

Background and Context

The CGIAR Research program on maize (CRP MAIZE) led by CIMMYT, represents a collaborative effort between the two CGIAR Centers engaged in maize research (CIMMYT and IITA) and brings together the research activities of the two Centers along with approximately 350 public and private sector partners worldwide.

Initiated in 2011, the aim of CRP MAIZE is to implement a new strategy for international maize research, designed to ensure that publicly-funded international agricultural research contributes to stabilization of maize prices and doubling productivity of maize-based farming systems, and making them more resilient and sustainable. It aims to significantly increase farmer income and livelihood opportunities, without the requirement for more land, and will take account of changes in climate and increasing costs of fertilizer, water and labor.

Evaluation Methodology

CRP MAIZE was evaluated according to criteria consistent with the Evaluation Policy and Standards of the CGIAR, covering relevance, quality of science, effectiveness, efficiency, impact and sustainability. The evaluation included both summative and formative aspects. The summative part encompassed an assessment of research outcomes, primarily from pre-CRP research and outputs from current research and the period leading to CRP MAIZE. The formative aspects of the evaluation focused on current research and evolution of CRP MAIZE over the past four years from the perspective of program design and governance and management arrangements.

The evaluation based its findings, conclusions and recommendations on multiple data collection methods and analysis, and the triangulation of evidence collected from different sources, including: desk review of key program documents and assessments; researcher surveys and interviews of over 100 CGIAR staff and external partners; field visits to selected sites in five countries; bibliometric analysis of MAIZE publications, H-index analysis of research leaders and an in-depth analysis of a further 22 publications.

Main Findings and Conclusions

Overall, the evaluation concluded that CRP MAIZE is progressing well and is on track in reaching most of its near-term milestones and targets. Based on progress observed, the evaluation stated that it was highly plausible that MAIZE and its partners will reach the medium-term goal, which is to increase maize productivity by 7% in 2020 and 33% in 2030. The evaluation team concluded that the CRP MAIZE program warrants continuation beyond the 2015-2016 extension phase.

Program focus, relevance, quality of science and likely effectiveness

CRP MAIZE research design and approaches were found to be innovative and methodologically mostly up-to-date. The evaluation team found that the adoption of improved maize varieties as a result of past CIMMYT and IITA breeding and partnerships is widespread, although some strategic impact assessment issues still need to be addressed.

The evaluation team found that the CRP MAIZE has a strong comparative advantage in the global setting, care of the unique genetic resources held in trust by the two centers, comprehensive partnerships, and long-term presence in and delivery of germplasm in priority regions. However, the team also identified areas where national programs of other research suppliers may have a better comparative advantage; such as post-harvest technology and applied aflatoxin research. The evaluation team concluded that for some geographic areas, CRP MAIZE should reconsider its role in deploying finished hybrid products.

The evaluation report highlighted and acknowledged CRP MAIZE's rapid and efficient response to the outbreak of MLN in eastern Africa. The response illustrated the responsiveness of CRP MAIZE management, as well as the value of strong partnerships with National Research Programs and with the private sector, and serves as a good example of what MAIZE can achieve with partnerships (funding, infrastructure, research) in the short term in response to a major breeding challenge. At the same time, the evaluation emphasized the importance of foresight on emerging issues.

The evaluation team found that the quality of CRP MAIZE science is good, even excellent in some areas. However, while CRP MAIZE publication record is commendable, there exist challenges to ensure that the best science is deployed in breeding programs in MAIZE and among partners. The evaluation team found that there is scope for CRP MAIZE to enhance the quality and efficiency of its breeding processes, for example for leveraging germplasm globally and among projects, by learning from the best practices in the private sector.

CRP MAIZE impact pathways were found to be generally well-defined, but more attention should be given to outputs that contribute to more than a single IDO and where there are strong inter-linkages among Flagships. Coherence could be further strengthened by improving the impact pathways for Flagships, particularly concerning their inter-linkages and the assumptions that relate to the doubling of productivity in the target regions. Incorporating social science with other research activities in a cross-cutting manner, rather than packaging it with post-harvest research in Flagship 5 (in the research strategy of Inclusive and profitable maize futures), would improve the CRP's strategic orientation and ensure continuing relevance. There is also specific need to integrate socio-economic research with germplasm improvement and agronomy.

Furthermore, the program's effectiveness can be improved through development of protocols for research operations and delivery, and by establishing a more pro-active research and monitoring capacity for projecting emerging issues in maize diseases and environmental characterization. Links with other CRPs needed to be strengthened, particularly regarding agronomy.

