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WOMEN'S PRODUCTIVITY IN AGRICULTURAL SYSTEMS: AN OVERVIEW

Kathleen Cloud and Catherine Overholt[1]

Look at me! Look at my arm!...I have plowed, and planted, and gathered into barns, and no man could head me - and ain't I a woman? I could work as much as any man... - and ain't I a woman?
--Sojourner Truth: Akron, Ohio, 1852

Women's Productivity: The Neglected Dimension

Increasing agricultural productivity is an essential goal of development. In recent decades there has been a growing recognition that women as well as men are productively engaged in agricultural systems. Knowledge of the factors affecting both women's and men's productivity is required for policymakers. Planners must therefore recognize that development strategies may result in differential gender effects. Agricultural productivity may be constrained or enhanced by the interaction between policy and the gender division of labour and control over productive resources.

The purpose of this paper is twofold: to identify the literature relevant to understanding women's productivity in agricultural systems, and to propose a coherent framework for examining women's productive activities. Such an initial effort, by its very nature, must be exploratory rather than definitive. Our purpose is to begin to clarify issues and identify linkages which will promote more precise analyses in the future.

At present there is very little in the literature directly concerned with the issue of women's productivity in agricultural systems, and the work that has been done is fragmented analytically. Social scientists and "women in development" scholars have expanded the knowledge of women's roles in rural societies and have generated theories to account for systematic shifts in men's and women's productive activities as agricultural technology has changed. However, their work has focussed on documenting and analyzing women's roles and participation rather than women's productivity. The economic literature has dealt with women's productivity in limited terms: the human capital literature discusses women's productivity in terms of the quality and quantity of their children; household production models consider women's productivity in supplying household goods and services; and farming systems and farm management literature make assumptions regarding women's productivity in agricultural labour. Each effort is partial and does not systematically deal with women's productivity across the full range of their activities in agricultural systems.

Without a systematic framework, it is difficult to perceive relationships among productive activities and to establish an underlying rationality for women's productive behaviour. Conceptual work that would allow more coherent analyses has not been undertaken until recently. The economic theory of the family farm firm combined with the current work on human capital development and household economics hold considerable potential as a useful framework. Such a framework places women's productivity squarely within the household decisionmaking context. It allows us to compare the time allocation pattern for all household members, to assess the effects of exogenous changes on this allocation, and to think systematically about the opportunity costs of time as well as its relative productivity in distinct uses.

The household context presents a departure from many feminist analyses. That literature has insisted on viewing women as separate decisionmaking units. Women are, however, linked to production and consumption relationships through implicit bargaining arrangements within agricultural households more than in other production systems. We must therefore begin to analyze women's

productivity within the context of the household and within an expanded definition of production to include what women produce, and to emphasize the importance of gender related analyses.

The household, as we use the term here, refers to a unit whose boundaries are permeable and change both over time and under different macroeconomic conditions. The unit is assumed to be a kinship based group with corporate ownership of some resources and a degree of joint decisionmaking among members. Such a definition includes monogamous, polygamous, and women headed households as well as extended families. We expand the definition of production to include the goods and services produced by women within the agricultural household. Five basic categories of production taken together embrace the goods and services produced within a farm household: (1) nonwage agricultural production refers to output of crop and livestock intended for home consumption or market sale; (2) household production encompasses goods and services produced within the household for home consumption or market sale; (3) human capital production refers to childbearing, transmission of skills and knowledge, and labour force maintenance; (4) self-employment in the informal market sector includes off-farm production activities such as marketing and personal services; and (5) wage labour refers to paid employment.

The first section of this paper is devoted to a selective survey of literature which directly or implicitly considers questions of productivity among rural women. The subsequent section discusses the elements of a framework for examining women's productivity in terms of the agricultural household. Our concluding remarks briefly indicate the relationship between farm household resource allocation and the national economy.

Factors Influencing Women's Participation and Productivity

The gender division of labour on U.S. and European farms has been the subject of very little empirical work until quite recently, while comprehensive work on factors influencing women's participation in productive tasks is available for societies in early stages of agricultural development. U.S. economists have assumed a western based gender role division of for agricultural activities in developing countries, but this assumption seems to be an increasingly serious oversimplification. Empirical work on the division of labour across traditional societies has clarified male and female roles and contributions to a variety of farm household tasks. Proximity of tasks within a production sequence and task safety are more likely to determine gender division of labour than differential strength.

