

Background Resource: ISPC and Funder Assessments of GLDC

Purpose

This document sets out the following as a Background Resources to inform discussions on the System Management Board's recommendation for an agri-food systems research program on dryland cereals and grain legumes for selected dryland agroecology of South Asia and Sub-Saharan Africa. This resource comprises the following:

Item	Description	Page range
1	<p>A covering letter from the Chair of the ISPC dated 23 October 2017*, outlining the review process.</p> <p><i>(* Note: The letter also describes the review process for resubmitted 5 flagship programs that were accepted as elements of the 2017-2022 portfolio, but were not accepted for W1/2 funding in 2018. Discussion on those 5 flagships will take place under Agenda Item 9 (2018 funding allocations), and ISPC and donor-perspective assessments of these are provided as a background resource on Agenda item 9).</i></p>	2-3
2	<p>Assessment of the Grain Legumes and Dryland Cereals Agri-food Systems proposal submitted in early August 2017, for the period 2018-2022, including ISPC assessment and Synthesis of donor-perspective reviews.</p>	4-28

Note: Page numbering referred to follows numbering in the bottom-center of each page.

Action Requested

These materials are provided for background information only.

Document category: Working document of the System Council

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Cover note prepared by: System Management Office

Resources prepared by: ISPC



23 October 2017

Elwyn Grainger-Jones
Executive Director,
CGIAR System Organization

Dear Elwyn

SC5: COLLATED (ISPC & DONOR) ASSESSMENTS OF RESUBMITTED GLDC AND 5 FPs

To facilitate the System Council review process for the resubmitted FPs and the GLDC CRP, I am sending you a pdf for each resubmission which includes both the ISPC assessments and (where available) the reviews by representatives of donor agencies nominated by SIMEC. For GLDC we received reviews from 4 donor representatives, while for the FPs we received reviews from 1 donor each for FTA, Livestock FP3 and Livestock FP5, but no donor reviews for Fish FP2 and WLE FP5.

The assessments have not changed since we submitted them on September 20th (through you) to the SMB. At the SMB meeting there appeared to be a lack of understanding of the rationale underlying our reviews and hence I am providing more detail in this cover letter to remind SC members of the rationale we used during 2016

The rationale for ISPC assessments at FP level: Our assessments for both the full CRP and the 5 FPs were conducted according to the same criteria as we used one year ago (as published in the Consortium “*Final Guidance for Full Proposals*”). The ISPC collectively assigned each FP a rating of ‘Strong’, ‘Moderate’ or ‘Weak’ to draw distinctions between the strengths of the different proposals, with respect to our interpretation of SC priorities for W1/2 funding. Each FP had already secured W3/bilateral funding indicating that that research has met donor criteria for bilateral funding: we considered that we were being asked to comment on the merits of the different proposal’s potential for delivery of international public goods. We based our assessment of this on our assessments of the individual criteria: strategic relevance and theory of change; scientific quality and comparative advantage. At SC3, funding decisions only differentiated between a ranking of “weak” vs “strong and moderate” reached after Council discussion of both the ISPC and FEWG assessments (although later minor funding adjustments were made using ISPC criteria of “moderate”). The SC took the decision not to award W1/2 funding to 5 of the FPs - ISPC only gave advice on relative strengths not on whether funding should be withheld.

2017 FP assessments: In 2016, four of the resubmitted FPs were assessed as ‘Weak’ by the ISPC and of these, Livestock FP5 and FTA have improved considerably and are now rated as ‘Strong’. WLE FP5 has also been strengthened but our reservations leave its rating as ‘Moderate’. Livestock FP3 remains with a ‘Weak’ rating from ISPC, although we do recognize that the proposal has been strengthened in some aspects. Fish FP2 was rated as ‘Strong’ by the ISPC in 2016 and has retained that rating. The only significant divergence between ISPC and donor rating this year is for FP3 and we assume that as in 2016, the decision on funding should take both reviews into account.

GLDC: In the case of the assessment of the resubmitted GLDC proposal, the ISPC review process drew on insights from 2 external reviewers, with the process followed, including the criteria used, being the

same as for our assessments of the 11 CRPs which were approved for funding in 2016. The rating at CRP level (agreed by the ISPC as a whole) was a B+. As defined below this reflects “*a sound research proposal...*” And places it in the same category as awarded to Fish, Livestock and FTA CRPs in 2016.

