



WHEAT-AgriFood Systems CRP  
Plan of Work and Budget (POWB) for 2018  
Template

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## CGIAR CRP Plan of Work and Budget (POWB) Template

Name of the CRP: AFS-CRP WHEAT

Name of the Lead Center: CIMMYT

List of participating Centers and other key partners (strategic partners, Phase II Proposal): ICARDA, BBSRC, ICAR (India), ACIAR, INIA (Bolivia), INIA (Uruguay), INRA (Morocco), IRESA (Tunisia), G-20 Wheat Initiative

### 1. Expected Key Results

**1.1 Adjustments/ Changes to Your Theories of Change:** [Please provide (in a few bullets) any major modifications to the overall balance of the program and/or Theory of change, and explain why these have occurred at CRP level. If major changes have been made since the CRP proposal was published, please annex a brief updated summary of the CRP.]

No significant adjustments planned, apart from continuing the trend of slightly larger relative W1&2 allocation to FP4 (sustainable intensification), driven by increasing capacity and resource mobilization in MENA region and applying scaling-out tools/approaches.

**1.2 Expected CRP Progress Towards Intermediate Outcomes and SLOs:** [Please provide a short narrative of expected highlights of the CRP expected in 2018: for instance, Key innovations or intermediate outcomes? Cross-cutting areas? Please use bullets where possible. Please complete [Table A: Planned Milestones](#). \*Note that these summaries will be shared publicly in any system-level synthesis of plans for publication in 2018.]

Important deliverables per 2022 WHEAT outcomes (linked to specific sub-IDOs) are:

*Last mile providers' increased access and promotion of technologies to farmers:* Use of scaling tool in existing projects, scaling approaches white paper and Scaling Community of Practice; inter-Center design and implementation of sustainable intensification & improved varieties programs in Iran and North Africa.

*Farmers have greater awareness and access to, and increased adoption and adaptation of improved technologies:* Case studies on optimization of wheat-based farming systems using FarmDesign; framework, methodology & protocols on remote sensing technology for in-season decision making on input use.

*Breeders develop improved varieties more efficiently through greater access and use of documented germplasm and tools:* CIMMYT and ICARDA germplasm, phenotypic, and genotypic data loaded to centralized internal data management systems; High throughput phenotyping methods developed and implemented; winter and spring wheats characterized for stress adaptive traits and made available to NARS cooperators.

*Crop researchers worldwide increased use of novel germplasm and tools for validation, refinement and development of products:* Genetic stocks with new alleles for priority traits provided to breeders for introgression into elite lines; greater and faster genetic gains; increased selection efficiency (Genomic Selection); CIMMYT hybrids available for use by NARS; Durum, winter and spring wheat lines characterized for resistance to rusts, SBD, septoria, tan spot, fusarium, wheat blast resistance, for processing quality and nutritional traits – and made available to cooperators and for adaptive breeding and releasing to farmers.

*National and regional policy makers improved policy-making and increased investment, based on evidence:* Developing a strategy or position on Nutritional Priorities under WHEAT and on quantitative gender & youth research in cereal based-agri food systems; Improving on ex ante targeting and impact assessment, including on 'Rural transformation and evolving food dietary patterns in South Asia', new blast resistant wheat in Bangladesh, as well as feasible alternative crops to combat wheat blast, scenarios for Mexican wheat mega-environments under climate change

scenarios 2030 and 2050 and the impact of climate change in CWANA in relation to heat-adapted wheat varieties.

**1.3 Obtaining Evidence on Relevant Outcomes and Impacts:** [Please provide a short narrative for any outcome case studies, impact assessment or adoption studies planned in 2018 that are expected to provide evidence on key links between relevant research outputs, outcomes and long-term impacts. This may include relevant planned studies by others, e.g. SPIA or external partners. Please complete [Table B: Planned Studies for Relevant Outcomes and Impacts.](#)]

- Several foresight, ex ante and ex post impact and adoption studies are planned, both under FP1 W1&2-funded R4D and under WHEAT Partner Budget: Wheat blast, nutritional quality, dietary patterns change in South Asia, zero till adoption in India, including Happy Seeder/sustainable intensification, Punjab, India.
- Ex ante Sustainable Intensification and crop/livestock interaction impact analysis for Morocco, Tunisia, North Africa, including gender dimensions (Egypt, Morocco, Uzbekistan)
- Monitoring of CGIAR-derived variety release and adoption (global), including through DNA fingerprinting (Ethiopia)
- Compilation of adoption/impact research under WHEAT, assess implications for future adoption/impact studies
- Seed systems and (crop improvement) adoption or impact studies for Near and Central Asian countries (Turkey, Uzbekistan, farmers' variety adoption; 3 Central Asian countries)
- Meta-data analysis of Conservation Agriculture technologies in wheat systems of South Asia, publication on "How CA based SI in wheat systems delivers to multiple sustainable development objectives based on the long-term research trials on CA" and potential for smallholder precision nutrient management tools and techniques, based on the multi-year on-farm validation trials in 4 South Asian countries.

