# **Cluster of Activities Report Template**

**Cluster annual report - 2018**

**COA 3.3: Testing, adapting and validating options for sustainable intensification**

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# **MAIN ACHIEVEMENTS**

This section provides a synthesis of main progress and achievements in implementing the annual Plan of Work. Fill this section considering the content of the GLDC POWB 2018 (<http://crp-gldc.icrisat.org/GLDC_POWB-Final.pdf> ). In particular, review the list Outputs (Annex 1) and complete the missing information in MEL. Output related information is essential to inform indicators on Number of innovation and Milestones achievement.

Use the sections below to highlight key findings with gender, youth, capacity development and climate change relevance.

**Impact assessment across scales and dimensions:**

* Reviewed sustainable intensification (SI) criteria and indicators and frameworks. We extracted useful elements from existing frameworks to guide efforts of SI assessments in the context of agricultural research for development projects. Developed survey questionnaire for SI assessment and household level data collected from 400 households from Niger and Burkina Faso.
* Multi-stakeholder workshop for improved interface among farmers, agricultural extensions and national agricultural research for greater awareness on sustainability dimensions and complementary approaches for comprehension of farming system sustainability.
* A methodology optimized for capturing heterogeneity of farming systems and landscapes and first calibration of the remote sensing crop-yield models were performed for above ground biomass for groundnut and pearl millet yields covering >450 farm households.
* Impact of abiotic stresses assessed for millet-sorghum based farming systems in Burkina Faso, Mali and Niger. Biotic stresses assessed for lentil and chickpea. Farmers’ coping strategies documented for both biotic and abiotic stresses.
* Thirty crop trials conducted to assess the various compost vs mineral fertilizer treatments on the production and nutritional quality of sorghum/millet grain and fodder in Mali influencing agricultural productivity, income, food security and soil health.
* Preliminary gendered characterization analysis of Household Survey Conducted in the Lentil-Chickpea Zones of North-Shewa Amhara Region in Ethiopia (350 HHs) and Houet province, Burkina Faso (428 farm-households) completed

**Evaluating trade-offs and co-designing farming systems for enhanced resilience and income:**

* We developed and piloted systems modelling frameworks (crop modelling, and whole farm bio-economic modelling) to support the upscaling of climate resilient agriculture in semi-arid India- parameterized and validated the whole farm bio-economic model for six locations in Telangana and Maharashtra. We have also initiated building capacity of extension system on systems modelling tools.
* Multi-model systems analysis was used to i*dentify Low Emissions Development Pathways – exploring synergies and trade-offs in Mahbubnagar District, Telangana, India.* Success story case study presented at ISPC Science Forum 2018. <https://www.scienceforum2018.org/sites/default/files/2018-09/SF18_low_emissions_pathways_india_0.pdf>.
* Data collection completed for >400 households and base farm system whole farm model parameterized for crop-livestock systems for one farm type in Niger to generate scenarios evaluating potential impact of intensification interventions on crop-livestock systems and to be shared with stakeholders.
* Improved farm systems, co-designed with Malian farmers, further tested in on-farm, integrated crop, composting and animal feeding trials
* Working paper on “Towards a solution-oriented approach to assess the resource criticality of heterogeneous agricultural livelihood systems”. MEL link: <https://dx.doi.org/20.500.11766/9474>.
* Understanding the climate and market risks activity focused on the development of base data sets and methods for understanding farm to region GxExM interactions through the simulation of on-farm and large-n crop modelling for sub Saharan Africa and South Asia; <https://doi.org/10.1016/j.fcr.2018.03.023>; <https://doi.org/10.1007/978-3-319-78711-4_21>
* The cropping system modelling tools assessed/validated to integrate them into the breeding programs as a decision making support tool on optimization of GxExM for target population of environments. Within this activity we focused on a case-study of sorghum crop improvement program of ICRISAT-IIMR, Hyderabad

**Information and knowledge for targeting gender and nutrition under GLDC farming systems:**

* Gender disaggregated farmers’ information needs assessment with survey of 300 households in Burkina Faso, Mali and Niger. Under the current context women are 15% less likely to adopt improved seed varieties compared to men. Analysis reveals that agriculture training access, education, access to extension services, and gender have a positive and significant influence on adoption of improved seed varieties.
* A study in SSA identifies gender gaps in technology adoption with women being less likely to adopt new technologies because of their relatively lower access to information, land, credit, and markets.
* Nutrition messaging study generates three outputs: a report on Nutritional dynamics of adolescent girls in selected tribal regions of Telangana, India; a blog post on Talking nutrition with adolescents in tribal regions of Telangana and a draft report on A Study on Nutritional Messaging for Adolescents in Adilabad, Telangana, India
* Based on review of literature and analysis of existing data a report on “Feminization of agriculture: facts, trends and interpretations, India “drafted.
* Participatory sheep fattening activities showed profit-making potential for women in Mali.