We used the same rationale as outlined above for the resubmitted FPs, for rating the GLDC FPs. One Flagship (FP 2) was rated as “Weak”, 3 (FPs 1, 3 and 5) were rated as “Moderate” and 1 (FP 4) was rated as “Strong”. ...At FP level the donor reviews did not include explicit scores. The narratives of the donor reviews submitted noted that FP2 has a high potential for impact but one raised concerns around organizational buy-in from implementing partners. The comparative advantage of CGIAR in this area was also raised as a concern, suggesting the equivalent of a moderate rating for this FP.

Kind regards



Margaret Gill
Chair of the ISPC

Definitions of ISPC CRP level assessments

A+: Outstanding - of the highest quality, at the forefront of research in the field (fully evolved, exceeds expectations; recommended unconditionally).

A: Excellent – high quality research and a strongly compelling proposal that is at an advanced stage of evolution as a CRP, with strong leadership which can be relied on to continue making improvements.

A-: Very good – a sound and compelling proposal displaying high quality research and drawing on established areas of strength, which could benefit from a more forward-looking vision.

B+: Good – a sound research proposal but one which is largely framed by ‘business as usual’ and is deficient in some key aspects of a CRP that can contribute to System-wide SLOs.

B: Fair – Elements of a sound proposal but has one or more serious flaws rendering it uncompetitive; not recommended without significant change.

C: Unsatisfactory – Does not make an effective case for the significance or quality of the proposed research.

ISPC Assessment of the Grain Legumes and Dryland Cereals Agri-food Systems CRP-II revised proposal (2017-2022)

ISPC CRP RATING¹ (September 2017): B+

Background

The ISPC commentaries on the first drafts of the GLDC proposal (July 2016; September 2016) highlighted five main concerns that needed to be addressed in subsequent revisions. The concerns were:

- clarifying the target domain of the CRP to better distinguish between the competing narratives of the multi-commodity improvement approach and the agro-ecosystem/farming systems approach,
- establishing a clear set of research priorities,
- developing a sequencing and feedback strategy among the flagships,
- identifying and justifying essential trait discovery and breeding targets, and
- demonstrating commitment to cross-system exchange of knowledge and experience on working with the seed sector.

Due to the difficulties experienced by the proponents of GLDC to adequately address the recommendations of the ISPC, the System Management Board (SMB) commissioned an Expert Panel to reconsider the scientific basis of the proposal and to provide recommendations to address the research for development needs for the crops and communities of the dryland ecosystems. The Expert Panel Report (March 2017) made a number of key recommendations that needed to be addressed in a revised proposal. These included the need to i) provide a convincing argument on the complementarities between cereals and legumes, ii) generate additional analyses and wider consultations to support the arguments and justifications made, iii) provide clearer problem statements for FP1 and FP2, iv) clarify how development outcomes will reach beyond farmers, v) offer a better synthesis of lessons learned, and vi) put greater emphasis on supporting national priorities that will drive change in agri-food systems.

Most importantly, the Expert Panel Report recommended that the geographical focus of GLDC should be narrowed to include only semi-arid and sub-humid systems in South Asia (SA) and sub-Saharan Africa (SSA). It further recommended that ICRISAT should lead the new proposal. The SMB accepted these recommendations and ICRISAT was invited to develop a revised and refocused proposal which was submitted in August 2017.

Summary

The revised GLDC proposal has made satisfactory progress in addressing issues raised by the ISPC and the Expert Panel. ICRISAT commissioned 10 expert studies which provided very useful input into the revised proposal in many areas including a synthesis of lessons learned and complementarities between legumes and cereals; a greater emphasis in places on supporting national and regional priorities through stakeholder consultations; and the need to clarify how development outcomes will reach beyond farmers.

¹ A+: Outstanding - of the highest quality, at the forefront of research in the field (fully evolved, exceeds expectations; recommended unconditionally).

A: Excellent – high quality research and a strongly compelling proposal that is at an advanced stage of evolution as a CRP, with strong leadership which can be relied on to continue making improvements.

A-: Very good – a sound and compelling proposal displaying high quality research and drawing on established areas of strength, which could benefit from a more forward-looking vision.

B+: Good – a sound research proposal but one which is largely framed by ‘business as usual’ and is deficient in some key aspects of a CRP that can contribute to System-wide SLOs.

B: Fair – Elements of a sound proposal but has one or more serious flaws rendering it uncompetitive; not recommended without significant change.

C: Unsatisfactory – Does not make an effective case for the significance or quality of the proposed research.