**1.4 Plans by CRP Flagships:** [Please summarize the plans for each flagship in 2018, including any plans for new directions or partnerships, and identifying any areas of work that are being discontinued. If major changes have been made to a flagship since the CRP proposal was published, please annex a brief summary of the current flagship program with the updated theory of change.]

FP1 will harness and share more learning from the GENNOVATE case studies, further roll out gender capacity strengthening, invest more in nutrition and health research topics, from supply (breeding; traits) and demand (dietary patterns change) perspectives and deploy more W1&2 funding for impact assessment assessment and foresight/targeting on nutrition and health, from supply (breeding; traits) and demand (dietary patterns change) perspectives.

FP2 will focus on reviewing and prioritizing opportunities for genetic diversity to contribute to sustainable, reduced-footprint agriculture, after large investments in geno- and phenotyping and gene discovery during Phase I (which continue in Phase II). FP2 scientists will continue to optimize support to breeders (methods, tools, and bioinformatics). Scientists will continue to explore genetic diversity (e.g. for root capacity, night temperature) and aim to better understand interactions with CO<sub>2</sub> and other GHGs; also, responses to particular types of heat shocks.

FP3 is committed to kick off the Heat and Drought Wheat Improvement Consortium (HeDWIC) with W1&2 funding, by setting up project coordination and establishing a baseline of ongoing relevant research projects worldwide and a gap analysis. FP3 will collaborate with NARS partners to maintain and expand precision phenotyping platforms and the Global Breeding Program will maintain strong breeding pipelines and partnerships to deliver superior varieties.

FP4 researchers will continue their work on developing Sustainable Intensification indicators and metrics at landscape level, the use of geospatial information to better target interventions and test

their usefulness for baselining and impact assessment. FP4.4, in collaboration with other Clusters of Activity and other CRPs, will develop scaling approaches, by testing a scaling tool within existing R4D projects. ICARDA and CIMMYT will build capacity for Sustainable Intensification in North Africa, in collaboration with INRA Morocco.

## 1.5. Cross Cutting Dimensions

**1.5.1 Gender, Youth and Capacity Development:** [Please briefly summarize the main areas of work in 2018 relevant to cross-cutting dimensions. Indicate FP number in parenthesis if relevant. Please complete [Table C: Cross-cutting Aspect of Expected Outputs](#). (Table is optional in 2018 POWB)]

New initiatives to better integrate gender R4D within the WHEAT FPs are: A visiting scientist to lead on strategic guidance concerning quantitative research on gender & youth in cereal-based agri-food systems; establish a partnership with ICBA, to help build new generation of female wheat scientists in MENA region (TAMKEEN Program), which complements the existing Arab Fund for Economic and Social Development-funded project for fellow- and scholarships.

Ongoing R4D: Synthesis of GENNOVATE gender case studies, including comparative research on specific gender themes (e.g. household bargaining over livelihoods and assets). With regard to Gender monitoring and capacity strengthening, the CoA1.3 team will finalize a framework for monitoring gender integration in portfolio and integrating gender capabilities (training, on-the-job learning) into a Learning accountability system.

WHEAT continues to implement its Capacity Development strategy by 1) providing or contributing to training of NARES partners 2) supporting a culture of learning and collaboration through the implementation of the Learning Management System (LMS; co-funded by MAIZE), 3) fund events, such as workshops, to facilitate learning and new knowledge generation across WHEAT Clusters and FPs.

**1.5.2 Open Data and Intellectual Assets:** [Please highlight any specific plans you have to move forward in these areas in 2018.]

A forward-facing data warehouse with IP-compliant, cross-project data storage and query capabilities will make CGIAR germplasm data more readily available (equity in access) in a structured, queryable and IP-sensitive manner. Apart from enhanced scientist access, the warehouse makes possible repurposing of existing data for scientific and development advances (50% co-funding from MAIZE).

In the (pre-)breeding domain, developed donors, QTLs, genes and gene-based markers for different traits are shared openly after publication in journals with all participating institutes as well as NARS institutions working on rice. Developed breeding lines are shared freely with public sector organization for evaluation and release. All reports and analyzed data for multi-location evaluation are also published openly. WHEAT centers use the existing SMTA and customized MTA for germplasm exchange.

The repositories currently used in MAIZE are summarized below:

| Name   | Repository Technology | URL   | FAIR compliant? |
|--|-----------------------|---|-----------------|
| CIMMYT Institutional Multimedia Publications Repository    | DSpace                | <a href="http://repository.cimmyt.org/">http://repository.cimmyt.org/</a> | Yes             |
| CIMMYT Institutional Research Data and Software Repository | Dataverse             | <a href="http://data.cimmyt.org/">http://data.cimmyt.org/</a>             | Yes             |

For ongoing work to make Open Data/Access a reality, please see 2.3.2 below.

## 2. Planning for CRP Effectiveness and Efficiency

**2.1 CRP Staffing in 2018:** [Please briefly summarize any staffing issues or constraints relevant to CRP capacity. Please note that this section and [Table D on CRP Staffing](#) are optional in this POWB but will be requested in the AR for 2018 onwards and in the POWB 2019.]

