



International Food and Agribusiness Management Review
Volume 15 Special Issue A

Linking Agricultural Research with the Agribusiness Community from a Pro-Poor Perspective: the Importance of Human Capital Development

Global Networks, Global Perspectives and Global Talent
Discussions on the Development of Human Capital in Agribusiness¹

Laura Donnet[Ⓐ] Jon Hellin[Ⓑ] and Jens Riis-Jacobsen[Ⓒ]

[Ⓐ]Associate Scientist, Socio-economics Program, International Maize and Wheat Improvement Center (CIMMYT),
Apdo. Postal 6-641, 06600 Mexico, D.F., Mexico

[Ⓑ]Senior Scientist, Socio-economics Program, International Maize and Wheat Improvement Center (CIMMYT),
Apdo. Postal 6-641, 06600 Mexico, D.F., Mexico

[Ⓒ]Director of Information and Communication Technologies, International Maize and Wheat Improvement Center
(CIMMYT), Apdo. Postal 6-641, 06600 Mexico, D.F., Mexico

Abstract

Improved crop varieties are a key output of agricultural research and have contributed to significant increases in agricultural production and productivity. However, the benefits from advances in plant breeding have often not reached the majority of poor farmers. This essay tackles the challenge of enhancing human capital development in the International Maize and Wheat Improvement Center (CIMMYT) in order to enhance impact on food security and poverty reduction. Key changes in strategic planning, leadership, organizational alignment, talent and performance culture along with the need for new ways of thinking and action are outlined.

Keywords: non-profit organization, agricultural research, innovation, MasAgro.

[Ⓐ]Corresponding author: Tel: + 52.55.5804.2004 (ext. 2129)
Email: L. Donnet: l.donnet@cgiar.org
J.Hellin: j.hellin@cgiar.org
J. Riis-Jacobsen: j.riis@cgiar.org

¹ This Special Issue was made possible through the generous support of Alltech and Kincannon & Reed. The essay collection was distributed during a special session on human capital development presented during the IFAMA 2012 Forum in Shanghai, China on June 14, 2012.

Introduction

An estimated 70 percent increase in world agricultural production will be needed to meet food demands by 2050. Improved crop varieties are a key output of agricultural research and have contributed to significant increases in agricultural production and productivity (Evenson and Gollin 2003). Scientific crop breeding will continue to play a critical role in meeting the challenge of increasing food production. However, the benefits from advances in plant breeding have often not reached the majority of poor farmers cultivating marginal lands. Enhancing the productivity and profitability in these marginal areas will require approaches that promote the translation of innovations in plant science into concrete benefits for poor farmers.

This essay tackles the challenge of enhancing human capital development in the International Maize and Wheat Improvement Center (CIMMYT) in order to enhance impact. CIMMYT is an international non-profit research and training organization headquartered in Mexico. CIMMYT's mission is "*To sustainably increase the productivity of maize and wheat systems to ensure global food security and reduce poverty.*" CIMMYT applies the best science to develop and freely share the following: high-yielding, stress tolerant maize and wheat varieties; large, unique collections of maize and wheat genetic resources; productivity-enhancing and resource-conserving farming practices; and training and information related to the above. A key imperative to human capital development within CIMMYT is to make it a more effective player in the global agricultural community and to enable it to steer a steady course among the community's multiple stakeholders.

Drivers and Challenges for a Non-profit Agricultural Research Organization

Crop breeding in CIMMYT has rightly focused on finding solutions to the key constraints to crop production, many of which center around abiotic and biotic stresses (Delmer 2005). In the past the impact of an organization like CIMMYT was partly determined by the number of improved crop varieties generated while far less attention was given to whether this germplasm was adopted by farmers and the impact of this adoption. CIMMYT, like many other non-profit, multiple stakeholder research organizations, now faces the challenge of demonstrating impact in farmers' fields. A number of factors have come together that have both encouraged and supported CIMMYT's reinvigorated focus on food security and poverty reduction:

- Increased food price spikes, and their detrimental impact on the poor, has focused CIMMYT's managers on the urgency of moving beyond the assumption that an increased in agricultural productivity will lead to poverty reduction; greater attention is being given to impact pathways and the required conditions for linking poor farmers and micro and small enterprises to markets and agrifood chains from a pro-poor perspective (Danse and Vellema 2007).
- Change in donors' demands and criteria for funding and evaluation has led to an increase in funding for agricultural research that goes beyond crop breeding activities and which includes complementary disciplinary research that facilitates technology uptake, e.g., social science along with capacity building of agricultural researchers and partner organizations. This is encouraging agricultural research organizations to employ scientists that represent a broader range of disciplinary backgrounds.
- The paradigm shift from an industrial to a knowledge society means that the primary source of wealth is human capital. The challenge for senior management in agricultural research organizations is to ensure there is sufficient human capital to convert data into meaningful information. From an agrifood value chain perspective, meaningful information needs to be created and shared by a broader range of private and public sector value chain actors, i.e., socially embedded innovation (Danse and Vellema 2007).

A refocus is needed for CIMMYT to meet the unique opportunity of delivering technology solutions to increase food security and overcome poverty. A key component of this adjustment is a far greater emphasis on human capital development. This essay focuses on CIMMYT's role in a large Mexican government agricultural initiative called *Sustainable Modernization of Traditional Agriculture* (MasAgro) to illustrate how CIMMYT is meeting this new challenge.