GLDC is now a sound proposal with a revised focus on the semi-arid and sub-humid agro-ecologies of SSA and SA. However, the ISPC identifies the following as issues that affect the overall rating of the CRP proposal:

- The goals of the CRP remain generally aspirational, as GDLC proposes to help in “transforming agri-food systems”. While the overall logic is reasonable, the proposal is still lacking a coherent argument on how the individual research components and flagships will collectively add up to a transformative process.
- Most FPs are reasonably well-written and present supporting arguments for the research planned. FP4 scored as strong, and FP1, FP3 and FP5 are rated as moderate due to outstanding issues that have yet to be resolved. However, FP2 is judged to be weak. In addition, there is a pervasive lack of clarity on how all of the stated objectives will be achieved, who the partners, outside of other CRPs, will be, and how the planned activities will be funded owing to the substantial funding gap of US\$ 260.1 million.
- Given the importance and complexity of the GLDC CRP, ISPC considers that the role of the CRP Director cannot be adequately met with just 20% of the time of the ICRISAT DDG-Research. Success will demand strong and dedicated leadership, and cost-savings should not be used as a criterion alone.
- A weakness of the current proposal is the lack of clarity on what is likely to be achieved with the available funding – at least for 2018-2019 where agreed W3 and bilateral funding is known, and what constitutes additional aspirations if further funding is secured.

Taking into consideration all of these factors, the ISPC has rated this proposal as a B+.

Overall analysis of the full proposal as an integral part of the CRP portfolio

Strategic relevance

GLDC aims to increase the productivity, profitability, resilience, and marketability of critical and nutritious grain legumes (chickpea, cowpea, pigeonpea, groundnut, lentil, soybean) and cereals (sorghum, pearl millet, finger millet) grown within the semi-arid and sub-humid dryland agro-ecologies of SSA and SA. Studies on poverty and malnutrition as well as climate change and soil degradation have shown this agro-ecological and geographical focus to be well-justified. The strategic relevance of this CGIAR Research Program (CRP) proposal is generally well articulated.

Crop improvement and management, as well as marketing and innovation systems, are integrated in the revised proposal, which enhances its potential to achieve impact. However, the goals of the CRP remain largely aspirational, as GDLC proposes to help in “transforming agri-food systems”. While the overall logic is reasonable, the proposal still lacks a coherent argument on how the individual research components will collectively add up to a transformative process. Impact pathways range from improving nutrition through farmer’s own consumption of improved varieties, to improving income through participation in value chains. However, the activities to support these and other pathways have not been adequately linked to the prioritization process. As a result, it is still unclear what the main thrust of the CRP will be. Numerous assumptions are made, e.g., ‘*we will focus on places where most malnourished people are, and since GLDC crops are nutritious, malnutrition will fall.*’ Given that the first two propositions have always been true, it is unclear how the third proposition would hold true, assuming there has already been ongoing work on these crops for these areas.

The effectiveness of the proposed approach will depend on winning buy-in not only from GLDC scientists and partners, but also from development partners who will be essential to achieving the envisioned level of scaling both up and out. This is somewhat risky; if scale-out partners are not interested in integrating the prioritized commodity improvement products into their value chains, then the impact of GLDC will be compromised. GLDC will need to be very proactive in partnering with and convincing their scale-out partners.

The crop × trait × country priority list (Table 4) would have made the argument regarding the complementarities between legumes and cereals more convincing if the list had included cereal × legume

combinations by country. In other words, in which countries will the cereal and legume synergies be most realized and for what specific traits?

Consideration of the 'grand challenges'

The proposal considers a number of societal grand challenges e.g., climate change, malnutrition, soil degradation, competition for land, post-harvest losses, ageing and changing workforce. In general, the assertions made are standard for CRPs. The commissioned expert studies have contributed to strengthen the arguments put forward. Each flagship also has an informative section on the specific grand challenges their research is targeting. What is possibly missing, for instance in the case of malnutrition, is a clear logic and articulation of how the presence of nutritious crops in places where nutrient needs are highest will lead to a transformation in the future, when their past presence has not, as per lessons learnt from previous research-for-development undertakings by CGIAR and its partners. While malnutrition is dealt with in a number of places, micronutrient deficiencies do not appear as high priority in the list presented in Table 4.

Evidence of capturing inter-CRP synergies

Although the three CRPs that were merged to form GLDC had already developed cross-CRP collaboration during Phase 1, changes in emphasis and activities in the revised proposal necessitate new or expanded collaborations with other CRPs. This will be done in an environment where other CRPs have already been working in Phase 2 for a year (by 2018) and may not have the staff and resources available to develop new collaborations with GLDC. Much of the collaboration planned with other CRPs is on crop-specific work

Rigor and credibility of the scientific arguments

GLDC aims at integrating existing capacity in crop improvement science, farming systems research and social science with R4D that fosters wider market and policy opportunities within the targeted agri-food systems. The redesign of the CRP has placed the multi-commodity improvement approach into an innovations systems/value chain system approach. The argument for the redesign is logical with more information provided on the kind of opportunities that will be selected in value chains and the kind of research that may be carried out. These research areas include production and post-production technology applications, business models, post-harvest infrastructure, value chains, social norms and organization, partnerships, benefit-sharing agreements, governance and institutional arrangements, and organizational and public policy options.