2017 staffing levels at both Centers will be maintained. In Table D, WHEAT shows the number of staff delivering W1&2- and/or bilaterally funded projects under WHEAT. Exact FTE calculations are not possible, as some scientists also deliver research under other CRPs and we cannot track all scientists (e.g. national staff hired at CIMMYT country office locations) working only on bilateral projects.

**2.2 Financial Plan for 2018, including use of W1/2:** [Briefly highlight any important issues regarding the financial plan and highlight any particularly interesting plans for the use of W1/2 in 2018. Please Indicate FP number in parenthesis, if relevant. Please complete [Table E: CRP Planned Budget](#), and consider [Table F: Main Areas of W1/2 Expenditure](#) is optional for 2018.]

WHEAT-MC followed SMB advice and is budgeting with 85% (\$12.325M) of SC-endorsed 2018 allocation (\$14.475M). WHEAT-MC intends to deploy all carry-over (\$3.279M) from 2017 during 2018, but not all carry-over has been definitely assigned yet. Thus, total W1&2 per FP figures shown in Table E are best estimates.

W1&2 funding provides the backbone of WHEAT R4D and research management, as it catalyzes impact through strategic investments along the whole impact pathway, from upstream research to downstream development of business models and multi-stakeholder partnerships for innovation and scaling out. W1&2 investments cover the research and technologies/product development component of the impact pathway, as well as the strengthening of the enabling environment, e.g. through policy R4D, capacity development and partnership building. The long-term nature of W1&2 funding provides continuity for the program, which enables WHEAT to go beyond short-term impacts (derived mainly from bilateral projects), aiming for impacts on 5-10 year time scales. Most W1&2 funds are used to support key WHEAT CRP, FP and CoA-level staff, key ME&L activities across all projects and funding sources, gender analyses and gender mainstreaming, capacity development and partnership building for scaling out and new R4D initiatives.

## 2.3 Collaboration and Integration

**2.3.1 New Key External Partnerships:** [Please highlight any interesting new partnerships planned for 2018, including their added value in achieving expected results.]

- INRA Morocco: Build capacity for Sustainable Intensification, North Africa – partnership building and proposal development (EU calls)
- The Nature Conservancy, India: Scoping study to understand Happy Seeder adoption challenges and potential to control crop residue burning in irrigated rice-wheat systems
- Aegean Agricultural Research Institute-Izmir: Precision field stripe rust phenotyping for CWANA - precision rust screening provided to international and national breeding programs, wheat rust races identified, grown wheat cultivars characterized for rust resistance
- Vulcani Institute, Israel: Review and prioritize opportunities for genetic diversity to contribute to sustainable, reduced-footprint agriculture
- ICBA: Build new generation of female wheat scientists in MENA region by working together with TAMKEEN Program (inception phase was funded by BMGF)
- John Innes Center, BIAB (UK): heat tolerance - Gene expression differences (RNAseq) in response to heat shock selected for heat tolerance & candidate genomic regions identified for detailed study.
- SNV (NL), KIT (NL), GIZ (D): Scaling approaches white paper and application of a tool

**2.3.2 New Contribution to and from Platforms:** [Please describe expected services, collaborative research or studies, materials that would be required from each of the CGIAR Platforms (Big Data, Excellence in Breeding, Genebank, and Gender) to support the implementation of the CRP's POWB for 2018, and an indication of the source of the budget where possible (e.g. CRP, Platform, Joint, other). Please complete [Table G: New Internal \(CGIAR\) Collaborations among Programs and between the Program and Platforms.](#)]

The Genebanks Platform and WHEAT shall continue to cooperate on the following: Access to baking & nutritional data to link to genebank accessions, wide crosses pre-breeding, genotyping of germplasm collections including conversion of GBS to SNP markers, data visualization and enhanced access to molecular data. The WHEAT-Independent Steering Committee has recommended that CIMMYT and ICARDA Leadership engage more in support of international germplasm exchange, which would involve the Genebanks Platform's Policy module.

Under the Inspire module of the Big Data Platform, CIMMYT will co-implement two projects (Dave Hodson | Real Time Diagnostics for Wheat Rust | CIMMYT, EIAR, & John Innes Centre & Alise Dykstra & David Guerená | IVR (Interactive Voice Response) Marketing Service | VOTO Mobile & CIMMYT). Under the Organize module, the focus remains on making it easier for others to understand and use WHEAT-funded research data (Open Access, FAIR = Findable, Accessible, Interoperable, and Reusable sharing). WHEAT invests its W1&2 funding in data migration and curation support, data standard development, database user support and scientist software training.

Excellence in Breeding Platform: Both CIMMYT and ICARDA have assigned some W1&2 funds to enable collaboration with EiB with regard to optimization of breeding schemes, Marker-assisted and Genomic Selection, Genetic Gains assessments and generating economics of scale with low- and high-throughput genotyping/sequencing providers.

**2.3.3 New Cross-CRP Interactions:** [Please describe what is expected to be done through new collaborations with other CRPs and any relevant outputs, outcomes and progress towards impact, focusing on results that could not have been produced without such alliances and including the "give and take values" for your CRP. Please complete [Table G: New Internal \(CGIAR\) Collaborations among Programs and between Programs and Platforms.](#)]

Whilst ongoing collaborations, such as on foresight modeling with PIM and five other CRPs are sustained, WHEAT aims to define new collaborations with WLE and FTA, as well as with all other AFS-CRPs on full-purpose crops and either start implementing or jointly fundraising during 2018.