The empirical base identifying factors which affect gender related productivity is partial, fragmentary, and tends to emphasize gender differences, yet much can be learned from this literature. Physical factors associated with size, strength, and reproduction overlap with sociocultural and institutional factors as well as family incentive structures. These factors in combination affect women's productivity.

Women's relatively smaller size and strength are often cited as reasons for assuming their lower productivity in farm labour and off-farm employment. In farming systems research, there is a tradition of weighting a woman's productivity at 0.75 or 0.8 of a man's. Empirical analysis of input-output data in Africa and Sri Lanka does not support these weights. In Bangladesh, by contrast, women's productivity was lower than men's when carrying earth and rocks for road building. Productivity differences based on size and strength vary by task, and may be greatest for tasks that demand most body mass and strength in the upper torso (Deere). Although it is difficult to measure work by different family members, more rigorous data collection and analysis to establish realistic weight ranges for tasks are recommended as necessary for accurate economic analysis (Norman).

Women produce new human capital through childbearing. After childbirth, women continue to carry out much of their productive work while attending to the needs of their children. This stream of joint productive work is characteristic of many women in farm households, particularly when they are pregnant and nursing. Joint productivity is not easily handled by standard economic procedures, and presents a problem for economists similar to that facing agronomists in assessing productivity for intercropping systems. Methodological work on the value of children is establishing inroads in this area. Vanzo and Lee provide useful insights into the compatibility of child care with other productive work and on the opportunity costs of household members' time.

The dependency ratio and the structure of the household influence women's productivity by their effects on the selection of productive activities. Infants and young children demand a great deal of time, but older children can substitute for a mother in a number of tasks, and expand the family labour force. The presence of other adult women in the household within polygamous or extended family structures also influences the pattern of women's productive activities.

Structural or institutional factors may contribute to gender differences in productivity as agricultural systems are modernized. Boserup made the classic feminist argument linking participation and productivity. Although gender differences in productivity might be expected to narrow as agriculture becomes less dependent on human muscular power, she observed that men monopolize the use of new equipment and modern methods. Men's labour productivity tends to rise while women's remains static. She concluded that the tendency toward a widening productivity gap is often exacerbated by cash crop cultivation among men, while women produce food crops for the family without cash income for improving their farming techniques.

Boserup drew heavily on African experience, and her arguments did not explicitly extend to modernized agricultural systems. During the 1970s, numerous studies were carried out attempting to confirm or reject her arguments. Some results demonstrate that women with responsibility for particular crops or with management responsibilities for entire household production systems often lack access to modern iputs through exclusion from farmers' associations or cooperatives, and through lack of access to capital, credit, or government extension servies (Staudt; and Loose). Moock, however, found women farm managers in Kenya equally productive per hectare in spite of the fact that they had less capital and used fewer purchased inputs. The irony of the Kenyan situation is that women often have less ability to command communal labour and fewer resources to pay for it. Women command their own labour and that of the child labour force they create. In many instances, they can only command the labour of female children while male child labour may be claimed by their husbands.

In farming systems where women are not independently responsible for particular crops but participate as unpaid labour in family farming, their lack of access to capital constrains their investment in productivity enhancing household technologies such as stoves, mills, water tanks, and kerosene, as well as their human capital investments in nutrition and health care. Certainly agricultural households make joint allocative decisions, but women's relative power in decisionmaking varies.

Little attention has been paid to the question of providing adequate incentives for women's increased productivity. The incentive structure influences women's productivity through choice of activity and access to productivity enhancing inputs (Burfisher and Horenstein). Payment for work done by women is often made to their husbands, or only men are paid for crops produced by the joint labour of all family members. Women's lack of access to cash assets, which results from their status as unpaid workers, is compounded by constraints on their access to off-farm labour markets (Binswanger and Rosenzweig).

A final factor influencing women's productivity is the extent to which they have access to education and training. There is general agreement that education increases productivity, and a substantial literature exists on the positive effects of women's education on human capital development, household production, paid labour force participation, and agricultural production.

A Household Framework for Examining Women's Productivity

Women's total productivity needs to be considered within the context of the household decisionmaking unit, and not in isolation from its relationship to the broader socioeconomic environment. Examining women's productivity requires a systematic approach and a coherent framework. The agricultural household production models in the economic literature (Barnum and Squire; Rosenzweig; Huffman and Lange; and Evenson) provide a starting point for such a framework.

