Agriculture Outlook Conference

United States Department of Agriculture
Washington, DC 20250-3900

Outlook '93 For Release: Thursday, December 3, 1992

CAN RURAL WORKERS COMPETE FOR THE JOBS OF THE FUTURE?

Elizabeth J. Greenberg, Paul L. Swaim, and Ruy A. Teixeira
Economic Research Service

Introduction

In an era of intensified global competition and rapidly changing technologies, workers with "world class" skills will have the best chance of enjoying high wages and job security. Historically, the rural workforce has been less educated than their urban counterparts and rural areas were especially hard hit by economic restructuring during the 1980's. This coincidence suggests that many rural workers may not have enough of the right skills to compete for the jobs of the future.

The purpose of this paper is to assess the educational and skill levels of rural workers. We look first at educational attainment in rural areas, then at educational achievement (i.e., how much rural students learn while in school), and finally at the job training received by rural workers after they leave school. Our analysis highlights several important shortcomings of rural education and training, but also surprising strengths. We conclude with a brief discussion of the policy implications of our analysis.

Educational Attainment

The most widely used measure of educational level is the highest grade completed, commonly referred to as educational attainment. 1990 Census data indicate that nonmetropolitan (nonmetro) adults have somewhat lower educational attainment levels than their metropolitan (metro) counterparts (Table 1). In contrast to earlier historical periods, however, the metro and nonmetro distributions are quite similar. In both areas, a typical worker has a high school diploma but not a bachelor's degree. This broad middle of the education distribution comprises 55 percent of the metro workforce and a nearly identical 56 percent of the nonmetro labor force.

A rural gap in educational attainment is evident, however, both at the top and at the bottom of the distribution. In 1990, 31 percent of the nonmetro population age 25 and older had not finished high school compared to 23 percent of the metro population. A rural gap in educational attainment is also evident at the top end of the distribution. Forty-eight percent of metro adults attended at least some college, 23 percent earned a bachelor's degree, and 8 percent a professional or graduate degree. The corresponding nonmetro

shares were significantly lower at 35, 13, and 5 percent.

The negative association between educational attainment and rurality is even more evident when a more detailed classification of nonmetro areas is adopted (Figure 1). The share of adults not graduating from high school rises from 27 percent in nonmetro counties with urban populations of at least 20 thousand to 34 percent in totally rural counties, while the share earning at least a bachelor's degree falls from 16 to 11 percent. But, the association of low educational attainment with rurality is neither simple nor uniform. Regional differences, for example, are pronounced, with much of the nonmetro gap in high school completion due to pockets of very low education in the rural South. Furthermore, the most urban areas in America (i.e., central counties in the largest metropolitan areas) also contain a high proportion of high school dropouts. Unlike rural counties with high dropout rates, however, these "inner-city" counties also contain large numbers of persons completing four or more years of college.

Historically, educational attainment in rural areas has lagged that in urban areas, but the long-term trend has been for the gap to close and this convergence continues to be evident when high school completion rates are calculated for younger cohorts: between 1971 and 1991, the nonmetro gap in high school graduation was halved (Table 2). In a break with earlier trends, however, the rural-urban gap in completing a bachelor's or more advanced degree increased after 1971. The share of the metro population, ages 25-44, with at least four years of college increased by 10.8 percentage points between 1971 and 1991, while the nonmetro increase was a smaller 5.4 points. This divergence exaggerates rural-urban differences in school continuation, because it reflects, at least in part, an intensified rural brain-drain: rural youth attending college increasingly migrated to urban areas where the economic returns to their education were higher.

These rural-urban comparisons of educational attainment indicate some grounds for concern, but do not suggest that employers considering locating or expanding in rural areas will be deterred by generally low educational levels. Nonetheless, high school dropout rates remain too high in many rural areas, especially in the South. These attainment data also suggest that rural youth planning to remain in their home community may be discouraged from obtaining a college education.

