# **Cluster of Activities Report Template**

# **Annex 2 – Flagship Report Template**

**Flagship annual report - 2018**

**FP3 – Integrated farm and household management**

Authors: Bayala Jules (ICRAF-ML), Shalander Kumar (ICRISAT-IN), Katrien Descheemaeker (WUR), Tamo Manuele (IITA-Benin), Julie Dusserre (CIRAD), Boahen Steve (IITA), Sigrun Dahlin (SLU)

# Progress by flagship

[Please provide brief summary narratives about how each individual CRP Flagship progressed towards the agreed ‘Program outcomes’, introducing Milestones Table to the reader, highlighting (i) major pieces of work and innovations and (ii) any major course corrections. Where relevant, indicate cross-flagship linkages and how one FP built on or worked with another to get results. (max 800 words).

In CoA3.1., to reach the planned outcome of enhancing soil-crop-water and nutrient interactions and its associated milestone of improving the efficiency of nutrients and water as well as organic materials (woody litter, composted urban wastes) used alone or in combination with mineral fertilizers on sole crops (sorghum, millet, cowpea and peanut) or their combinations were tested in Burkina Faso and Senegal. The findings revealed an increased soil carbon stock, millet yield, NPK fertilizer efficiency, performance of millet/cowpea association and millet/peanut rotation which might all result from an improved nutrients and water efficiency. This cluster of activities also addressed the issue of biotic stresses through reducing agro-chemical inputs in controlling pest and diseases by tailoring their management components according to the regions. This work covers West Africa and South Asia and includes testing the efficiency of plant extracts, parasitoids, fungicides, genetics for both varieties and pathogens and finally assessing changes in disease incidence in link with climate change. In West Africa, plant extracts application led to emergence of *Striga hermonthica* and increase yield of sorghum. Eight cowpea varieties are being screened using the same method. Biocontrol by releasing parasitoids for cowpea pod borer in Benin and Burkina Faso induced very low populations of the parasite. In South Asia, climate variability was found to be affecting the incidence of disease in pigeonpea (1975 to 2017) and chickpea (1972-2017). Primers for the LAMP assay were designed from the ITS and EF-1α gene of the chickpea pathogens *R. bataticola* and *F. oxysporum* respectively. For each pathogen a set of 6 primers comprising 2 outer, 2 inner and 2 loop primers were designed.

In the attempt of CoA3.2 to sustainably intensify and diversify the cropping systems, a network of participatory field trials under smallholder (less than 1 ha) conditions across various livelihood contexts were established from which at least two options per site per country were to be jointly validated by the local communities and the researchers. The tested crop production systems included:

* Intercropping systems for maize and cowpea in combination with N application, groundnut and pigeon pea. Land equivalent ratios (LERs) of all intercrop combinations were greater than unity indicating more efficient and productive use of environmental resources by intercrops. The economic returns and benefit-cost ratios were greater for intercrops than either sole crop.
* Rotations of maize-soybean and maize-cowpea which led to an increase yield compared to maize-maize.
* Screening of indigenous Bradyrhizobial strains on soybean with the selection of three of them that displayed similar or better impact on grain yield in comparison with commercial strains. This was concurrently done with capacity development activity on AMF production was conducted involving seven MSc and one PhD students, 3 technicians, one professor, extension agents, and farmers.
* Developing mixed legume tree-*Chloris gayana* agro-pastoral that improved the nutritional value by increasing the crude protein content from 8.4% to 16.1-19.8%.

Besides the field testing, a set of activities were also implemented to develop decision support tools on:

* Distinguishing awareness from perception in climate change adaptation for policy design.
* Assessing productivities, resources use efficiency, and sustainability of GLDC-based smallholder systems.
* A methodological approach for innovation adoption analysis so-called ‘ALS typology-based adoption analysis’.
* Designing questionnaires for surveys on farm-household livelihood typologies, innovation adoptions, impacts of legume-based technological interventions on smallholder production and livelihood performance (yet gender-responsive).

To capacitate farmers in applying tested, adapted and validated options for sustainable intensification and livelihood diversification, CoA 3.3 attempted to determine portfolios of household activities, enterprises and management practices that materially and equitably enhance livelihoods (as defined at sub- IDO level) while minimizing negative externalities. This was done through assessing the impact of such portfolios across scales and dimensions, evaluating the trade-offs, co-designing farming systems for enhanced resilience and income and finally by generating the information and knowledge for targeting gender and nutrition under GLDC farming systems.