Economists have devoted increased attention to the household as a decision-making unit and to the extent to which rational choice among alternatives explains household behaviour. The household production literature regards farm production as a process by which market or household inputs are combined with the time of family members to produce commodities which directly enter a household utility function. The models integrate the decisionmaking process with respect to both production and consumption and specifically take into account the value of labour time.

These models require four refinements in order to be useful and appropriate for examining questions related to women's productivity: an expansion and refinement of the definition of productive activities so that women's productive activities are included; a specification of gender differences in labour inputs for the production function; a reassessment of the family utility function; and an estimation of full agricultural household income.

Most of the household models use comprehensive definitions of total farm output that go beyond conventional outputs of farm crops and livestock. None utilizes a concept of output that would include all the farm outputs which are the products of work usually done by women. We propose that the inclusive defintion of total farm household output outlined at the beginning of this paper be used.

There are several problems associated with the measurement of production. One problem concerns the difficulty of defining or differentiating between work and leisure activities. Do we consider time a mother spends playing with her child as an economic output because she is developing human capital, or is it leisure because she does it strictly for the pleasure it brings her? Joint production inherent in the five basic categories of production also presents a measurement problem. Weaving cloth and teaching a small child can be carried out at the same time. Only one of these activities would tend to be observed, but in fact there are two products. A final measurement problem concerns valuation of the output.

Most household production models make no differentiation in the production function between male and female labour inputs. They therefore have an implicit assumption that labour inputs are perfectly substitutable. Male and female labour inputs should be included separately in the production function, and further differentiation of labour inputs by household and farm task may be required.

A central concept used by the household production model is its assumption that the farm household acts as a small firm which maximizes a household utility function. Alternative models of household behaviour exist which may be more appropriate. Nevertheless, the neoclassical household production model, even though western oriented in its formulation, has inherent analytical appeal and can prove quite useful when applied appropriately. However, the underlying assumptions of the utility function require particular attention. The theoretical

model assumes the existence of a household utility function, consensus among family members as to its form, and agreement among family members as to how to allocate their individual and shared resources so as to maximize family utility. While economics has little to say with respect to the manner in which families derive their utility function, how households actually formulate it is critical. Instititutional features of the household utility function may range from shared decisionmaking to collusive or otherwise exploitative relationships. The underlying assumptions of the household function and their relationship to women's productivity and suboptimal allocations of resources are only beginning to be examined in the economic literature (Jones).

The household production model requires a concept of an income or budgetary constraint. Household income should therefore include the value of all the productive activities carried out by individual farm household members. A concept of "full income" is emerging from the income distribution and household production literature which recognizes the economic value of traditionally unremunerated work (Kusnic and Vanzo; and Quizon and Evenson).

Considerable uncertainty is associated with the estimation and valuation of full income. Suggested approaches include market alternative prices of the opportunity cost of time for less well defined household services, but they have several shortcomings. An unresolved problem concerns the treatment of time spent in involuntary unemployment. In the presence of substantial unemployment, women are acknowledged to suffer differentially from involuntary unemployment (Rosenzweig).

The issue of double counting also persists as an unresolved problem for estimating full income or total production. Because the agricultural household is both a production and a consumption unit, it is simultaneously both a demander of inputs and a supplier of outputs. Household and human capital production provide inputs for household agricultural output while at the same time the farm output provides inputs for household and human capital production. A concept of net value added is required.

The perception that women's productive activities are systematically related to the national economic environment has led to examination of ways macro level changes are related to shifts in patterns of women's labour allocation. Changes in cropping patterns and agricultural technologies have been shown to affect supply or demand for women's labour during certain periods of the production cycle, or to displace them from available land. Demographic changes have altered labour allocation and patterns of agricultural production.

Macro policies produce gender related shifts in resource allocation patterns through both forward and backward linkages. At the heart of the matter are tradeoffs as resources are allocated within the context of a household. The household decisionmaking unit must be the focal point of the analysis. An understanding of the implicit bargaining processes which underlie household resource allocations relates directly to the issues of women's productivity and policy issues concerned with production.

The household production model which incorporates the value of human time has proved to be a useful concept for understanding household allocation of resources and the relationship between the household and the economy. These concepts are pivotal for understanding women's productive activities. The attempt here has been to describe the theoretical underpinnings of a model and to suggest modifications which would render it appropriate. The primary concern is to develop a sound statistical basis for a realistic assessment of both women's and men's contributions to national economies, and to permit formulation of policies which could increase their economic contribution.

Note

[1]Harvard Business School, Harvard University, Boston.

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