The 'response to reviewers' clearly spells out the degree to which CGIAR partners tried to address ISPC comments, including the commissioning of 10 papers, and much improved theoretical analysis of problems. It relies a great deal on site coordination, shared infrastructure as the vehicle for research synergy, and multiple uses of crops (food-fodder, for example). The science quality has improved, as well as attention to the need for understanding policy environments, how to scale up impacts (science of scaling), and the need to integrate socioeconomic perspectives into all facets of an agri-food system CRP. Some of the aspirational targets cited are very optimistic and based on little serious analysis. The demand projections are based on the IMPACT model and show increasing demand for all GLDC commodities, even though past trends suggest a decline in the importance of some of these crops in target countries.

As the proponents noted (page 4 of the proposal) "*the CRP's value proposition is based on a rationale of logical synergies between sorghum, millets and the grain legumes grown in common agroecologies.*" However, it is unclear where and who grows soybean or lentils with sorghum and millets. The total cumulative share of the economic importance of finger millet, lentil and soybean (page 7) is reported to account only for 6.4% of the share value of production, suggesting relatively minor potential impact of investments for research on these three crops across the 14 target countries. In addition, the past history of adoption is weak and the proposal is unable to come up with many examples of success, outside of India, that would make the case for these crops as potential drivers of rural transformation.

Individual FPs add up to a CRP that offers more value than the sum of individual FPs

In general, the level of integration described in the narratives of the FPs and the reference to knowledge flows and collaboration suggests that the FPs will add up to a CRP that offers more value than the sum of the individual FPs. However, the information flows in Figure 5 (page 14) are confusing and do not fit

with the narrative. FP2 is intended to be central to most decisions that are made in the rest of GLDC. It feeds information about opportunities to FP1 and FP4 but seemingly not to FP5 although this is mentioned in the narrative. Information flow is from FP3 to FP2 but not *vice versa*. This does not fit with the narrative that indicates that information will flow from FP2 to FP3 and to FP5. In addition, as FP2 will identify opportunities for priorities and feed these to FP3, FP4 and FP5 then two FPs will be involved in identifying opportunities. Figure 6 on the program structure and flows of information (page 19) is not of much help as it shows that information flows both ways between all connections. There is still a need for a rethink on which information flows actually drive decision making in GLDC. These figures do not meet ISPC recommendation for clarity on the sequencing and feedback of information among the FPs.

Identifying potential synergies between FPs is only the first step in the planning exercise. The real challenge will be to make sure that the synergies are effectively achieved in practice. While the management and organizational structure has sufficient scope to maximize cooperation, the only way to judge the cross-FP linkages will be implementation.

Lessons learned

Each FP narrative has a section on lessons learned from past research and how activities and targets will be revised to address deficiencies and solve problems. For example, in addressing lack of adoption of some improved cultivars, FP1 will look at both poorly functioning seed systems as well as attributes preferred by farmers and consumers. FP2 will take advantage of a renewed emphasis on nutritional security to focus on new opportunities for smallholders to produce nutritionally dense GLDC crops. FP4 has learned that a combination of formal and informal seed systems is needed for GLDC crops.

The commissioned paper on “*Past performance and lessons learned*” (Orr et al, 2017a) provides an excellent assessment of technologies that were successful and why, as well as some that failed. The overriding reason for success seems to be based on the existence or fostering of functional markets and institutions and a conducive policy environment. This is a critical message for GLDC for the research that needs to be carried out in Phase 2. This effort responds to the Expert Panel recommendation to provide a better synthesis of lessons learned. ICRISAT has also provided a comprehensive response to the recommendations made on various versions of GLDC by the ISPC, Expert Panel and the Fund Effectiveness Working Group.

There are few lessons presented on aspects other than trait breeding (landrace trait sourcing, participatory plant breeding, dual-purpose crops, early cultivars, gender-responsive plant breeding). Examples of lessons learnt on agronomic research or markets-institutions-policy are scanty. This could be partly justified by the fact that most previous work was not in that domain, but one could also expect to see lessons learned related to that lack to be highlighted.