**2.3.4 Expected Efforts on Country Collaboration:** [Please describe expected efforts related to the CGIAR country collaboration initiative in 2018. How will the CRP engage with CGIAR's country collaboration and in which countries? What are the priority themes for collaboration and how will this work be funded?]

WHEAT priorities with regard to country coordination focus on Bangladesh, Ethiopia and Nigeria. WHEAT scientists have participated or co-led initial consultations with national partners in Bangladesh, Ethiopia, India, Kenya, Nepal, Nigeria and Tanzania (for details, please see Phase II Full Proposal, Annex 3.7, Table 37-3).

During the June CRP Leaders Meeting, WHEAT intends to support bottom-up, low-cost efforts at moving forward Country Collaboration forward within a few countries (less than 5).

**2.4 Monitoring, Evaluation, and Learning:** [Please highlight any areas of interest for evaluation, review or learning event planned in 2018, and complete [Table H: Planned Monitoring, Evaluation, and Learning Exercises.](#)]

WHEAT is

- Continuing to play an active role in the cross-CGIAR system Monitoring, Evaluation and Learning Community of Practice to share challenges and best practices, and streamline the MEL work across the system.
- Centralizing planning, monitoring and reporting information for the CRP in the MARLO platform, allowing WHEAT to better link individual projects and areas of research to 2022 outcomes and

the WHEAT impact pathway, as well as supporting budgeting, monitoring research progress, and reporting on CRP results on an annual basis.

Notwithstanding budget restrictions, WHEAT will commission an evaluation of FP2: Novel Tools and Diversity, which will be performed jointly with ICARDA (WHEAT) and MAIZE. This is part of the Phase-II Rolling Evaluation Plan as described in the WHEAT Phase II Proposal.

WHEAT has a small center of expertise dedicated to strengthening project management, and will continue to build capacity in terms of project management, which includes project-level monitoring, evaluation and learning. Project leaders and scientists are encouraged to use new IT tools that will help them to manage their day-to-day activities, and to attend internal trainings to strengthen their project management skills.

WHEAT will review and reflect on FP theories of change at the end of 2018 based on performance data collected and lessons learned, and best practices will be documented. This exercise will inform planning, prioritization and decision making for the next year.

### 3. CRP Management

**3.1 Management of Risks to Your CRP:** Optional space to highlight any particular risks that you foresee coming up in 2018 and any mitigation measures planned. Please refer to [CGIAR Risk Management Guidelines](#).

Institutional and Contextual Risks are currently managed by Centers, on the basis of their respective risk management policies and practices.

The WHEAT risk matrix identifies 10 CRP-specific risks under Compliance (obligations to Consortium; partners do not deliver what they agreed to deliver), General Management (reputational), Change Management (high transaction costs intra-CGIAR), Financial (late payout of W1&2, need to pre-finance), and Technology (loss of CRP-specific data). The WHEAT-MC tracks 3 major risks on quarterly or ad hoc basis, namely W1&2 funding volatility, non-fulfilled obligations by partners funded through the WHEAT Partner Budget and programmatic, delivery-related risks.

**3.2 CRP Management and Governance:** [Please briefly describe any important changes in governance or management expected in 2018, if any.]

WHEAT-ISC Chair since 1st January is John Roy Porter, who has taken over from Tony Fischer. WHEAT-ISC Terms of Reference have been adjusted slightly, upon the initiative of the Lead Center Board of Trustees.

No changes to WHEAT-Management Committee ToRs or composition. It continues to have 3 non-CGIAR members (ACIAR, BBSRC, and ICAR). One ICARDA position (DDG-R) has been vacant, but will be filled starting May 2018.

To better manage W1&2 volatility and achieve efficiency gains, the CRPs-PMU has been restructured. MAIZE and WHEAT share one CRP Program Manager. Both CRP-Management Committees will review the restructuring mid-2018.



## 2018 CRP Plan of Work and Budget (POWB) Template

### TABLES

**Table A: Planned Milestones** [Please include the planned milestones mapped to FP, sub-IDO and 2022 outcomes. Please indicate how W1/2 funding will be used vis-à-vis W3/bilateral]

