

## *Do We Need College Graduates in Agriculture?<sup>1</sup>*

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Although there is little doubt that highly educated workers earn higher wages in the modern sector, the question of whether education raises farm productivity remains a contentious one. Recent evidence indicates that years of education have risen across many countries, including India, Indonesia, Thailand, and the Philippines [Asian Development Bank (ADB), 2008].

Furthermore, the greater availability of more qualified workers relative to new jobs appropriate to their level of education may in turn have led to the employment of overqualified people in comparatively low-skilled jobs. One recent study concludes that, human capital, particularly

of the highly skilled kind, is not a critical constraint to growth (ADB, 2007). As applied to agriculture, we may ask: Does a college degree have any value? Or is a high school diploma enough?

Higher education in agriculture is conceptually crucial for two main reasons. First, it improves “allocative” efficiency, in the sense that more educated individuals can utilize inputs more effectively across seasons and across several products. Second, education enhances the use of these inputs so that more inputs are used to produce more outputs.

It is then hypothesized that higher education is significant in agriculture

if technological change is to be done. Otherwise, there is no leverage for higher education as many farmers, including those with less education, become more familiar with and gain more access to the process of production.

Analyzing household data collected in Camarines Sur, Bicol Region, in 1978 and 1994, validates this hypothesis. These data are significant as they represent two different situations.

The first survey captures the dynamic context in which technology innovation, such as the Green Revolution, was being introduced. The second survey dealt with a stable situation, where technology is generally stationary, while rice varieties are continuously being developed. The focus was more on stabilizing yields and improving quality.

Moreover, innovations have not been extensively output-creating but geared toward equity and distribution, specifically making these more accessible in the rainfed areas and to household members with less schooling.

Empirical analysis shows that high returns of education were experienced at the time the new technology was being introduced, implying that

those who reached college were more capable of allocating and managing resources across seasons, which then resulted in higher production and income.

The role of college graduates is deemed crucial in disseminating the benefits of modern technology: each additional college graduate returns on average a 22% increase in value added for each farm household.

However, once the end-users became conversant with the new technology, productivity of high school graduates increased dramatically; the additional return from college education fell to just 13%.

Consistent with Schultz's (1975) argument, this result implies that higher education is crucial when agriculture is adjusting due to an innovation. Likewise, this confirms recent findings on the role of human capital in facilitating technological change (e.g., Benhabib and Spiegel, 1994). In periods when innovation is stagnant, education has been observed to increase non-farm productivity. In this case, college graduates are likely to engage in non-farm work or in production processes where technical changes are felt.

The foregoing results are based on panel data from one province and are therefore subject to further validation. Nevertheless, a few implications can be drawn.

First, the results highlight the importance of human capital in the determination of productivity, especially if this is viewed fundamentally as interacting with technology. Its formation could indeed lead to an increase in the observed total factor productivity. What is crucial, however, is sustaining the development of modern technology in agriculture.

The value of human capital seems to change, depending on the technological environment in the community. Adopting better technology on a more permanent basis is a sure way of enhancing the returns from human capital and ultimately facilitating growth.

The noted low productivity in the country's agricultural sector, in particular, is also an indication that human capital investments need to be improved to cater primarily to the needs of the technologies as they are developed. The introduction of new technology, however, also needs to

be complemented with a new breed of human resources. Considering the lull in technology innovation, the current state of education seems to be more suitable to non-farm, presumably overseas, work. The adoption of new technology and its ultimate diffusion depend fundamentally on higher education and its complementarity with other levels of education.

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