Educational Achievement

The data in the previous section suggest that the educational attainment levels of average rural workers are less of a problem than generally supposed. However, it could be objected that the attainment levels of these rural workers are not the issue, achievement levels are. In other words, the typical rural student may now be staying in school and getting a diploma, but he or she may be learning much less than his or her urban counterpart. By this logic, the current abundance (by historical standards) of rural high school graduates could be deceptive: these graduates may not know enough to be good workers. A related quality concern is that rural high schools may not adequately prepare their best students for the most challenging colleges and

universities. Thus, the quality of the rural education could still be a severe problem despite the obvious upgrading in terms of years of schooling.

Fortunately, a data set does exist that allows this argument to be evaluated directly. This is the National Assessment of Educational Progress (NAEP), a continuing national probability survey of the cognitive achievement levels of U.S. students. The NAEP tests up to 100,000 students a year, distributed so that 4,000-6,500 students are tested in a given subject at each of three grade levels. By obtaining metro/nonmetro and, in some cases, county identifiers for individual cases on the NAEP data files, we were able to assess the cognitive achievement levels of rural students and their relation to urban student achievement levels.

The specific results we present are from the 1988 and 1990 NAEP surveys and cover a diversity of subject areas. We could only perform metro/nonmetro comparisons for the 1988 data on reading, history, civics, geography and writing. We had county identifiers for the 1990 data on math and science, however, that allowed us to use more detailed urban-rural categories.

Table 3 shows the average achievement scores of metro and nonmetro 12th graders, for reading, history, civics, geography, writing, and detailed science and math subject areas. The data in the table are quite clear: average levels of achievement in these subjects vary by only trivial amounts across metro and nonmetro areas. Indeed, while the pattern of results does suggest a very slight metro advantage, the only statistically significant differences between the two areas are in reading and two subfields of math (algebra and functions, and measurement), and these differences are all less than 5 points on a scale that ranges theoretically from zero to 500. (Over 90 percent of 12th graders actually score between 225 and 375, still a large range.) And, there is even one subject (writing) where nonmetro students score a little higher than their urban counterparts. These data hardly suggest that rural children are being shortchanged in what they learn in school.

Further disaggregation of the 1988 data into census regions (Table 4) confirms the general pattern of only small differences between metro and nonmetro average achievement levels. Besides this general pattern, two other findings deserve note here. The first is that the region where nonmetro 12th graders have the worst relative performance is the South. Even here, differences are not large (no more than 9 points in any one subject), but it does suggest that if a case is to be made about a general rural achievement deficit, it should be confined to rural areas in the South.

The second is that in the Northeastern and Midwestern states nonmetro students generally score higher than metro students. This is particularly noticeable for nonmetro science students in the Midwest, whose average science score is a statistically significant 12 points higher than metro science students. This illustrates just how far off it is to assume that a rural high school diploma is necessarily worth "less" than an urban diploma. In some areas, the rural high school diploma may even be the superior credential.

Table 5 provides further geographic detail on science and math achievement. The breakdown here is by modified Beale code region, and provides an ordinal classification of counties going from least rural (central counties of metro areas of population one million or more) to most rural (completely rural counties). These data show that the slight metro achievement advantage shown in Table 3 is driven by the relatively low scores in the two most rural nonmetro categories (nonmetro counties with urban populations of less than 20,000 and completely rural counties). The third nonmetro category (nonmetro counties with urban populations of 20,000 or more) actually had average scores higher (with one exception) than all metro categories. And, even the two low achievement nonmetro categories trail the highest achievement metro category (fringe counties of metro areas of population one million or more) by only 13-15 points. Again, these differences suggest no profound achievement disadvantage for rural students.

While average metro and nonmetro achievement levels are similar, it could still be argued that metro students are more likely to reach advanced levels and that, therefore, the equality of averages across metro and nonmetro areas masks serious differences in educational quality for the best students. Table 6 addresses this issue by displaying the percentages of students in each area preforming at levels which roughly correspond to "medium" and "advanced" (typically 300 and 350 points, respectively). The percentages in Table 6 should only be compared within a subject area (i.e., horizontally), because the NAEP scores are not designed to be comparable across subject areas. For example, the fact that fewer students score "medium" in reading and writing than in the other subjects may not indicate that student achievement is lower in these subjects.

