products sold shows that the contribution (sales) of some farms is so small that the loss of their production would hardly be noticed. With respect to societal needs for food and fiber, therefore, these farms can be viewed as nonessential production units; we suggest that these farms be classified as Peripheral, a term that is indicative of their role vis-à-vis the basic function of agriculture. Their numbers and resources, on the other hand, are not insignificant in terms of the structure of American agriculture; they account for slightly more than one-half of all American farms, close to one-fifth of agricultural resources, and slightly more than 14 percent of all farmland. These structural indicators, however, are only correlates of the relative contribution of Peripheral farms to the basic function of agriculture. These same indicators are correlates of contributions of Marginal and Mainline farms.

Any attempt to impose typological order on complex phenomena such as the American agricultural system is fraught with problems, and when it is recognized that some of society's goals vis-à-vis agriculture are not related to the production of food and fiber, the problem of classification is exacerbated. Raup (1972:9) has asserted that the ultimate societal concern about farm structure is a cultural variable, but we suggest that goals related to such societal values as distributive equity, viable rural communities, and other amenities are subordinate to the fundamental goal of producing sufficient amounts of food and fiber.

Among the questions that might be raised about our typology is one pertaining to its usefulness. To this question we would reply that the development of the typology is an attempt to clarify some of the issues associated with classification research focusing on agriculture. Specifically, we have attempted to deal with the question of generic classification of farms with the proposition that

the ultimate societal interest in farms must be their contribution to the food and fiber needs of society. The ultimate value of a farm to society, therefore, is its contribution to those needs, and on the basis of this proposition we contend that a typology whose categories reflect the relative contributions of groups of farms is useful. We would add, as one of our reviewers stated, that each of our "categories (Mainline, Marginal, and Peripheral) are, on average, orders of magnitude apart with respect to the scale variables (gross sales, assets, and size), thus justifying in part the title's reference to 'generic classifications'."

Second, our typology is parsimonious, a single-variable construct that requires no complicated statistical manipulations of data. Its simplicity facilitates its use. It is flexible in the sense that its class boundaries are not unmovable. For example, we suggest that loss of production by Peripheral farms would hardly be noticed since they account for only 3.9 percent of all sales; when we apply this criterion to Mississippi farms, however, we find that the class boundary must be shifted downward to include only those farms with sales of less than \$5,000.

We would also reply that the typology implies a "predictive schema" (McKinney, 1954:13). For instance, the concept of Peripheral farm implies an adaptation by the farm operator to social and economic forces beyond his control. That is, lacking resources necessary for adjusting food and fiber production processes to changing technologies and other forces, some farmers are forced to seek supplemental sources of sustenance. This sometimes results in a downward adjustment of farming operations.

Clouding the issue of classification in American agriculture is the fact that farmers more often than not produce food and fiber in excess of quantities needed. This fact of overproduction raises the specter of negative value to society of some of American's farms, but maintaining a viable food and fiber production system involves costs that society must be willing to bear. However, there remains a question of societal benefits versus costs of maintaining those farms whose contributions to food and fiber needs are insignificant. To recognize the central fact of their limited contribution leads to questions of policy formulation. Measured against their contributions to the food and fiber needs of society, Peripheral farms constitute a class for which policies designed to help them maintain their limited production pattern would seem to be irrational.

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