Forco-developed livelihood options to generate the expected change/improvement, a set of activities were devoted to identifying the right criteria/indicators to be used in any impact assessment activity. Therefore,sustainable intensification (SI) criteria and indicators and frameworks were reviewed. Actions also attempted to improve the interface among farmers, agricultural extensions and national agricultural research for greater awareness on sustainability dimensions and complementary approaches. Additional results include coping strategies for both biotic and abiotic stresses, doses of various compost vs mineral fertilizers for better production and nutritional quality of sorghum/millet grain and fodder. CoA3.3 activities also included modelling frameworks (crop modelling, and whole farm bio-economic modelling) to evaluate the trade-offs and co-design farming systems for enhanced resilience and income. Cropping system modelling tools were assessed/validated to integrate them into the breeding programs as a decision-making support tool on optimization of GxExM for target population of environments. Field testing of co-designed improved farm systems is going-on with Malian farmers about integrated crop, composting and animal feeding.

# Variance from Planned Program for this year

(a) Have any promising research areas been significantly expanded? If so, for each example, please explain clearly where the demand came from (promising research results, demand from partners etc.). Where has the money for expansion come from? (max. 150 words)

There seems to be a huge demand for identifying criteria for sustainable intensification with parallel initiatives on the same by CRP-RTB, CRP-Maize and CRP-Wheat and interest from. Partners like WUR and SLU. Such interest manifested itself through made available AgriFoSe (Swedish funding) 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. Similarly, funds were secured by Prof. Ken Giller (WUR) from the Senior Expert Program of NWO (Dutch Science funding organization) to contribute to the SI indicator framework activities (for example for a joint workshop).

(b) Have any research lines been dropped or significantly cut back? (Please note that cutting research lines which do not seem to be delivering is seen by Funders and System Organization as a sign of good management, not of failure.) If so, please give specific examples and brief reasons. If funding was reallocated to other work, where did the money go? (max. 150 words)

N/A

(c) Have any Flagships or specific research areas changed direction? If so, please describe how, and the reason. (max. 150 words)

During the launching workshop and FP3 Nairobi meeting 1-2 October 2018, the rationale of the numbering of the clusters of activities (CoAs) was questioned and a different numbering proposed. Participants agreed that CoA3.2 which operates at plot level should be the first cluster and coded CoA3.1 while former CoA3.1 will become CoA3.2.

# PARTNESHIPS: ACHIEVEMENT AND CHALLENGES

### Highlights of External Partnerships

[Please summarize any interesting highlights, value added and points to improve/ learning points from this year (e.g. on private sector partnerships), and make reference to partnerships reported at the cluster level] (max. 150 words)

The partnerships have covered three main areas in 2018:

* Partnership with Soybean Innovation Lab and Syngenta Foundation on soybean varieties testing to identify high-yielding drought and disease tolerant varieties adapted to various agro-ecologies across several African countries including Mozambique
* Partnership to improve farmers’ knowledge and skills in improved crop production practices in Malawi
* Partnerships on research and graduate student training at the Institute for Rural Development at Université Nazi Boni (UNB)
* A collaborative work on sustainable intensification (SI) framework and sustainability assessment which a joint work between ICRISAT, ICARDA, Wageningen University, and Swedish University of Agricultural Sciences;
* Training workshop on Systems modelling and capacity building jointly with Commonwealth Scientific and Industrial Research Organization (CSIRO);
* Contextualizing research, capacity building, linking with farmer communities, national agricultural research institutes (NARS) in Burkina Faso (INERA), Mali (IER), Niger (INRAN), Senegal (ISRA), India (ICAR), Tunisia, Syria and Sudan.

### Cross-CGIAR Partnerships

[Please summarize general points on highlights, value added and points to improve/ learning points from this year and make reference to collaborations reported at the cluster level.] Any points you can include on added value of new structures (e.g. Platforms, CRPs) would be very useful.] (max. 150 words)

Interactions were also initiated with CRP-RTB, CRP-Maize and CRP-Wheat to identify criteria and indicators and assessing sustainability across farming systems/ regions.