Site integration

The new proposal does a better job of articulating why site integration matters to issues of integration at a food system level. Table 2 (Annex 3.7) lists CRP × activity × country for GLDC’s site integration with other CRPs. The information given indicates that some of these site integration activities are continued from Phase 1, e.g. for PIM, CCAFS, LIVESTOCK, and A4NH. Tables 1 and 2 indicate a serious commitment to site integration for the benefit of CRPs and their partners. Although missing from the narrative on inter-CRP collaboration, the Tables list several activities that will be undertaken between GLDC and FTA including developing improved varieties for tree-based systems and modelling impacts of tree-based options for land restoration and intensification. It is not clear why collaboration is only planned on nutrition research with CRP on Agriculture for Nutrition and Health (A4NH) in India, when there ought to be collaboration on nutrition, value chains, etc. The same could be said for the restriction of site integration with PIM in Ethiopia.

1. Theory of Change and Impact Pathway

The main concern of the ISPC on the original GLDC proposal (ISPC, 2016) was that the Theory of Change (ToC) was too generic. It did not reflect the specificities of drylands, avoided engaging with the complexity of how this CRP will achieve impact, and there was inadequate discussion of the differing roles played by the crops in different locations and contexts. In the revised ToC, GLDC argues that “*household-level outcomes of food security, resilience and poverty reduction depend on the ability of*

smallholder farmers and other actors to tackle system-level change in agri-food system regimes.” However, institutional, market, policy and governance problems often prevent changes that can result in improvements in agri-food systems that benefit small holders. Hence “*socio-economic science, contemporary development practice and scaling partners must be well integrated within GLDC to unlock opportunities in the context of their differing innovation capacities and agri-food system regimes”*.”

In principle, no one would disagree with the logic of this ToC. However, the key question is to what extent this CRP will be able to effectively tackle the problems with contemporary development practices and engage convincingly with scaling partners that result in the transformation and sustainability of GLDC agri-food systems. The ToC has little articulation of what research will lead to what impacts via what mechanisms. It acknowledges that crop improvement and farming systems research are necessary but not sufficient investments for smallholders to overcome their challenges. There is still confusion over whether the grain legume and dryland cereal commodities are being cultivated primarily for home consumption (which motivates arguments about nutrition) or whether they are being cultivated for market sales and income generation. It seems somewhat implausible that these are the crops that will drive a rural transformation in the target areas. It also seems too vague to serve as a valid basis for prioritization of research to generate evidence to understand and support key links in the impact pathway

Figure 5 (page 14) shows the Impact Pathway of GLDC. There are two impact pathways, namely, the Integrative solutions pathway and the Scaling and sustaining pathway. Is there a need for having two impact pathways in GLDC? FP1, 3, 4 and 5 make most contributions to the Integrative solutions pathway while FP2 makes most contribution to the Scaling and sustaining pathway based on the outcomes of the Integrative solutions pathway. While it is important to acknowledge that achieving CRP targets will require change well beyond the project target sites and countries, the way the pathways are presented in Figure 5 suggests that the capacity development outcomes described in Pathway 2 are not present or important in Pathway 1. This is not the case, and is another reflection of the lack of real integration of FP2 with the rest of the CRP. Although it is clear that the Expert Panel’s recommendation to clarify how development outcomes will reach beyond farmers has been taken seriously by GLDC, there remain questions about how far GLDC can be involved effectively in the process beyond scaling-up and –out (via Impact Pathway 1). This is also discussed under FP2.

2. Cross-cutting themes

Gender and Youth

GLDC has used the opportunity of Phase 2 to strengthen its focus on gender integration and social exclusion in the drylands. This will be based in “*continued learning and improvement in gender research, analysis, intervention and reporting”*”. FP1 highlights CoA1.3, which is specifically targeted at gender research. The narrative gives a number of specific examples of the planned gender research agenda for each FP and how it is aligned to key issues on the impact pathway. The gender strategy is expanded further in Annex 3.4, and it is clear that gender issues have been considered within the proposed research framework.

In its assessment of the previous GLDC proposal, ISPC expressed concern regarding the narrow focus on youth issues – mainly digital agriculture – without sufficient explanation as to how this would make dryland farming more attractive to youth. The ISPC suggested a need to consider other issues such as child labour, rural processing and youth unemployment. The revised proposal shows that more effort has been made to develop a youth strategy which addresses these issues. This effort has been informed by recent studies on youth in agriculture including one by MAIZE (Ripoll et al., 2017) which developed a framework for addressing youth inclusion in rural transformation. GLDC will focus on “understanding the ‘youth in the drylands’ – who they are, who is staying in agriculture, who is leaving agriculture, who is coming back to agriculture once they have left and the pathways they follow in engaging with dryland agriculture”.