Though metro students again appear to have a slight advantage, these data do not suggest large differences in the percentage of students in metro and nonmetro areas obtaining medium to advanced scores. In terms of attaining the medium level of achievement, the largest differences are around 5 percentage points and only the difference in reading levels is statistically significant. The percentage point differences in the share of students at the advanced level of achievement are also small, with the largest difference only about 3 percentage points. However, because even in metro areas only 3-10 percent received advanced scores, these relatively small nonmetro gaps are large in a proportional sense and probably indicate lesser opportunity for rural students to receive a superior secondary education.

The data in Table 7 compare the access of metro and nonmetro students to advanced courses and confirm important differences in opportunities to train for further achievement beyond the standard high school curriculum. Most striking is the poor access of rural students to advanced academic courses. For example, only 23 percent of rural students attended a school where A.P. American history was offered, compared to 57 percent of urban students. The other rural/urban differences on A.P. access are also large and statistically significant. The rural disadvantage is also large for calculus and advanced science classes.

Another interesting finding is that fewer than half of all rural students (47

percent) are enrolled in an academic/college preparation program, compared to 60 percent of urban students (Table 8). Overall, the data suggest that, while most rural students may not be being shortchanged by the education received in high school, the brightest students may have less opportunity to pursue more elite levels of education than their urban counterparts. This, in turn, would suggest that, if higher college graduation rates in rural areas are deemed desirable, the focus should be less on the content of the basic education rural students receive--apparently adequate, at least in relative terms--and more on programmatic opportunities to pursue elite levels of education.

Vocational Training

Job skills are not limited to the academic skills emphasized in school. A bachelor's or professional degree is the key qualification for the minority of workers in certain professional, technical, and managerial occupations. For the rest of the workforce, however, post-school vocational training, such as formal company training programs and informal on-the-job instruction, is a more frequent source of job qualifications. A comprehensive assessment of the workforce preparation system in rural areas must therefore encompass post-school vocational training.

Do rural workers have adequate training opportunities after joining the labor force? Data for 1991 suggest that rural workers do not have as many opportunities to improve their job skills as urban workers (Table 9). The rural training deficit is fairly small (40 percent of nonmetro as compared to 43 percent of metro workers had received training on their current job), but it is worrisome that this gap in training rates openned up between 1983 and 1991. Although some U.S. employers appear to have concluded that their long-run competitivity requires increased investment in workforce training, this trend was much stronger in urban areas.

A second concern is that enterprise-based training is least available to the rural workers in greatest need of improved vocational skills. Workers with low levels of formal education also receive much less post-school training and may become trapped in low-skill jobs. The overall rural gap in job training may, thus, be closely related to the lower educational attainment of the rural workforce. Training rates are also low for racial and ethnic minorities. Only about one in four rural Blacks and Hispanics report any training on their job as compared to over 41 percent of other (predominantly White) rural workers. Finally, training rates are quite low in the rural South, where educational attainment is lowest and most nonmetro Blacks and Hispanics live.

The training provided to rural workers also differs in several respects from that provided to urban workers (Table 10). One difference is that nonmetro workers receive less training in managerial and computer skills than metro workers. A second is that nonmetro workers are less likely to participate in formal company training programs. This is probably due, at least in part, to the smaller size of rural firms. Most small firms can not afford to establish formal training programs and must instead rely on either informal instruction from co-workers or external training providers. Among external providers, nonmetro firms differ from metropolitan employers by relying more on private

vocational schools and less on four-year colleges. Unfortunately, many rural firms are not located near any public or private schools that can provide specialized vocational training for their workforce.

Conclusions

It appears that the broad middle of the rural workforce is receiving a solid education--at least in relative terms.[1] The quality of these workers should provide no special deterrent to rural development. It follows that education's potential as a rural development strategy, by itself, is probably quite limited. Nonetheless, our analysis highlights several weaknesses in rural education and job training that should be addressed as part of broader strategies to revitalize the rural economy. Our analysis also reveals important regional differences with educational and training deficiencies apparently most severe in the South.

The relatively large proportion of high school dropouts in some --particularly southern-- rural areas is a cause for concern. Fortunately, it would appear that, if larger proportions of rural youth can be convinced to stay in school, they should receive an education comparable to that available in urban areas. Thus, dropout prevention should be an efficacious way to improve the skill credentials of that portion of the rural workforce.