# Table 1: MILESTONEs TABLE 2018

Reference to the Milestone table related to this document.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **FP** | **FP outcomes 2022** | **Summary narrative on progress against each FP outcome this year.** | **Milestone** | **2018 milestones status (complete, extended, cancelled or changed)** | **Main reason for changes in status (if not complete)** | **Provide evidence for completed milestones (refer back to means of verification, and link to evidence wherever possible) or explanation for extended, cancelled or changed.** |
| Taken from proposal | Taken from POWB/ proposal | To be filled at reporting | Taken from POWB (to allow for changes) | to be filled at reporting | 1. Research/science - inherent risk in unknown cutting-edge research or science  2. Financial - funding delayed and/or cut  3. Partnership - partners were not able to deliver a key piece on time  4. Internal resources - key staff, infrastructure or equipment was not available at the time needed  5. Weather - for example, drought or heavy rain affecting field trials  6. External environment (political, economic, legal, market) - e.g. conflict, economic/market changes  7. Other, please state: \_\_\_\_\_\_\_ | to be filled at reporting  Max 50 words/milestone |
| FP3 | FP3.O1. Pest and diseases controlled safely and with reduced agro- chemical inputs | Reported work covers West Africa and South Asia and includes testing efficiency of plant extracts, parasitoids, fungicides, genetics for both varieties and pathogens and finally changes in disease incidence in link with climate change. | Pest and diseases management components for the target pests in different regions fine-tuned | Extended | 1, 2, and 6 |  |
| FP3 | FP3.O1. Soil-crop-water and nutrient interactions enhanced | Organic materials (woody litter, composted urban wastes) used alone or in combination with mineral fertilizers on sole crops (sorghum, millet, cowpea and peanut) or their combinations tested and validated in West Africa | Efficiency of nutrients and water improved | Extended | 1, 2, and 6 |  |
| FP3 | FP3.O2. Cropping systems sustainably intensified and diversified |  | Map out areas suitable for crop diversification using GIS. Participatory field trials under smallholder conditions to evaluate the different cropping systems under different environments in different countries for farmers with landholdings less than 1 ha | Extended | 1, 2, and 6 |  |
| FP3 | FP3.O2. Cropping systems sustainably intensified and diversified/ |  | At least two options per site per country to promote diversified, profitable and sustainable crop livestock systems discussed and agreed upon with local communities and researchers | Extended | 1, 2, and 6 |  |
| FP3 | FP3.O3. Tested, adapted and validated options applied for sustainable intensification and livelihood diversification by farmers | Impact assessment across scales and dimensions, Evaluating trade-offs and co-designing farming systems for enhanced resilience and income, Information and knowledge for targeting gender and nutrition under GLDC farming systems | Portfolios of household activities, enterprises and management practices that materially and equitably enhance livelihoods (as defined at sub- IDO level) while minimizing negative externalities. | Extended | 1, 2, and 6 |  |

# Table 2: Evidence on Progress towards SRF targets (Sphere of interest)

Instructions:

Please complete this table with any available high-quality evidence on progress that was published or made available in 2018. Do not hesitate to state, “no new evidence available this year”, in column 2 if necessary, since we are trying to demonstrate evidence gaps and the need for additional funding for this area.

For examples of how this information can be phrased and referenced, please see Annex Table A [here](https://www.cgiar.org/wp/wp-content/uploads/2018/10/CGIAR-2017-Performance-Report-ANNEXES.pdf) in the previous CGIAR Annual Performance Report. Please provide information on all relevant SRF targets for a single study or innovation, to the extent possible. Example: please see in the 2017 report Annex Table A how findings from a single rice review have been allocated between targets for adoption, poverty and yield increases. Insofar as possible, please also disaggregate the effect of different innovations (e.g. in the above example NERICA rice could potentially be separated from another group of CGIAR rice varieties).