# **Outcome cases and policy influenced (proposed)**

Revise and complete the suggested list of outcome cases and policies to be documented

|  |  |  |
| --- | --- | --- |
| **Title of Outcome/ Impact Case Report (OICR) (30 words)** | **Description****(up to 80 words)** | **Geographic scope****(Specify if regional, national, sub-national and provide list of regions/countries)** |
| Enhanced dietary patterns and diversity for pregnant women, lactating mothers, young children and adolescent girls in tribal region, Telangana, India  | Nutri-food Basket approach of introducing the concept of breakfast as a meal time has led to enhancing the dietary patterns and diversity in the diets of pregnant women, lactating mothers, young children and adolescent girls.  The food-based intervention was implemented as a breakfast component in selected locations in the tribal districts of Adilabad, Komaram-Bheem Asifabad and Mancherial in Telangana state. The nutrition messaging activity under GLDC is a Region follow-up of the NFB study based on the findings from the baseline survey. | Region |
| Scaling-up and Popularization of High Yielding Pigeonpea Hybrids for Enhancing Productivity of Smallholder Farmers of Maharashtra, Karnataka, Telangana, Andhra Pradesh and Odisha States, India | Excellent outcome from about 10000 demonstrations/ on-farm trials on hybrid high yielding pigeon pea resulted in 40 to 100% increase in yields and high acceptance by farmers in four states in India. | Region |

|  |  |  |  |
| --- | --- | --- | --- |
| **Name and description of policies modified in design****or implementation, informed by CGIAR research (20-50 words, ideally around 30 words)** | **Type****(policies/ strategies / laws/ regulations/ budgets/ investments/ curricula)** | **Whose policy is this?****The primary organization(s) either designing/promulgating the policy, law, investment (e.g. national government) etc. and/or within which it is operating.** | **Geographic scope****(Specify if regional, national, sub-national and provide list of regions/countries)** |
|  |  |  |  |
|  |  |  |  |

# **MAIN ACHIEVEMENTS WITH GENDER RELEVANCE**

When possible, make reference to outputs reported, milestones completed, outcome cases or policy influence reported

MAX 1500 characters

* Women farmers in Burkina Faso, Mali and Niger were found 3 times more vulnerable to abiotic stresses impacts compared to men.
* Under the current context women are 15% less likely to adopt improved seed varieties compared to men in Burkina Faso, Mali and Niger
* The studies are looking at the challenges, and opportunities, and benefits that recommended packages present for men, women and youth engaged in the production system; and explore variations within and across distinct agricultural livelihood types.

# **MAIN ACHIEVEMENTS WITH Youth RELEVANCE**

When possible, make reference to innovations reported, milestones completed, outcome cases or policy influence reported

MAX 1500 characters

* Systems modelling tools validated in south Asia and West Africa are being established as decision support tools for the youth/young farmers to evaluate returns/cash flows from the integrated farming systems and various alternative technology options .

# **MAIN ACHIEVEMENTS WITH CAPACITY DEVELOPMENT RELEVANCE**

When possible, make reference to innovations reported, milestones completed, outcome cases or policy influence reported

MAX 1500 characters

|  |  |
| --- | --- |
| Capacity building  | Numbers |
| Training workshop on systems modelling for NARS in India | Women: 10; Men: 29 |
| Two weeks hands on training on systems modelling for West Africa staff | Women: 1; Men: 2 |
| Three months capacity building one NARS scientist on systems modelling in Hyderabad | 1 M |
| Training on Designing protocols and survey | Women: 5; Men: 16 |
| Workshop on Sustainability assessment for NARS | Women: 6; Men: 20 |
| Masters students and Ph.D. Student on crop-livestock systems, WUR | Masters students: 1; Ph.D. Student: 1 |
| Masters students and Ph.D. Student on Biotic stress management in Chick pea, ICARDA | Masters students: 1; Ph.D. Student: 2 |
| Ph.D. Student start working on Biomass fluxes in Burkina Faso, WUR | Ph.D. Student: 1 |
| Masters students and Ph.D. Student on Agro-ecosystems yield monitoring and socioeconomic characterization- CIRAD | Masters students: 2; Ph.D. Student: 1 |
| Multi-stakeholders platforms established in Niger and Burkina Faso on Crop-livestock systems and sustainable intensification  | Four numbers with total of about 100 members |
| NARS trained on real time data collection using OPEN DATA KIT in Mali, BF and Niger | Women: 5; Men: 18 |

# **MAIN ACHIEVEMENTS WITH CLIMATE CHANGE RELEVANCE**

When possible, make reference to innovations reported, milestones completed, outcome cases or policy influence reported

MAX 1500 characters

* We developed and piloted systems modelling frameworks (crop modelling, and whole farm bio-economic modelling) to support the upscaling of climate smart agriculture in semi-arid India- parameterized and validated the whole farm bio-economic model for six locations in Telangana and Maharashtra. We have also initiated building capacity of extension system on systems modelling tools.
* Multi-model systems analysis was used to i*dentify Low Emissions Development Pathways – exploring synergies and trade-offs in Mahbubnagar District, Telangana, India.* Success story case study presented at ISPC Science Forum 2018. <https://www.scienceforum2018.org/sites/default/files/2018-09/SF18_low_emissions_pathways_india_0.pdf>.