Sustainable Modernization of Traditional Agriculture (MasAgro)

MasAgro is a network of value chain actors that includes farmers, research and development organizations, private seed companies and extension agents. MasAgro aims to increase maize and wheat productivity by enhancing farmers' access to appropriate technologies, including improved seed. Mexico is the center of maize diversity and maize is central to the livelihoods of millions of producers. However, maize productivity and producers' incomes, particularly in rain-fed areas, remain very low, and there is limited use of improved maize varieties.

A major bottleneck to farmers benefiting from improved maize seed is the development of a strong seed sector that is responsive to farmers' needs and demands. A paradigm shift is required whereby farmers are seen as creative entrepreneurs who value new technological opportunities and who constitute a potential market for innovative and more sustainable technologies, an idea that is elaborated by the Base of the Pyramid (BoP) approach (Prahalad 2010; London and Hart 2004). Research organizations and firms must be able to manage a variety of business models, market strategies and modes of chain coordination to offer the flexibility needed in markets which include poor farmers (Wiersinga et al. 2011) in a way that values their resources and capabilities for healthy and sustainable food production.

A Strategy Centered on Human Capital Development

CIMMYT's coordinating role within MasAgro requires that it acts as a network broker (Hellin 2012), a catalyzing agent who fosters the emergence of an agricultural innovation system in Mexico. CIMMYT is facilitating the establishment of linkages, multi-stakeholder interaction and capacity building amongst different actors in the innovation system². In order to play an effective network brokering role, human development changes are required within CIMMYT; changes that provide an institutional environment encompassing both the 'traditional' technology-generation research approach with one that places more emphasis on outcomes and impacts (See Exhibit).

The shift from a traditional technology-generation focus to an organization that maintains this scientific excellence, while simultaneously encompassing a greater emphasis on outcomes and impacts, will take time. Some existing staff may no longer have the skill sets to meet future challenges and may need to be replaced. Recruitment of new staff to cope with fast growth is time-consuming and even more so when it comes after several lean years when CIMMYT downsized. Furthermore, upgrading of support service partnerships are needed to complement internal capability, such services include information and communication technologies. Senior management has not specified the timeframe for the required institutional changes, but three years is a realistic vision. In the meantime, MasAgro is a strong incentive and opportunity for CIMMYT to become a more effective player in the global agricultural community.

Conclusions

For CIMMYT to be a leader in poverty reduction and food security, a big change is necessary along the lines of broader networking with the agribusiness community, total innovation in seed product and, in general, technological package solutions and full tracking of impact. To achieve such high lev-

² An innovation system can be defined as a network of organizations and individuals that are focused on bringing new products (e.g., improved maize seed), new processes, and new forms of organization into social and economic use. The institutions and policies that affect their behavior and performance is also part of the innovation system. An innovation system consists of a web of dynamic interactions among researchers, seed firms, extension agents, farmers, traders, and processors (Hall et al. 2005). Innovation systems depend on learning processes, feedback loops, and iterative interactions that are decidedly non-linear (Spielman et al. 2008).

els of innovativeness, CIMMYT must first convert its culture into a more participative and more respective one. There is a strategic role for senior management and human resource professionals to be the change leaders. MasAgro, epitomizes the opportunity (and challenge) faced by CIMMYT in meeting pressing food security needs. The Mexican government has large expectations from the network brokering role that CIMMYT is playing in MasAgro. There now exists an opportunity for CIMMYT and its staff to manifest their commitment to poverty reduction through new ways of thinking and action.

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	Traditional Technology Generation Focus	Greater Outcome and Impact Focus	Key Human Capital Management Changes Allowing for Combination of Columns 2 and 3
Strategic Planning	Harnessing scientific expertise to develop improved maize & wheat varieties	<ul style="list-style-type: none"> • Focus on innovation and collaboration • Cascading strategic priorities • Enhance solutions delivery 	<ul style="list-style-type: none"> • Present Projects systematically and to display synergies • Improve job quality and working environment
Leadership		<ul style="list-style-type: none"> • Value and treat people as primary assets • Value openness, diversity and creativity 	<ul style="list-style-type: none"> • Foster employee creativity (seeking input and participation in planning) • Foster engagement with successful results • Increasing efforts in communication of organizational culture to current and potential employees, partners and stakeholders (videos, web, etc.)
Organizational Alignment	<ul style="list-style-type: none"> • Vertical and centered in genetics and crop breeding disciplines. • Research and subsequent development of improved germoplasm 	<ul style="list-style-type: none"> • Horizontal, incentive-compatible, and cross-disciplinary. • Interaction with socioeconomics and business and supply chain management for developing integrated solutions including the design and implementation of joint ventures with private seed companies 	CIMMYT is implementing changes in evaluation and promotion. These changes may, for example, place less importance on the number of peer-reviewed journal articles and more importance on the impact of the staff's work through training courses for national partners from the public and private sector.
Talent	Technical	Human, management, leadership	New staff is being recruited with different skill sets including monitoring and evaluation, systems-thinking and broader natural and social science backgrounds. Existing staff is being offered training on project management. Training in leadership, building effective teams and facilitation skills will be needed.
Performance Culture		Performance focused culture: clear and agreed performance standards	Introduction of electronic work plans and evaluation system that will develop indicator and metrics for judging the success of individuals, projects, program and the institution in ensuring impact.

Exhibit. Human capital development in CIMMYT that allows for continued generation of agricultural technologies along with greater focus on impact.