| FP | Mapped and contributing to Sub-IDO                                      | 2022 CRP outcomes (from proposal)   | 2018 Milestone*  | Budget    |           | Asses of risk to achieve*<br>* (L/M/H) | Means of verification  |
|----|---|---|--|-----------|-----------|--|--|
|    |   |   |  | W1/2      | W3/bil    |  |  |
| 1  | • CC: Increase capacity of beneficiaries to adopt research outputs      | 1.8 National and regional policy makers improved policy-making and increased investment based on evidence   | Targeting incorporates competition for land and spatial dimensions of soil & water degradation   | 357,000   | 1,806,063 | L                                      | Guideline, tool components & user evaluation   |
|    | • CC: Increase capacity of beneficiaries to adopt research outputs      | 1.10 Farmers have greater awareness and access to, and increased adoption and adaptation of improved technologies   | Adoption and impact studies on technologies- rolling plan based on progress of technologies along the theory of change   | 714,000   |           | L                                      | Peer-reviewed publications, knowledge-sharing activities                                     |
|    | • CC: Increase capacity of beneficiaries to adopt research outputs      | 1.9 Last mile provider (extension partners, farmers organizations, community-based organizations, private sector) increased access and promotion of technologies to farmers | Rapid value chain assessments with proper gender lens conducted to identify opportunities and bottlenecks in WHEAT   | 357,000   |           | M                                      | Peer-reviewed publications, knowledge-sharing activities                                     |
| 2  | • Enhanced genetic gain   | 2.4 Crop researchers world-wide increased use of novel germplasm and tools for validation, refinement and development of products   | More partners use IWYP platform for precision phenotyping  | 2,595,000 | 5,159,530 | L                                      | # partners   |
|    | • Enhanced genetic gain   | 2.5 Breeders develop improved varieties more efficiently through greater access and use of documented germplasm and tools   | Greater number of breeder-ready markers /high value haplotypes (compared to 2017) for prioritized traits identified and validated, deployed in CGIAR breeding programs   |           |           | L                                      | Wheat genetic gain on research station   |
| 3  | • CC: Enhanced institutional capacity of partner research organizations | 3.2 Partner breeding teams increased multidisciplinary and multi-institutional collaboration & 3.4  | New alleles for heat and drought, other climate change-related traits identified and moved into breeding pipeline<br><br>Improved knowledge of genetic basis of climate change adaptation on global scale thru combination of GS, platforms, unified databases | 1,382,600 | 9,966,912 | M                                      | # sets of data published<br>#available pre breeding materials                                |
|    | • Enhanced genetic gain   | 3.3 Partner breeding teams improved breeding processes by adopting new technologies, methodologies, approaches and genetic resources  | sustainable seed system optimized in 2-3 countries (pilots, with scaling-out potential)  | 1,382,600 |           | M                                      | # of publically available new or improved tools  |
|    | • Reduced smallholders production risk                                  | 3.6 National regulators of crop variety release improved enabling environment to speeding-up release of improved varieties  | National regulators of variety release and seed supply provide enabling environment to speed up release of improved varieties and farmers' access to quality seed, in 2-3 target countries   | 1,382,600 |           | M                                      | % change cultivar replacement rates (% change compared to benchmark)<br><br>Evaluation study |

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|   | <ul style="list-style-type: none"> <li>Reduced smallholders production risk</li> </ul>   | 3.7 Extension partners increased access and promotion of adoption of improved varieties to farmers, and increased investment in emerging private sector circumstances & 3.8 farmer organizations increased access ... & 3.12 Non-and-subsistence farmers adopted improved varieties | Improved, documented understanding of specific wheat seed systems (farmer's seed commercial behavior, seed demand, marketing, econ of production) / 2-3 NARES identified performance gaps, cap dev needs,<br><br>Improve consumer acceptability of high flour extraction rate and whole grain flour<br><br>Greater farmer adoption of CGIAR-derived released varieties in specific WHEAT target countries, compared to 1994-2014 average | 2,765,200 |            | M | Peer-reviewed publications, knowledge-sharing activities   |
|   | <ul style="list-style-type: none"> <li>CC: Technologies that reduce women's labor and energy expenditure developed and disseminated</li> </ul> |   |  |           |            | M | Market research  |
|   | <ul style="list-style-type: none"> <li>Reduce pre- and post-harvest losses, including those caused by climate change</li> </ul>                |   |  |           |            | M | # of farmers and others adopting new WHEAT technologies  |
| 4 | <ul style="list-style-type: none"> <li>CC: Enhanced institutional capacity of partner research organizations</li> </ul>                        | 4.4 NARS increased use of participatory approach in system research & 4.8 Actors in SI increased consideration and integration of gender and social inclusion into policies, processes and practices.   | Multi-criteria assessments taking into account environmental and social acceptability aspects, based on standardized protocols for multi-criteria assessments of advanced crop management packages<br><br>Targeting incorporates competition for land and spatial dimensions of soil & water degradation   | 733,500   | 12,449,017 | L | Specific combination of CSA technologies, practices (incl services) validated for specific agro-ecologies and socio-economic contexts (sub-nat.) |
|   | <ul style="list-style-type: none"> <li>Increased access to productive assets, including natural resources</li> </ul>                           | 4.9 Smallholder farmers increased their capacity to adopt and adapt SI practices and products (associated with crosscutting sub-IDO).   | increased adoption of combinations of SI strategies, technologies in specific target geographies compared to 2016  | 366,750   |            | H | # of farmers and others adopting new WHEAT technologies  |
|   | <ul style="list-style-type: none"> <li>CC: Increase capacity of beneficiaries to adopt research outputs</li> </ul>                             | 4.6 Private sector (and public sector) increased provision of services to smallholder farmers to increase their ability to adopt SI practices and products  | Optimization of cropping systems support adaptation to climate change validated in specific WHEAT target geographies   | 366,750   |            | M | Indicator for farmer access to agro-climate information services   |

\* Milestones include both outputs, output use and outcomes along the impact pathways as appropriate to the scale and maturity of the work. In this table A, please focus as much as possible on significant milestones towards outcomes which can be justified the completion at reporting.

