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# *WID Information*

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## RESEARCH NOTES

### **Technological Change in Agriculture and the Welfare of Women in Southern Mali**

by Nina Lilja

Some studies have reported that under current institutional arrangements in developing countries, the impact of technological change is highly inequitable. In particular, it is argued that labor-using technologies introduced in Africa require women to work more without additional compensation. Little evidence has been available on what determines women's compensation for work on family owned fields. This study reports results from fieldwork in five Malian villages on payments to women including both money and in-kind receipts. The study considers

the impacts of new technologies, household decision-making structure, and the opportunity cost of women's time in determining these payments, thereby testing several household behavioral models found in the literature.

In Mali, as in other Sahelian countries, most resources and revenues of the farm household are managed by the male head of the household. Household members work on the communal lands and are allocated private plots for their own income earning and for additional food consumption objectives. Prior to the introduction of commercial cotton production and other cash activities, the farming system focused on subsistence production of sorghum, millet, rice and vegetables, and the household members were paid a grain allowance as compensation for their work on the communal land. New income streams and substantial increases in the demand for labor on the communal lands arose with the introduction of cash crops such as cotton and maize.

The empirical evidence shows that women have benefitted very little from the increased cotton production in terms of increased income. Although the majority of women's labor effort is directed to communal production, women receive very low compensation, both in terms of money and in-kind payments, for their work on the communal field. Even after including an estimate for the subsistence allowance (which is paid to all the members of the

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household with an understanding that communal labor contribution is expected in return) the gains from increased cotton production remain low.

The expansion of cotton cultivation increases women's communal income, but the magnitude of the gain is very small. Net gains from expansion of cotton cultivation are negative for those women who also cultivate their own private plots when the demand for labor in the communal field reduces the amount available in private plots. This implies that the expansion of cotton production makes women worse off in terms of net income gain if they are required to reallocate their labor from private production to communal production.

The head of the household retains the major share of the communal profits. After subtracting the cost of agricultural inputs, taxes and household subsistence needs, the head of the household retains half of the net profits from the communal production and distributes the remaining half to the adult members of the family in terms of subsistence grain, money, goods and labor services. On average, in a household of nine adults, each man receives eight percent and each woman receives four percent of the total net communal profits in payment for their respective labor contributions on the communal field. Conflict and dissatisfaction among the household members over the distribution of the gains from new agricultural technologies appears to be leading to institutional changes in family structure and labor participation. In southern Mali, the pressure to divide the productive assets of the household is increasing as younger men pressure the household head to break up the traditional system of communal production.

The second institutional change is the voluntary reorganization of the traditional workteams. Participation in an agricultural workteam apparently increases members' collective bargaining power and enables the participants to capture larger gains from increased communal incomes than if they were acting as single agents contracting their labor to the head of their respective individual households. There are several other ways in which women's welfare could be improved.

Private plots are clearly the most important source of income to women. In the areas where the soils are very depleted and the private land is constrained, some gains from technological change can be achieved by increasing the communal field participation at the expense of the small reduction in private field income. However, in the areas where the land is more abundant, the gain from technological change in terms of increased communal wages does not generally exceed the losses in private returns due to reallocation of labor from private to communal fields. Furthermore, even when the women in land constrained areas are compensated more for their communal work than women in the land abundant areas, their total incomes are well below the total incomes of the women in the land abundant regions.

For many years, the Women in Development literature has emphasized the importance of private fields as a source of income and nutritional supplements. Since the ownership of the private field seems to be part of the compensation for the communal work, this provides an additional reason for improving the productivity of private fields in order to increase women's income. Women do not own the private land and only have temporary user right to the land they cultivate. The implicit rent for the private field is paid in terms of the "obligatory" production of vegetables for the household consumption. Establishing landrights to women's private fields would free women from these "obligatory" production constraints and allow expansion of production to more profitable crops.