If the adoption or impact data comes from a relevant innovation or contribution of the CGIAR prior to the CRP start-up (e.g. varieties released before the CRP start-up, which for most CRPs would be approximately 2012), then please support statements with published references, as shown in the 2017 Annual Report Annex Table A above. Nearly all adoption or impact studies fall into the above category. There are (as yet) a few cases (two in 2017) in which the estimated figures for at-scale adoption or impact result from an innovation released within the CRP period, for example some biofortification numbers in 2017. If this is the case, then the statement must be supported by a link to an Outcome/ Impact Case Report **Maturity Level 3** (or if not, with unique identifier from any appropriate repository or publisher website).

|  |  |  |
| --- | --- | --- |
| **SLO Target (2022)** | **Brief summary of new evidence of CGIAR contribution**  [Put N/A if the specific SRF target is not applicable to your FP. Put “No new evidence in 2018” if the target is potentially relevant, but there is no new evidence available**.** *Spell out all acronyms.]*  *Maximum 150 words per entry.* | **Expected additional contribution before end of 2022** (if not already fully covered).  ***Optional narrative. Evidence not required.***  *Max. 100 words* |
| **1.1.** 100 million more farm households have adopted improved varieties, breeds, trees, and/or management practices | No new evidence available this year |  |
| **1.2.** 30 million people, of which 50% are women, assisted to exit poverty | No new evidence available this year |  |
| **2.1.** Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year | No new evidence available this year |  |
| **2.2.** 30 million more people, of which 50% are women, meeting minimum dietary energy requirements | No new evidence available this year |  |
| **2.3.** 150 million more people, of which 50% are women, without deficiencies in one or more essential micronutrients | No new evidence available this year |  |
| **3.1.** 5% increase in water and nutrient efficiency in agroecosystems | No new evidence available this year |  |
| **3.2.** Reduction in ‘agriculturally’-related greenhouse gas emissions by 5% | No new evidence available this year |  |
| **3.3.** 55 M ha degraded land area restored | No new evidence available this year |  |
| **3.4.** 2.5 M ha forest saved from deforestation | No new evidence available this year |  |

# Table 3: Condensed list of policy contributions in this reporting year (Sphere of Influence)

[Please list policy contributions here. (Please see the [indicator guidance](https://drive.google.com/file/d/1GYLsseeZOOXF9zXNtpUtE1xeh2gx3Vw2/view) for indicator #I1 number of policies which also includes an explanation of what is covered under the term ‘policy’.)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column 1** | Type | Whose policy is this? | Geo Scope | Column 2 | Column 3 | Column 4a | Column 4b | Column 4c | Column 4d | Column 4e |
| Name and description of policy, legal instrument, investment or curriculum to which CGIAR contributed (20-50 words, ideally around 30 words)  *Spell out acronyms in every row* | Define if a) Policy or Strategy, b) Legal Instrument, c) Budget or Investment d) curriculum | Specify if a) Funder, b) Public sector; c) Private Sector, d) Other……. | Specify if Global ,Regional Multi-National, National or sub-National | Level of Maturity | Link to sub-IDOs (max. 2) | CGIAR cross-cutting marker score | | | | Link to OICR (obligatory if Level of Maturity is 2 or 3) or link to evidence (e.g. PDF generated from MIS) |
|  |  |  | gender | youth | capdev | Climate Change |  |
| Modules of AMF inoculum use, and production have been incorporated into the curriculum at Makerere University, Uganda | Curriculum | Public | National | 1 | National partners and beneficiaries enabled | 1 | 2 | 2 | 0 |  |

# Table 4: Condensed list of innovations by stage for this reporting year

Please complete the table below and report the supporting document in MEL unless you have already an external link to be provided.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Title of innovation** | **Weblink** | **Innovation Type** | **Stage of innovation** | **Geographic scope (with location)** |
| Please see indicator guidance for details |  | e.g. genetic, | e.g. | e.g. global, regional- West Africa, national- Philippines |
| Multi-model systems analysis was used to i*dentify Low Emissions Development Pathways – exploring synergies and trade-offs in Mahbubnagar District, Telangana, India* | https://mel.cgiar.org/preplanning/relatedfiles/id/480/entity/actionsite | Model | Completed | India |
| 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> | Methods | Completed | Global |

Table 5: List of Outcome Cases submitted by CoA Leaders

|  |  |
| --- | --- |
| **Outcome Case** | **Evidence** |
| Title | Please add the MEL Link if the Case was submitted in MEL In case not submitted in MEL please upload together with this Report. |
| No outcome yet |  |