\*\*Please list the major risks focusing more on technical or geographic considerations that may hinder the expected delivery of results by CRP.

Caveat: W1&2 figures above do not include CRP Mgmt. and WHEAT Partner Grant budgets.

**Table B: Planned Studies for Relevant Outcomes and Impacts** [Please complete the following table to share any outcome case studies, impact assessment or adoption studies planned. Please indicate relevant sub-IDOs, and provide links to long-term expected outcomes and impacts, if appropriate. Mention any cross-cutting dimensions explicitly, if any.]

| Planned topic of study   | Geo scope      | Relevant to Sub-IDO, or SRF target if appropriate   | Comments  |
|--|----------------|---|---|
| One new evidence-based study analyzing the negative consequences of climate change on food security in the targeted areas of Turkey, Iran and Morocco developed, disseminated. | Multi-national | <ul style="list-style-type: none"> <li>Reduce pre- and post-harvest losses, including those caused by climate change</li> </ul> | Calibrate representative wheat technologies for target countries to assess impact of climate change on wheat productivity by P5; Develop and use a dynamic bio-economic model to quantify impact of climate change on food security during the second year of the project |

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| Strategies developed for the diversification of local agricultural and food systems through the use of a wider range of locally adapted crops and varieties. | Multi-national                             | <ul style="list-style-type: none"> <li>• Increased conservation and use of genetic resources</li> </ul>   | Future climate scenarios and spatial modeling to identify hot spots for decreased wheat production in Turkey, Iran and Morocco in an uncertain climate; Based on hot spot areas (decreased wheat production highly expected) from modeling (activity 5.1), develop targeting strategy for wheat technologies (for example, drought-tolerant varieties can be targeted in places where the future climate is projected to be drier) during the third year of the project (August 2017 to August 2018). |
| Impact assessment of the SRSFI project (ACIAR), Bangladesh & Nepal   | Sub-National: Multiple provinces or states | <ul style="list-style-type: none"> <li>• Enhanced genetic gain</li> <li>• # of more farm households have adopted improved varieties, breeds or trees</li> </ul>   | The study will cover wheat technology adoption by farmers in sub project areas and assess improvement of farmers by project intervention  |
| Adoption of wheat using DNA technology in Ethiopia   | National                                   | <ul style="list-style-type: none"> <li>• Reduced smallholders production risk</li> <li>• # of more farm households have adopted improved varieties, breeds or trees</li> </ul>  | first nationally representative results using DNA technology to look at adoption of new varieties of wheat  |
| Adoption of improved wheat technologies (varieties) in Central Asia (Tajikistan, Kyrgyzstan, Uzbekistan)   | National                                   | <ul style="list-style-type: none"> <li>• Reduced smallholders production risk</li> <li>• # of more farm households have adopted improved varieties, breeds or trees</li> </ul>  | first time that CIMMYT, together with ICARDA, is pursuing adoption studies in Central Asia  |
| Adoption of sustainable intensification technology in the wheat-growing area of India  | Sub-National: Single province or state     | <ul style="list-style-type: none"> <li>• Agricultural systems diversified, intensified in ways that protect soils and water</li> <li>• Increase in water and nutrient (inorganic, biological) use efficiency in agro-ecosystems, including through recycling and reuse</li> </ul> | Together with TNC, this study explores the adoption of Happy Seeder in Punjab, India  |
| Adoption of improved wheat varieties in selected CWANA countries   | National                                   | <ul style="list-style-type: none"> <li>• Reduced smallholders production risk</li> <li>• # of more farm households have adopted improved varieties, breeds or trees</li> </ul>  | study seeks to understand drivers of adoption or non-adoption of improved wheat varieties in selected CWANA countries   |

**Table C: Cross-cutting Aspect of Expected Outputs or Deliverables (OPTIONAL)** [Please note that Table C is optional in 2018 POWB. Please present expected total overall number of outputs, and % of outputs with principal (scored 2), significant (scored 1), and not targeted (scored 0), for gender, youth and capacity development.]

|  |  |  |                            |
|--|--|--|----------------------------|
|  |  |  | <b>Number (%) scored 0</b> |
|--|--|--|----------------------------|

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| Cross-cutting | Number (%) scored<br>2 (Principal) | Number (%) scored<br>1 (significant) |        | Total overall number<br>of outputs |
|---------------|------------------------------------|--------------------------------------|--------|------------------------------------|
| Gender        | 5.08%                              | 24.44%                               | 70.48% | 315                                |
| Youth         | 1.27%                              | 21.59%                               | 77.14% |                                    |
| CapDev        | 10.16%                             | 40.95%                               | 48.89% |                                    |

**Table D: CRP Staffing (OPTIONAL IN POWB 2018)** [Please note Table D is optional for 2018 POWB. Please fill in the table for 2018 CRP staffing.]