Due to the population pressure on land, the extensification of private fields is not a viable recommendation in most regions. At the present, women in southern Mali are using very low levels of purchased inputs such as fertilizer, herbicide and pesticide on their private fields. Women frequently complained about the lack of cash needed to buy fertilizer or herbicide. Because the household head controls all the productive assets of the household by custom, he is in the sole position in the household to purchase inputs from the cotton parastatal through credit. If the head of the household is not willing to act as an intermediary in order to allow women to

purchase inputs on credit, it is nearly impossible for them to obtain inputs from other commercial agents who are generally unwilling to extend credit. Women in Development literature has advocated providing women access to credit but the problem of actual implementation of successful credit schemes remains a difficult problem in Africa. Men's strength and efficiency in access to inputs lies in their collective actions through village association. Promoting and supporting women's group to organize themselves in a similar fashion would allow women to obtain similar benefits of collective action in order to gain access to credit.

Yet there is another possible obstacle to improving women's access to credit, namely their ability to repay the credit. The fact that most of the private plot production is home consumed poses a problem for repayment of credit. This problem is possible to overcome if the purchased inputs increase output sufficiently above the home-consumption levels. The crops commonly grown on the private field include rice and vegetables and if marketed, are channeled through local markets. The prices for vegetables are not controlled, and with the recent price liberalization programs the price of rice is no longer controlled by the government. This means that women's crops are much riskier than cotton, even though often associated with high returns. Nevertheless, in attempts to increase the productivity of private plots and the income of women, the possible adverse effects of price volatility cannot be ignored.

Another recommendation for improving women's productivity as farmers includes the improvement of health of the women. The health risks associated with working in stagnant waters with rice production are substantial. Schistosomiasis and dracunculosis are still common causes of illness and result in a loss of available labor days.

The empirical results imply that increasing female bargaining power within the household in terms of changing their perception about their right to refuse to work on the communal field increases their communal wages. However, only fifteen percent of the women currently reported possessing this

perception about their right to refuse to work on the communal field if they were not satisfied with the compensation they received for their work. The improvement of women's bargaining power would influence the women's threat point and possibly secure a more favorable outcome in the wage negotiations. However, the improvement of women's perceived bargaining power is very complicated issue to implement. How a person perceives his or her contribution to the welfare of the household as well as the self-interest perception of the individual will influence the solution to the family bargaining problem in addition to individual's threat point. If a lower value is attached to a person's contribution to the welfare of the household, it will weaken that person's ability to secure a favorable position in the collusive solution. The means to improve women's bargaining power includes social reforms such as improving women's access to education.

Another recommendation implied by this study is to increase women's opportunity cost outside the family farm. Women gain indirectly from technological change through the growth of off-farm income earning opportunities in southern Mali. The development of agricultural services, such as organized cotton harvesting teams, is one such instance of a new income opportunity arising from technological change. Many forms of petty commerce have also developed as cash incomes have increased. The income effects of opportunity costs on communal wages are small but the statistical results show that women's income is positively influenced by new economic opportunities.

*Copies of this study can be requested from: Mary Rice, Dept of Agric. Econ., Purdue University, 1145 Krannert Building, West Lafayette, IN 47907-1145, e-mail: rice@agecon.purdue.edu*

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## WID ANNOUNCEMENTS AT UIUC

### Students Completing Gender Roles in International Development Concentration 1997.

**Donna Fisher** - Department of Agricultural  
Economics - Masters

**Grace Malindi** - Human and Community  
Development - Doctorate

**Dora Mwalwenje** - Vocational and Technical  
Education - Masters

**Aida Orgocka** - Human and Community  
Development - Masters

**Joseph Otieno** - Department of Geography -  
Doctorate

**Rosintan Panjaitan** - Agricultural Communications  
- Doctorate

### WID Paper Competition

The Office of Women in International Development (WID) announces its Fifteenth Annual Student Paper Competition with two awards of \$100.00 to each winning graduate and undergraduate paper. Papers from all disciplines will be accepted. Papers should be typewritten, double spaced and prepared in a journal format acceptable to the student's major discipline. Papers should not exceed 30 pages in length. Please indicate graduate or undergraduate and include Summer telephone contact or address. **Deadline: Monday, May 19, 1997.** Winners will be announced September 1997. Submit papers to: WID Office, 320 International Studies Building, 910 South Fifth St., Champaign, IL 61820. For more information contact: Aida Orgocka (244-1722) or Kathy Martin (333-1994).