Enabling environment

Considerable attention has been given to the enabling environment in the revised GLDC proposal, especially in terms of the Markets-Institutions-Policy rubric which must be functional if technologies are to be adopted. The importance of the enabling environment features throughout the narratives of FP1 and FP2; it is part of CoA1.4 in FP1 and is also a key outcome (C1-Enabling environment improved in the

impact pathway). However, there has clearly been little substantive discussion with either PIM or A4NH about policy outcomes, potential research topics, tools to use, etc. to get a sense of how to enable transformation in these food system ecologies beyond incremental yield growth.

Capacity development

In its commentaries on the GLDC proposal, the ISPC (2016) expressed some concerns on the lack of capacity of this CRP and its NARES partners to deliver on some of the activities described, especially the research on innovations systems. The expert panel also raised concerns about limited ambition in the vision statement, lack of operational detail, and limited information on the planned levels of investment in capacity development. GLDC has now given much more emphasis to capacity development in the program narrative and the revised Annex 3.3. The CRP plans to form a Capacity Development Task Force of facilitators which will identify opportunities and facilitate the capacity building required especially within the CRP. It will improve the capabilities of GLDC staff and their key partners to implement capacity development. The GLDC shows a clear commitment to capacity development throughout most if not all research activities. This will no doubt contribute to its outputs and outcomes. The amount of capacity development planned is very ambitious and may require significant resources. The planned budget of US\$ 250K seems to be very small for what is required.

3. Budget

In assessing the budget in 2016, the ISPC highlighted the difficulty of this CRP to develop a coherent project portfolio when 90% of its funds were from W3 and bilateral sources. With only 10% from W1/W2, it was considered difficult for the CRP to respond to the ISPC's major concerns, including that it risks becoming donor-driven. In identifying this problem, although the ISPC did not make concrete suggestions to resolve it, it concluded that the intellectual challenges facing this CRP must be addressed simultaneously with a conversation about greater W1/W2 funding through improving donor confidence in its ability to achieve its objectives. The budget breakdown in the revised CRP has slightly improved with 15% of funds from W1/W2. This has only slightly aided GLDC to develop a coherent portfolio especially one based on its priorities if donors have different ones. The funds requested are in line with other CRPs and seem appropriate for the planned activities and expected outcomes. However, the funding gap is substantial at US\$ 260.1 million of the total of US\$ 413 million. There is a funding gap of US\$ 24.7 million (30%) for 2018 alone.

The proportion of funding allocated to some FPs has changed considerably from the 2016 proposal. The percentage of the budget allocated to FP2 and FP3 is more or less the same but the budget of FP1 has decreased from 13.4% to 8.2% and the budget of FP5 has decreased from 15.4% to 10.6%. In contrast, the budget of FP4 has increased from 29.3% to 39.7%. Since this CRP gives high priority to plant breeding, it seems that the balance relates to the expected outcomes. But these changes also probably reflect changes in W3 and bilateral sources but it merits further explanation. Have activities planned previously under FP1 and FP5 been dropped or reduced due to budget shortfalls and in such case, what effect would this have on their ability to achieve expected outcomes?

The budget allocation for CRP management is US\$ 12 million, which is the same level requested in 2016 - but for one year less (in other words an increase in real terms). This means that the percentage of allocation to management has increased from 2.3% to 2.9% despite the fact that the percentage of management time for the program director has decreased from full-time staff to 20%.

4. Leadership and partnership

GLDC will be led by the Deputy-Director General (DDG)-Research of ICRISAT who is an experienced scientist in dryland systems. However, only 20% of his time will be allocated to this role. Most of the daily management will be done by a full-time program manager. The narrative describes this arrangement as cost-effective and that similar arrangements have been established in WHEAT and MAIZE. However, the leadership /management arrangements for these two CRPs do not describe part-time management. GLDC is a much more complex CRP than others, as it is dealing with nine crops, seven CGIAR centres, and has had difficult interactions including the lack of information flow and learning across FPs and regions, as well as limited disciplinary integration (especially with social scientists) and poor linkages across regions. The ISPC considers that the role of the CRP director cannot be adequately met with just

20% of the time of the ICRISAT DDG-Research. Cost-saving should not be used as a criterion alone. Success will demand strong and committed leadership.