| Category                                       | Female (FTE*) | Male (FTE) | Total FTE  | % female (FTE) |
|--|---------------|------------|------------|----------------|
| <i>Program director &amp; flagship leaders</i> |               | 9          | 9          | 0              |
| <i>Principal Investigators = CoA Leads</i>     | 6             | 34         | 39         | 15             |
| <i>Other Senior Scientists (not PIs)</i>       | 5             | 30         | 35         | 15             |
| <i>Post-docs / junior scientists</i>           | 11            | 31         | 47         | 23             |
| <i>Research fellows</i>                        |               |            |            |                |
| <i>Other science support staff</i>             |               |            |            |                |
| <b>TOTAL CRP</b>                               | <b>22</b>     | <b>104</b> | <b>126</b> |                |

\*FTE= Full Time Equivalent

Caveats: 1) WHEAT counts # of CIMMYT and ICARDA staff, not FTE's, as the same staff perform different roles, e.g. FP Leader and Principal Investigator; 1 FTE may spend 20% on the former and 80% on the latter. FP Leaders are also engaged in other CRPs, making assignment of FTE% more complicated. 2) Staff are funded to different degrees by W1&2 versus bilateral. Not all scientists working only on bilateral projects under WHEAT are counted. 3) External (non-CGIAR) WHEAT-MC and WHEAT-ISC members are not counted. 4) Science support staff are not counted, as they support CIMMYT's and ICARDA's participation in several CRPs.

**Table E: CRP Planned Budget** [Please fill the table based on the planned CRP budget for 2018.]

|                                      | Planned budget 2018 |                   |                   | Comments on major changes   |
|--------------------------------------|---------------------|-------------------|-------------------|---|
|                                      | W1/2                | W3/bilateral      | Total             |   |
| FP1                                  | 1,428,000           | 1,806,063         | 3,234,063         |   |
| FP2                                  | 2,595,000           | 5,159,530         | 7,754,530         |   |
| FP3                                  | 6,913,000           | 9,966,912         | 16,879,912        |   |
| FP4                                  | 1,467,000           | 12,449,017        | 13,916,868        |   |
| Strategic Competitive Research grant | 1,840,000           |                   | 1,840,000         | Partner grants not incorporated in FP budgets                     |
| CRP Management & Support Cost        | 1,361,000           |                   | 1,361,000         |   |
| <b>CRP Total</b>                     | <b>15,604,000</b>   | <b>29,382,374</b> | <b>41,785,374</b> | Total new 2018 W1&2 income estimated 12,235M (85% of SC-endorsed) |

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| 2018 W1&2 w/o carry-over      |                                   |                   |
|-------------------------------|-----------------------------------|-------------------|
|                               | System Council / SMB-<br>approved | W-MC 85%          |
| CRP Management<br>incl ICARDA | 1,600,794                         | 1,360,675         |
| ICARDA                        | 2,890,386                         | 2,456,828         |
| CIMMYT                        | 8,606,825                         | 7,315,801         |
| Partners                      | 1,401,996                         | 1,191,697         |
| Total                         | 14,500,000                        | <u>12,325,000</u> |

**Table F: Main Areas of W1/2 Expenditure (OPTIONAL in POWB 2018)**

| Expenditure area *  | Estimated percentage of total W1/2 funding in 2018** | Space for your comments<br>[please remove notes below]  |
|---|--|---|
| <b>Planned research: principal or sole funding source</b> | 60   | <p>Synthesis of previous foresight studies, for future priority-setting</p> <p>Continued genotypic characterization of genebank accessions and pre-breeding material</p> <p>Further develop high-throughput phenotyping methods</p> <p>Develop gene editing capability and apply in specific genomic environments; continue R4D on genomic selection to integrate molecular approaches in breeding</p> <p>Provide data migration and curation support and software training, bioinformatics/statistics support to scientists; analytical and decision tools to help breeders in the standardization of methods and to do breeding more efficiently</p> <p>Breeding research: Winter wheat, Central Asia, CWANA, wheat precision phenotyping platforms (WPPPs), pre-breeding spring/winter wheat all agro-ecological zones, durum wheat, all pests and diseases of global/regional importance except rusts, marker-assisted breeding/ molecular research</p> <p>SI Indicators and metrics at landscape level, use of geospatial information for better baselining and impact assessment of SI technologies</p> <p>Develop and share know-how about scaling approaches appropriate to wheat based farming systems; apply a navigation tool to assess and integrate essential scaling principles in projects</p> |