## JOB OPPORTUNITIES

**International Maize and Wheat Improvement Center (CIMMYT)** announces the position of an **Economist for Latin America** for a period of three

years. **Duties** will include research on economics of agricultural technology flows in the region. Technologies to be analyzed: germplasm, crop management technology and natural resource management technology. Patterns of transfer will be documented and rates of return to research programs will be calculated with and without counting for spillover, in order to assess the economic importance of these transfers. **Requirements:** A degree in Agricultural Economics or Economics and three years of post-doctoral experience is required. Recent Ph.D. may be considered in exceptional cases. Fluency in spoken and written Spanish. Experience with the economics of agricultural research, knowledge of agricultural science, and experience database management. Evidence of research collaboration and facilitation skills. **Location:** CIMMYT's headquarters just outside of Mexico City. **Deadline: May 31, 1997.** Send letter of application (refer to code GP), recent curriculum vitae and contact information of three references to: Ms. Krista Baldini, Human Resources Manager, CIMMYT, Lisboa 27, Apdo. Postal 6-641, Mexico, D.F. 06600 Mexico; Phone: (525) 726-9091; Fax: (525) 726-7558; E-mail: rh@cimmyt.mx

## ANNOUNCEMENTS

### One Year Later: 4<sup>th</sup> UN Women's Conference

**Peace Petition from Women of the World to Governments of the World:** *We, the women of the world, are horrified at the levels of violence witnessed during this century and that women and children are the primary victims of war and poverty. On behalf of society at large, we demand that annually, for the next five years, at least five per cent of national military expenditures be diverted to health, education and employment program. By doing so, one half billion dollars a day would be released worldwide for programs to improve living standards. We also demand that war, slavery, colonialism and apartheid, be outlawed as totally unacceptable forms of social behavior, and that*

*governments and civil society together develop new institutions that do not resort to violence for the settlement of disputes. Together, we commit ourselves, as half of the world's population, to use our power to ensure that these demands, which will promote international peace and security, are met through legislation and action. We resolve that we inaugurate a new century that rejects warfare and promotes human welfare"*

This petition is being circulated worldwide, and will be presented at the United Nations General Assembly in September, 1997. By February 1997 60 organizational co-sponsors representing every region in the world had signed the petition. Signatures will be collected until August 30, 1997. Please mail, e-mail or fax your signatures as you collect them to: CCIA/WCC, Room 9-D, 777 United Nations Plaza, NY, NY 10017, USA or Fax to CCIA/WCC (1-212) 867-7462 or International Peace Bureau (1-212) 750-5849 or e-mail to: <wccia@igc.apc.org> or <paintl@igc.apc.org> or <iwtc@igc.apc.org> Those replying by e-mail put the word "Petition" in the SUBJECT space at the top of the page. A simple sentence stating that you are signing the Peace Petition would also be helpful. Source: International Women's Tribune Center.

## STUDY & TRAINING OPPORTUNITIES

**The International Agriculture Center (IAC)** Wageningen, The Netherlands announces a fourth international course on **Gender Policy Development for Sustainable Land Use** to be held October 6 to October 19, 1997. The course is intended for men and women policy makers of both government and non-government organizations in developing countries as well as donor agencies. Candidates should be engaged in agricultural or environmental policy development and actively be involved in related gender issues.

The course is aimed at strengthening the ability of the participants to develop policies that

warrant an appropriate balance between sustainable land use and gender issues and to enhance the motivation to take these issues at heart. The course provides participants with information, view points and tools that will help them conceptualize, plan and formulate policies on sustainable land use from the perspective of gender.

Another course on **Strategic Environmental Assessment: A Framework for Sustainable Land Use Planning** will be offered November 2-15, 1997. The objectives of the course are to provide participants with critical insights and practical experience with respect to analyzing and designing solutions to environmental problems by using the *Problem-in-Context and Strategic Environmental Analysis* frameworks.