Perhaps the most widespread problem with rural schooling lies in the need to increase opportunities for students to pursue advanced education. Our results strongly suggest that rural students are being shortchanged on this score, despite the relatively good quality of the basic education those in high school are receiving. Moving forward on this front may therefore be the key to closing the rural-urban gap in college graduation rates. If job opportunities for workers with advanced degrees continue to be scarce in rural areas, however, many rural youths graduating from college will probably continue to move to the Nations' cities.

A final concern is that post-school job training programs do not appear to reach many rural workers who lack a college degree. Limited training opportunities for noncollege educated workers is a national problem, but is more severe in rural areas, probably due to the lower educational attainment of the rural workforce (together with the tendency for enterprise-based training to focus on professional and other highly educated workers), the typically smaller size of rural employers, and more limited access to two-year colleges and other external sources of vocational training. As the nation moves to upgrade vocational training for the "bottom-half" of the workforce, the full participation of rural workers needs to be ensured.

---

[1] It is possible that educational achievement needs to be upgraded across the board to boost U.S. competitiveness. But this is a national concern, equally applicable to rural and urban areas. For more discussion of this point, see Teixeira and Swaim (1991), Mishel and Teixeira (1991) and Teixeira and Mishel (1992).

References

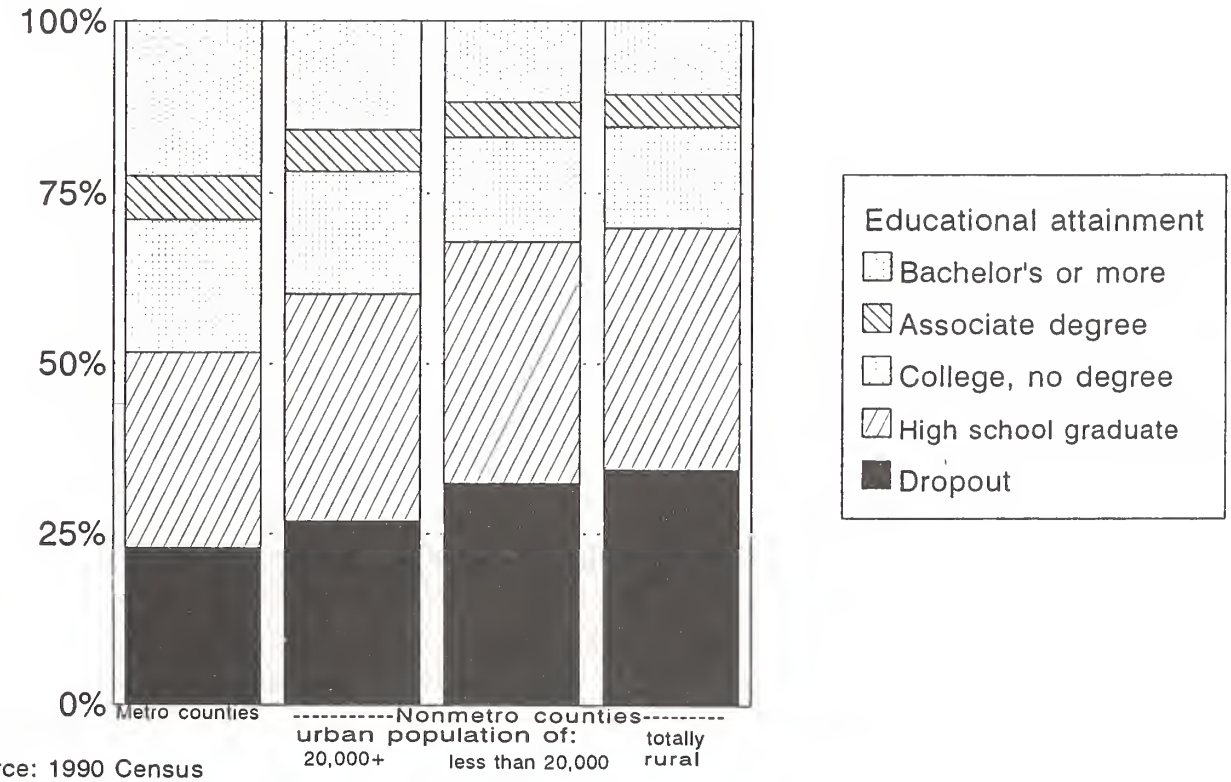
Mishel, Lawrence and Ruy Teixeira, **The Myth of the Coming Labor Shortage: Jobs, Skills, and Incomes of America's Workforce 2000**, Washington, D.C.: Economic Policy Institute, 1991.