# **MAIN GAPS AND CHALLENGES**

Describe the main challenges/bottlenecks encountered and the deviation from your annual plan of work.

Please list any relevant review or study on foresight, monitoring and evaluation that has been realized in the last 12 months at the project/cluster level and that has potentially not been implemented under cluster 1-4: Enabling environments and scaling to accelerate impact (Use Annex 2 to provide this list). Provide results from these evaluations and learning processes, if any.

MAX 1500

A main challenge for the work in West Africa is the precarious security situation in Burkina Faso and Mali in particular. Both countries suffer from regular terrorist attacks, which severely restrict the safe movement of researchers and the execution of project activities.

* Current literature on sustainability criteria and indicators is targeting mostly goals/expectations, rather than concrete solutions. There is a need for transitional research and development that involves quantifiable and easy to measure indicators/methods.
* There is a notable underrepresentation of sustainable intensification (SI) in economics and social sciences compared to agricultural, biological and environmental sciences. Moving to a holistic/integrated assessment will require a stronger assessment of the social and economic dimension of SI. Likewise, the current literature emphasizes the farm scale, with less attention for the landscape, community and value chain level.
* Understanding the impact/cost of non-action in terms of improved technologies, innovation systems, gender mainstreaming and lack of information access.
* Implications of mechanization in relation to feminization of agriculture and its impact on nutrition and empowerment.
* How to assess the impact of the nutrition knowledge tools on the key knowledge indicators.

# **MEASURES TAKEN AND ADJUSTMENTS PROPOSED**

Describe action taken to address challenges/bottlenecks

Provide an update on your theory of change if this is part of the adjustments proposed

MAX 1500 characters

* To adjust to security situation, we work with local partners and identify the field locations based on due diligence. However it does affect the field work and restrict researchers movement in the field.
* Integrating complementary scientific approaches, including the social and economic scientific domains, sectors’ knowledge and perceptions on C&I of FS sustainability
* Promoting and validating tools for ex-ante assessments that include scales beyond the farm
* Assessments considering nutrition knowledge baseline

# **PARTNESHIPS: ACHIEVEMENT AND CHALLENGES**

Please list up to three important partnerships for 2018, using the following table.

|  |  |  |
| --- | --- | --- |
| **Brief description of partnership aims (30 words)** | **List of key partners in partnership (one or more partners). Do not use acronyms.**  | **Main area of partnership (may choose multiple),** **Research/Delivery/Policy/Capacity Development/Other, please specify**  |
| 1. collaborative work on SI framework and sustainability assessment 2. Systems modelling and capacity building through workshops3. Contextualizing research, capacity building, linking with farmer communities | ICRISAT, ICARDA, Wageningen University, Swedish University of Agricultrual SciencesCommonwealth Scientific and Industrial Research Organization (CSIRO)National agricultural research institutes (NARS) in Burkina Faso (INERA), Mali (IER), Niger (INRAN), India (ICAR), Tunisia, Syria and Sudan | Research Research and Capacity developmentResearch and Capacity development |

Please include collaborations with one or more CRPs or Platforms – or in some cases with other Centers, if these are not already core partners for your CRP.

|  |  |  |
| --- | --- | --- |
| **Name(s) of collaborating CRP(s), Platform(s) or Center(s)** | **Brief description of the collaboration**  | **Optional: Value added, in a few words**e.g. scientific or efficiency benefits |
| Interactions initiated with CRP-RTB, CRP-Maize and CRP-Wheat | Identify criteria and indicators and assessing sustainability across farming systems/ regions | Target to combine farm-level models with agent-based models to assess tradeoffs and synergies across scales from farm performance and household livelihoods to landscape or community level benefits. |

# **FUND RAISING**

Give a narrative summary on the financial status and health of the cluster (all windows).

Provide an update on fund raising efforts.

MAX 1500 characters

Besides initially mapped projects, some new funding was leveraged through the following bilateral projects:

* Funds were secured from AgriFoSe (Swedish funding) with aim to conduct a literature review on SI indicators for smallholder agriculture in sub-Saharan Africa, and apply our adapted SI framework to a case study to assess the effects of SI interventions in multiple SI dimensions
* Pierre Chopin (Postdoc at SLU) will conduct the work in 2019, with input from the GLDC team (Shalander, Katrien, Sigrun).
* Bilateral project TIGRESS support for nutritional messaging work of the cluster
* In 2018, funds were secured from McKnight Foundation for a collaborative project in Burkina Faso (CIRAD, INERA, WUR, AMSP) on “Feeding the soil and the animals to feed the people (3F)”, with co-financing from WUR for one West-African PhD student.
* Funds were secured by Prof. Ken Giller (WUR) from the Senior Expert Programme of NWO (Dutch Science funding organization) to contribute to the SI indicator framework activities (for example for a joint workshop).
* Funding from LYSA (French Space Agency) and RAMSES2 (UE-Leap Agrin)

# Overall the financial health is good. We are making efforts to develop greater collaboration with large civil society organizations and private sector to leverage CRP funds for big impacts.