The Center is also offering a course on **Environmental Economics: Tools for Policy Analysis in Rural Development** January 4-17, 1998. The course is aimed at familiarizing participants with the methodologies for integrating environmental economics into the design and implementation of rural development policies and programs; providing participants with skills to incorporate environmental impact into economic analyses for rural development; and providing knowledge of the design and application of environmental policy tools, the past experiences with these tools, and the relevance of the tools in rural development.

For more information on these and other courses contact: The Director, IAC, P.O. Box, 6700 AB Wageningen, The Netherlands. Fax: (31)317-418552; E-mail: iac@iac.agro.nl

**International Peace Academy (IPA)** announces an its internship program called "**Program Interns**" and "**Development Interns**" in New York. **Program interns** assist IPA staff in research, planning and coordination of training seminars, conferences and forum activities. Interns may also assist in organizational and administrative tasks. Requirements: Graduate and undergraduate students in international relations, political science, international law, international organization, area



studies, languages, history, or economics. On going research include conflict resolution in Africa; peacekeeping and conflict resolution in Eastern Europe and former Soviet Union; and multi-year project on "Peace building, Legacies and Strategies" which covers Haiti, Cambodia, Somalia, El Salvador, and Bosnia.

**Development interns** assist IPA development staff in fund-raising and public outreach, including publication of the recently launched IPA Newsletter. Work is research-oriented and provides the intern with exposure to the key skills of fund-raising in the international context. Requirements: graduate and undergraduate students in business management, politics or international relations. **Deadline application for Fall 1997 cycle is August 1, 1997.** For more information contact: Martin Faigel, Training, International Peace Academy, 777 United Nations Plaza, New York, NY 10017-3521. Tel. (212) 687-4520. Fax: (212) 983-8246. E-mail: faigel@ipapost.ipacademy.org

## FELLOWSHIPS, GRANTS AND AWARDS

**The Center for East Asian and Pacific Studies (CEAPS)** announces a faculty exchange program for research up to 10 months at one of these universities in China: Peking University, Nanjing University, and Northwest University (X'ian) in China. The Chinese Universities will provide room, a monthly stipend, health care at the university clinic. The Center for East Asian and Pacific studies will provide round-trip coach airfare. Faculty exchange program with Taiwan Universities Consortium Exchange offers research opportunities for three to six months. Faculty may use one of the universities as a base, but it is not a necessary condition of support. The member universities are The National Central University near Taipei, National Sun Yat-sen University in Kaohsiung, and Tamkang University in Tamsui/Taipei. **Deadline for Spring 1998 requests is October 1, 1997.** For more information contact:

Roberta Gumport, Assistant Director, CEAPS, Tel. (217) 244-4601.

## CONFERENCES

**Business and Professional Women's Foundation (BPW)** announces an academic symposium on "The Duality of Work and Family Roles" to be held July 16, 1997 at Galt House Hotel, Louisville, Kentucky. The conference will focus on current research on the combination of childcare and/or elder care responsibilities with challenges of employment. For hotel reservations contact: The Galt House Hotel, Fourth Avenue at the River, Louisville, KY 40202, Tel. 1-800-626-1814 or 502-589-3300. Fax: 502-585-4266. For more information contact: BPW Symposium, Meetings Department, 2012 Massachusetts Ave., NW, Washington, DC 20036. Tel. (202) 293-1100. Fax: (202) 861-0298.

**The Institute for Research on Women (IROW)**, State University of New York at Albany announces one-day conference on **Gender Research in Global Perspective June 4, 1997.** The Conference will feature the following speakers: Cheryl Johnson-Odim from Loyola University in Chicago; Asuncion Lavrin from Arizona State University; Nalova Lyonga from University of Buea, Cameroon; Kornelia Medrjanska from Sofia University, Bulgaria; and Anastasia Posadskaya-Vandrbeck from Rutgers University and Moscow Center for Gender Studies. For more information contact: Ms. Deborah White, Research Associate, IROW, SS-341, University at Albany, Albany, NY 12222. Tel. (518) 442-3311; Fax: (518) 442-4936. E-mail: dw8223@cnsibm.albany.edu