Teixeira, Ruy and Lawrence Mishel, **The Myth of the Coming Labor Shortage in Rural Areas**, Washington, D.C.: Economic Policy Institute, 1992.

Teixeira, Ruy and Paul Swaim, "Skill Supply and Demand in the New Economy: Issues for Rural Areas," Chapter 2 in **Education and Rural Economic Development: Strategies for the 1990's**, Washington, DC: Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture, ERS Staff Report No. AGES 9153, 1991.

Figure 1. Educational Attainment by Area, 1990

Adults ages 25 and older



Source: 1990 Census

Table 1 - Educational Attainment of Persons Aged 25 and Older, 1990

Schooling Completed	Metro	Nonmetro
	percent	
Graduate or professional degree	8.0	4.5
Bachelor's degree	14.5	8.5
Associate degree	6.4	5.4
Some college, no degree	19.5	16.1
High school graduate	28.6	34.7
High school dropout	23.0	30.8

Source: 1990 Census.

Table 2 - Educational Attainment of 25-44 Year-Olds, Selected Years

Item	1971	1975	1979	1983	1987[1]	1991
Completed high school:			Percent			
Metro	73.7	79.6	83.2	85.7	87.1	87.7
Nonmetro	65.6	70.7	77.8	80.8	82.7	83.7
			Percentage points			
Nonmetro gap	8.1	8.9	5.4	4.9	4.4	4.0
Completed 4 or more years of college:			Percent			
Metro	17.0	21.4	24.0	26.8	27.5	27.8
Nonmetro	10.8	13.8	17.5	18.0	16.2	16.2
			Percentage points			
Nonmetro gap	6.2	6.6	6.5	8.8	11.3	11.6

[1] The metro/nonmetro classification of counties was revised between 1983 and 1987 using 1980 Census data.

Source: Current Population Survey

Table 3 - Mean Achievement Scores of 12th Graders

Subject	Metro	Nonmetro
Reading*	288.0	284.1
History	295.7	292.8
Civics	296.6	296.0
Geography	293.5	291.2
Writing	223.9	224.8
Science Composite	293.7	292.4
Life Sciences	295.8	295.4
Physical Sciences	291.2	289.0
Earth and Space	291.8	290.6
Nature of Science	298.6	296.9
Math Composite	296.3	293.1
Algebra and Functions*	298.0	293.6
Geometry	297.5	293.0
Measurement*	295.3	291.6
Numbers and Operations	295.0	292.4
Data Analysis and Statistics	295.3	295.0
Estimation	293.1	293.7

*Metro-nonmetro difference is significant at the 95 percent level of confidence.

Source: 1988 and 1990 National Assessment of Educational Progress.

Table 4 - Mean Achievement Scores of 12th Graders, by Region

	Northeast		Midwest		South		West	
Subject	Metro	Non-metro	Metro	Non-metro	Metro	Non-metro	Metro	Non-metro
Reading	286.9	289.8	289.5	286.7	287.8	279.7*	288.2	286.7
History	297.0	298.6	298.0	297.6	290.6	287.7	295.7	292.6
Civics	293.9	297.2	298.5	304.8*	294.0	286.8*	299.4	299.5
Geography	293.4	306.1*	298.1	298.8	284.5	280.9	295.7	292.2
Writing	231.8	222.8	221.0	230.4	215.9	218.9	223.2	228.1
Science Composite	298.5	303.7	291.6	303.5*	281.7	275.8	297.3	293.9
Math Composite	301.0	303.9	296.9	299.4	287.8	279.3*	296.3	296.3

*Metro-nonmetro difference is significant at the 95 percent level of confidence.

Source: 1988 and 1990 National Assessment of Educational Progress.