In its 2016 commentary, the ISPC noted the need to strengthen socioeconomics, priority setting and impact acceleration in FP1; the need for experienced systems agronomists in FP4; and the need to strengthen marker-aided breeding expertise in FP3. A brief assessment of the proposed leaders of the FPs suggests that only some of these recommendations have been addressed. FP2 is to be led by an international leading expert in innovation systems. The other members of the team include two members from CSIRO who have innovation systems experience but none of the CGIAR staff have innovation systems/value chain experience. The leader of FP1 has expertise in impact assessment but does not appear to have specific experience in priority setting. FP3 is now led by a forest ecophysiologicalist. His team includes a soil microbiologist, an entomologist, a systems modeler, and three members with dryland systems experience although only one in agronomy. Further comments on this are given under FP3 but the ISPC would question whether a forest ecophysiologicalist is the most appropriate leader of this FP when crop-based research under a farming systems approach should be the main focus.

FP4 is led by a groundnut breeder, and his team includes several breeders with phenotyping experience as well as one scientist with experience in community seed systems. The seed systems expertise is substantially strengthened through the inclusion of a specialist with expertise in small holder seed systems however specific experience in working with the private sector is lacking. FP5 is led by a scientist with substantial experience in genomics and trait discovery in a multinational seed company. Several of the team have experience in marker-aided breeding including two scientists from CIRAD.

With possible exception of FP5, the location of the team leaders does not seem to reflect the overall distribution of the scientists under each FP. While there are obviously other factors to be considered in appointing team leaders, this separation of leadership and key scientist might present some coordination challenges. There seems to be a mismatch between the location of scientists and the target countries of GLDC. For six of the target countries, namely Burkina Faso, Mali, Niger, Sudan, Tanzania and Myanmar, there is not a single scientist on the team that is based in those countries. While it is understandable that the partnership has to draw from existing scientists who are best qualified for the job, some country-level representation would be useful to ensure smooth implementation and minimize travel costs. Alternatively, a country-level coordinator might be necessary.

The ISPC commentary on the 2016 proposal complimented GLDC on the identification of partnership typologies for different kinds of activities e.g. discovery, crop improvement and product development and seed scaling however limited effort had been made to identify new partners for innovations systems and value chain activities. The Expert Panel identified the need for wider consultation with partners in the development of the revised and refocused CRP. The donors asked for more evidence of engagement with SROs. It is clear that GLDC has taken these recommendations seriously. GLDC will be implemented through collaboration of seven CGIAR centres, Apex and Sub-Regional Organizations, the NARES in each target country, NGOs, ARIs, Farmer Producer Organizations (FPOs) and private sector companies. A partial list of partners who endorsed the GLDC proposal and agreed to support implementation is provided in Table 7. GLDC priorities have been cross-checked with strategies and priorities from sub-regional organizations (SRO) and regional fora. GLDC sees SROs as instrumental in scaling out benefits from CRP interventions within similar agro-ecological zones to neighboring countries. Many of the partners have shown excellent commitment. For instance, CSIRO and CIRAD/IRD have committed funds and staff time bringing new skills and experience.

GLDC has not explicitly analyzed its comparative advantage with regard to alternative suppliers and relies on the endorsement of the Expert Panel report. That said, the centers collaborating in GLDC have a long history of productive and well-regarded partnerships. This provides it with stature and credibility in attracting new partners who can contribute necessary skills where GLDC does not have comparative advantage, e.g. development NGOs and private agri-businesses. GLDC rightly acknowledges that scaling out innovations depends on forming good partnerships with these groups. Other components of comparative advantage for any CRP include having scientists and facilities located in target countries where the research will be carried out as well as easy access to substantial well-conserved genetic

resources collections. What is probably lacking in this section and in all the FP narratives is an assessment of the scientific comparative advantage versus alternative suppliers.

The governance and management of GLDC follow recommendations of the IEA (April 2014).

5. Flagships

Flagship 1: Priority setting and impact acceleration [Score: Moderate]

This FP will ensure that GLDC research is demand-driven, outcome-focused, inclusive and scalable with high potential for large impact contributing to the SRF and SLOs.

Some of the 10 commissioned studies on *ex ante* impact assessment, foresight analysis, lessons learned and unpacking demand have helped to inform the narrative of this FP. The combination of priority setting and impact evaluation in this FP are intended to accelerate adoption and impacts of GLDC technologies and innovations (Figure 1.2 page 33). The ToC of FP1 is well-articulated and plausible providing the key assumptions listed (page 32) are addressed. Priority setting is long-term and built upon in-depth scientific *ex-ante* impact and foresight analysis, which has already begun. Although FP1 states that it will work closely with FP2, the planned activities suggest there is a danger of overlap with FP2 on scaling-out and priority setting. Most importantly, FP1 will work with FP2 where action research is to be undertaken in specific value chains in collaboration with NGOs and the private sector. However, the value chains are not specified, although most of the funding for research activities is from W3 and bilateral and thus the priority value chains are known.