## RESOURCES

*Beyond Credit: A subsector approach to promoting women's enterprises* is a video and book edited by Martha Alter Chen. The package introduces a new

and effective approach to promoting women's enterprises and provides guidelines for understating and applying this approach. Using case studies from Bangladesh, India, Nigeria, Ghana, Chile, the Philippines and Canada, the book illustrates how participatory subsector approach can be used in different settings. The video shows how the approach is used by Bangladesh Rural Advancement Committee and the Self Employed Women's Association in India. Book and video price: \$34.95, plus \$8.50 shipping and handling (airmail) or \$4.50 shipping and handling surface mail. To order book and video, send payment to Aga Khan Foundation Canada, 350 Albert Street, Suite 1820, Ottawa, Canada K1R 1A4. Tel. (613) 237-2532. To order book only (\$19.95, plus shipping and handling charges) contact: Women Ink., 777 United Nations Plaza, New York 10017. Tel. (212) 661-2704. Fax: (212) 661-2704.

*Gender, Communities, and Natural Resource Management: A Conceptualization Workshop* report edited by Elena Bastidas. The book reports on how training activities on gender and natural resources have been utilized to promote the incorporation of community participation and gender relations in natural resource management. For more information contact: Merge, 304 Grinter Hall, University of Florida, Gainesville, FL 32611. Tel. (352) 392-6548. Fax: (352) 392-0085. E-mail: [merge@tcd.ufl.edu](mailto:merge@tcd.ufl.edu) <http://www.tcd.ufl.edu/merge>

**The Intern-American Working Group on Youth Development** was created in 1996 by a group of multilateral and international development organizations interested in promoting a more effective response to the needs of the region's young people. The working group has solicited input on effective strategies and program development ideas from young people and the organizations that work with them. The results of a survey from 23 countries will soon be ready. For more information please contact: Fabian Koss, Inter-American Development Bank, 1300 New York Avenue, N.W. Washington,

DC 20577, USA. Tel. (202) 623-3097; Fax: (202) 623-1420 or e-mail: [fabiank@iadb.org](mailto:fabiank@iadb.org)

*A Citizen's guide to Gender and the World Bank* (1996). A source book for gender advocates on how to get involved in the World Bank's decision-making and operations in order to hold the Bank accountable to its gender commitments. Available at US\$10.00 from: The Bank Information Center, 2025 Eye Street, NW., Suite 400, Washington, DC 20006 USA. Tel. (202) 466-8191; Fax: (202) 466-8189. E-mail: [bicusa@igc.apc.org](mailto:bicusa@igc.apc.org)

The following resources are available from **Women Ink**, 777 United Nations Plaza, New York, NY 10017, USA. Tel. (212) 687-8633. Fax: (212) 661-2704. E-mail: [wink@igc.apc.org](mailto:wink@igc.apc.org)

*World Education Report 1995* by UNESCO. Third edition of biennial series addressing trends and policy issues in education. Focuses on education for women and girls. It analyzes the formal education in both industrial and developing countries, focusing in particular on male-female disparities; gaps in key indicators: literacy rates; enrollment ratios; years of schooling; school retention; and fields of study. The report also examines girls' experience of the educational process itself and its effects on adult life chances, and reviews various remedial measures being taken in different countries. Price US\$19.95

*A Commitment to the World's Women: Perspectives on a Development Agenda for Beijing and Beyond* (1995) edited by Noeleen Heyzer. What is the specific development agenda that women world wide have been calling for over the past 20 years of organizing, activism, and the UN world conferences? In this anthology, over 15 authors present a multiplicity of visions of a women's development agenda for the major global issues of our time: economic restructuring, sustainable livelihoods, healthy communities, and governance and decision-making. Price US\$14.95

For more information on these and other materials contact Women Ink at the address above.

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UNDELIVERABLE AS ADDRESSED-  
FORWARDING ORDER EXPIRED

~~Naama A. Bassan  
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