Table 5 - Mean Math and Science Scores by Detailed Rural/Urban Categories

County Type	Math	Science
Metro areas:		
Central counties of metro areas of population 1 million or more	292.9	289.7
Fringe counties of metro areas of population 1 million or more	302.0	299.1
Counties in metro areas with populations of 250,000 - 1 million	297.3	295.4
Counties in metro areas with a populations less than 250,000	291.9	289.8
Nonmetro areas:		
Nonmetro counties with urban populations of 20,000 or more	299.9	303.3
Nonmetro counties with urban populations of less than 20,000	289.5	286.1
Nonmetro counties with no urban population (totally rural)	287.3	286.3

Source: 1990 National Assessment of Educational Progress.

Table 6 - Percent of 12th-Graders Performing at "Medium" and "Advanced" Levels

	Medium Score or Better		Advanced Score or Better	
Subject	Metro	Nonmetro	Metro	Nonmetro
Reading	38.3	33.5*	2.7	1.4*
History	47.2	41.8	5.1	3.0
Civics	49.0	49.1	6.0	6.2
Geography	46.3	42.4	5.3	3.7
Writing	29.9	30.2	6.5	5.8
Science Composite	45.0	43.6	9.7	6.9
Math Composite	47.1	42.3	5.2	3.6

*Metro-nonmetro difference is significant at the 95 percent level of confidence.

Source: 1988 and 1990 National Assessment of Educational Progress.

Table 7 - Availability of Advanced Curricula to 12th-graders

School offers:	Metro	Nonmetro
	percent of students	
Advanced placement course in:		
American government*	21.8	6.6
American history*	57.3	23.1
English language*	54.1	29.5
English literature*	59.9	24.6
Calculus*	89.9	47.8
Second-year biology*	74.9	68.8
Second-year chemistry*	61.7	45.7
Second-year physics*	31.8	7.7
Computers used as part of instruction	44.7	45.9

*Metro-nonmetro difference is significant at the 95 percent level of confidence.

Source: 1988 and 1990 National Assessment of Educational Progress.

Table 8 - Distribution of 12th Graders by Academic Track and College Enrollment

Item	Metro	Nonmetro
	percent of students	
Enrolled in:		
Academic/college preparation program*	59.6	47.2
General education program*	28.7	31.1
Vocational/technical program*	15.1	22.5
Will go to a vocational/2-year college	28.5	32.6
Will go to a 4-year college*	52.9	43.5

*Metro-nonmetro difference is significant at the 95 percent level of confidence.

Source: 1988 and 1990 National Assessment of Educational Progress.

Table 9 - Skill-Improvement Training on Current Job, 1983 and 1991

Group of workers	Metro		Nonmetro	
	1983	1991	1983	1991
	------percent receiving training------			
All workers	36.8	43.4	36.8	39.9
Gender:				
Men	37.6	43.1	37.2	39.3
Women	35.9	43.7	36.3	40.6
Race/Ethnicity:				
Hispanic	23.2	29.5	24.1	27.3
Black (nonhispanic)	30.7	37.4	27.8	27.1
White (nonhispanic)	38.7	45.9	37.8	41.4
Education:				
Dropout	17.1	19.3	19.0	18.2
High school graduate	31.0	35.8	33.3	34.7
1-3 years college	42.2	47.8	44.5	49.0
4 years college	51.1	57.9	55.3	65.3
5+ years college	60.5	67.8	68.4	72.8
Region:				
Northeast	31.9	40.0	38.6	42.6
Midwest	37.6	44.8	36.7	42.1
South	37.6	44.8	34.0	36.3
West	40.6	43.2	41.7	44.0

Source: January 1983 and 1991 Current Population Surveys.

Table 10 - Types and Sources of Skill-Improvement Training for Workers Receiving Training on their Current Job, 1991

Training Type/Provider	Metro	Nonmetro
Type of training:	---percent----	
Managerial	27.9	23.7
Computer	34.7	29.3
Academic (Three R's)	14.5	14.6
Other technical	62.9	66.4
Training provider:		
School	32.0	33.3
Company program (formal)	42.5	37.1
On-the-job (informal)	39.7	39.4
If school:		
High school vocational educ.	4.4	4.0
Private vocational school	9.7	13.3
Two-year college	41.0	41.5
Four-year college	50.5	46.8

Source: January 1991 Current Population Survey.