Recommendations

The Evaluation Team made a total of 11 recommendations presented below:

- 1** Given the evolution of the private sector, MAIZE will need to **continue to assess its target smallholder groups**, ecologies, geographies and commercial seed markets. This assessment should aim at:
 - Accurately defining the germplasm products and associated technologies needed – regarding delivery of improved lines, parental lines, hybrids (finished products) and technical issues of maturity, disease and stress tolerance, and grain quality attributes and its unique support of managed stress networks.
 - Establishing “rules” to customize and change MAIZE roles and involvement, e.g. default focus should be delivery of regionally-adapted improved lines and expert science/capability development in markers, traits and phenotyping.
- 2** MAIZE should **review its priorities in FPs 4 and 5 where it has less comparative advantage and where smallholders already have a certain access to appropriate technology**. This needs to be considered in the light of the large proportion of W3 funding. In particular, MAIZE needs to consider reducing efforts in final product (hybrid) delivery where the private sector is strong. MAIZE should also consider reducing investments in the non-germplasm components of FP5 areas of aflatoxin and postharvest storage research where other agencies have greater comparative advantage.
- 3** MAIZE should **establish pro-active research and monitoring capability to provide foresight** on emerging issues in diseases and to support environmental characterization.
- 4** MAIZE should **improve deployment of new phenotyping technologies** into breeding and extend science into trait dissection, plant-based phenotyping and modelling for adaptive traits through engagement with other CRPs and groups of excellence. A study to benchmark research activities in MAIZE with best-practice in private sector should be conducted to identify opportunities for improvement.
- 5** MAIZE should continue to support the deployment of a broad array of germplasm options and genetic resources and broaden the funding base for discovery and development of high-value trait lines. **More focused product design, network trial results and seed market assessments should be used to decide when to withdraw to a “regional role”**. A study should be commissioned on collaboration models, such as fee-based hybrid consortia, to explore options for funding support toward the development of parental lines.
- 6** MAIZE should **institute management measures to ensure efficiency and effectiveness in management of staff and research activities over the long term**. These measures should include:
 - processes for engaging and motivating staff in delivery oriented research through mentoring, training, and cross disciplinary and cross-institutional lateral learning;
 - protocols for data collection and management;
 - streamlined processes for linking exploratory science and research outputs through multiple stages to intermediate products and final products delivered by MAIZE;
 - integration of project implementation to program objectives over medium- and long-term through innovation platforms and long-term field trials.
- 7** MAIZE should **improve its links in agronomy research with other CRPs** such as Humid Tropics. This would serve development of sustainable intensification indicators and metrics.

- 8** MAIZE should **take action to improve its gender orientation**. It should maintain investments in gender/social inclusion and sharpen its focus on gender analysis at project level. MAIZE should take measures to enhance the employment of women scientists at all levels by improving recruitment, and by developing an enabling environment to attract and retain women scientists.
- 9** MAIZE should **develop a strategy for impact assessment that sets clear priorities** for focusing such assessments, provides an analytical framework and elaborates on the use of impact pathways in planning and documenting scaling up of results and impact.
- 10** MAIZE should **enhance the conduct and use of impact assessment**. The steps to be taken include:
 - Adequate resources are allocated in major project proposals to enable ex-post impact assessment at the end of project support and strengthen feedback to MAIZE for portfolio development.
 - Proactive planning is done to ensure that results from adoption and impact studies feedback to specification of desired technology characteristics in project design.
 - More systematic studies are conducted on the impact of gender on technology adoption and its implication for technology design.
- 11** CIMMYT and IITA should **agree on the establishment of a single global maize program** in the CGIAR that integrates efforts of the two centers. This MAIZE program should be led by a director.

Management Response

The MAIZE Independent Stakeholder Committee and Management Committee thanked the evaluation team and the IEA for the conscientious and professional implementation of the review, and provided a CRP management response. The response stated full agreement with nine of the evaluation recommendations, with partial agreement with the remaining three. It listed a number of short and long-term actions currently being undertaken by the CRP to address the evaluation findings and recommendations, the most immediate of which is the establishment of a single global maize program, led by the MAIZE CRP Director. In addition, and as part of the CRP management response, a matrix was included detailing the response, timeframe and associated costs (if any) to each individual recommendation.

CRP management partially agreed with recommendations 2, 3 and 6, and provided a detailed response for each. Regarding recommendation 2 on reviewing priorities in certain geographic areas where there is a strong private sector presence, CRP management stated that the MAIZE presence in those geographic areas focus on areas of work, needs, or populations not addressed by the private sector. As for recommendations 3 and 6, CRP management agreed in principle to the recommendations, however indicated action would only be possible through donor engagement and stability in longer-term funding.

Further Information

Visit the IEA website for evaluation outputs and information (team profiles, TORs, Inception Report, Final Evaluation Report, and Annexes) as well as the CRP Management Response and Consortium response: <http://iea.cgiar.org/evaluating/crp-evaluation-of-maize/>