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|   |   |   |
|---|---|---|
| <b>Planned research:<br/>Leveraging W3/bilateral<br/>funding</b>              | 15  | <p>Ex-ante impact assessment of wheat blast-resistant varieties in Bangladesh (e.g. investment / business case)</p> <p>Proposal development for Foresight and Impact Assessment projects</p> <p>Completion and dissemination of value chain potential study (Rwanda &amp; Zambia)</p> <p>Proposal development, partnership building: Sustainable Intensification North Africa, value chains/market interventions</p> <p>Launch a 'HeDWIC' type initiative to address wheat production in LDCs under global warming during the next 3 decades</p> <p>Generate science based evidence on how CA based SI contributes to simultaneously address a number of SDGs, to help governments on their investment prioritization; Mechanization of wheat based systems in Sub-Saharan Africa</p> <p>Partnerships and collaboration with large scaling actors</p> |
| <b>Catalyzing new research<br/>areas</b>                                      | 15  | <p>Rural transformation and evolving food dietary patterns in South Asia</p> <p>Rethinking nutritional priorities in WHEAT AFS (visiting scientist) and Understanding stakeholder behavior (visiting scientist)</p> <p>Development of genetic engineering capacity for gene discovery and creation of novel diversity; Introgress new genetic diversity from wheat wild relatives for priority traits</p> <p>Early detection of wheat disease with airborne multi-spectral, hyper spectral and thermal sensors</p> <p>Develop &amp; adapt scalable smallholder precision input management technologies, tools, techniques, strategies and innovations</p>   |
| <b>Gender</b>   | 10  | <p>Position paper on quantitative gender and youth in cereal-based AFS (visiting scientist)</p> <p>Coordination and strengthening Gender and Social Inclusion portfolio, synthesis of Gender case studies (builds on GENNOVATE), thematic gender study</p> <p>Gender monitoring and capacity strengthening in WHEAT AFS</p>   |
| <b>Youth</b>  | 5   | <p>Position paper on quantitative gender and youth in cereal-based AFS (visiting scientist)</p>   |
| <b>Capacity development</b>   | 15  | <p>Learning Management System (LMS) rolled out at IITA, ICARDA</p>  |
| <b>Start-up or maintenance of<br/>partnerships (internal or<br/>external)</b> | Cannot be<br>distinguished,<br>extracted            | <p>Partnerships and collaboration with large scaling actors</p> <p>CCAFS / Simulate implications of wheat mega-environments under climate change 2030 (crop modelling)</p>  |
| <b>Monitoring, learning and<br/>self-evaluation</b>                           | 100% overlap<br>with first 2<br>categories<br>above | <p>Synthesis of previous foresight studies, for future priority-setting</p> <p>Generate science based evidence on how CA based SI contributes to simultaneously address a number of SDGs, to help governments on their investment prioritization</p>  |
| <b>Evaluation studies and<br/>Impact Assessment studies</b>                   | 5   | <p>Ex-ante impact assessment of wheat blast-resistant varieties in Bangladesh</p> <p>Compilation of impact/adoption R4D under WHEAT; impact assessments for Central Asia/variety adoption, S Asia/Sustainable Intensification in heterogeneous production systems</p>   |

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|                               |            |   |
|-------------------------------|------------|---|
| <b>Emergency/contingency</b>  | 0          | WHEAT-MC approved a 2018 W1&2 budget at 85% of System Council-endorsed. The 15% difference acts as contingency. |
| <b>Other</b>                  |            |   |
| <b>TOTAL FUNDING (AMOUNT)</b> | 15,604,000 |   |

\*use these categories wherever possible, delete unneeded rows and add rows if none of these are suitable.

\*\*we recognize that (i) some funding may fit more than one category but please try to apportion funding to its principal use and (ii) percentages may not add up to 100%

**Table G: New Internal (CGIAR) Collaborations among Programs and between the Program and Platforms** [Please list up to five most relevant new internal collaborations for 2018 among programs, and

programs and platforms, using the following table.]

| Name of CRP or Platform  | Brief description of collaboration (give and take among CRPs) and value added*   | Relevant FP |
|--------------------------|--|-------------|
| CCAFS                    | Soil carbon sequestration; identification of best bet technologies, joint proposal development   | FP4         |
| FTA, MAIZE               | Integrate agro-forestry into Sustainable Intensification interventions, for increased diversity of sources of livelihoods/income   | FP4         |
| All AFS-CRPs             | Dual/Full-purpose crops (for food, feed, energy and other uses): Program development   | FP3, FP4    |
| Big Data Platform        | Real-time diagnostics for wheat rust; Interactive voice response marketing service   | FP3, FP4    |
| WLE, MAIZE               | Specify collaboration and joint fundraising opportunities with WLE FP2 Land & Water Solutions  | FP1, FP4    |
| FTA, WLE, other AFS-CRPs | identify the need for develop an action plan to share capability across CRPs in systems analysis and modelling   | FP1, FP4    |
| EiB                      | Statistical and biometrics capacity building, improved return rates/quality from IWIN cooperators (NARS), integration of molecular techniques into breeding, including decision/analytical tools | FP2, FP3    |

\*e.g. scientific or efficiency benefits

**Table H: Planned Monitoring, Evaluation, and Learning Exercises** [Planned evaluations, impact assessments and other learning exercises for 2018.]

| Planned studies/learning exercises in 2018  | Comments   |
|---|--|
| Evaluation of FP2: Novel Tools and Diversity  | performed jointly with ICARDA (WHEAT) and MAIZE  |
| Rethinking nutritional priorities in WHEAT agri-food systems  | Visiting scholar, position paper, learning and strategy events                           |
| Better understanding stakeholder behavior; will generate evidence on stakeholder behaviour, allowing national and regional policy makers to design more effective and evidence-based policies | Visiting scholar, synthesis paper based on existing IA/adoption studies, learning events |