The pathways from FP outputs to intermediate outcomes to sub-IDs and IDO 1.3 (Increased incomes and employments) are clear. But these ambitions can only be realized with a realistic and explicit plan for how proponents seek to 'transform' these hugely challenging ecosystems. The response to reviewers' notes for FP1 that they commissioned a paper that allowed the authors to create a matrix of country × crop × trait to determine their priorities. What they explicitly did not respond to was ISPC's call for a clear assessment of demand, not just supply. As a result, the prioritization matrix ends up focusing on grain yield gains as the driver of returns to investment in GLDC. Articulation of challenges is not the same as clear understanding of demand patterns going forward.

The bottom of Figure 1.2 shows how the Integrative solutions pathway will feed into the scaling and sustaining pathway which supports the earlier comment that in reality they are two parts of the same impact pathway. Although there is no explicit section on the alignment of activities and outcomes with national and regional priorities and initiatives, the planned engagement with national and regional stakeholders from the beginning to the end of the planned research strongly suggest that their priorities will be well-aligned with those of GLDC.

The section on Lessons learned and unintended consequences is taken from the Orr et al (2017) study on Past performance and lessons learned which shows that the narrative has been informed by this study (see section 1.6 above)

Foresight and *ex ante* analysis for targeting and prioritization and *ex ante* yield impact analysis of promising and alternative GLDC technologies using the methods developed in the Global Futures and Strategic Foresight of PIM will be the main research methods used by this FP. Several specific examples are given of the kind of research to be undertaken such as DNA fingerprinting to track GLDC cultivars in adoption studies. The application of proven approaches seems sound but they are not especially novel having been already used by other programs and initiatives.

As indicated above, the Orr et al (2017) paper has provided examples of lessons learned for FP1. There is evidence of building on previous work and changing approaches but not on any activities being dropped based on past learning. This is relevant as the revised 5-year (2018–2022) budget for FP1 is US\$ 34.1 million compared to US\$ 69.8 million in the 2016 6-year (2017–2022) proposal. The proposal would have been stronger if it had laid out explicitly the activities that were altered from the previous version, and why and whether this will affect the planned outputs and outcomes.

FP1 states that “its partners have long-standing experience working in the targeted agri-food systems and regions”. This is correct and important for the credibility of the CRP and its ability to attract new partners but a more convincing case for the comparative advantage of the CRP in this area would strengthen the proposal. The research agenda as articulated does not spell out how the key research gaps will be filled. The response to reviewers justifies part of its geographic and crop focus based on bilateral priorities; i.e., they argue that bilateral work will indirectly support GLDC to achieve its targets. That raises questions about how well choices will focus on W1/W2 priorities.

Gender issues have been well-considered under CoA 1.3 on Enhancing gender integration and social inclusion in the drylands. The GLDC gender expert is a member of the FP1 team. Research on youth is also a part of CoA 1.3 but there is no mention in the narrative of the proposed research activities. There is also no mention of specific activities in FP1 I in the youth strategy.

The importance of the enabling environment is considered under CoA 1.4, but this might not be sufficient for an agri-food systems CRP (see section 3.2 above).

Capacity development was given considerable emphasis in the introductory part of the narrative. Section 1.10 of FP1 gives a number of examples of the type of capacity development planned with some detail on gender analyses. One would expect more novelty and more information on the type of capacity building required by national innovation systems stakeholders.

The funding gap for FP1 is US\$ 20.1 million – about 60% of the total budget. With such a funding gap, it is not possible to assess whether the funds requested seem appropriate as the expected outcomes are very uncertain.

Flagship 2: Transforming agri-food systems [Score: Weak]

FP2 will strengthen agri-food system mechanisms to respond and adapt to context-specific and evolving needs of women, men and young farmers, value chain and governance actors.

The title, structure and focus of this FP have changed substantially from the 2016 proposal. The focus of the FP is now to be the previous CoA 2.2 on scaling for transforming agri-food systems. The FP issues that are key to the success of the CRP and is led by a highly competent scientists in this field. However the proposal is rather generic and does not adequately integrate specific issues of the GLDC agri-food systems. In addition it is not effectively integrated into the overall CRP design.

The new configuration of FP2 does reduce overlap with FP1 and helps to respond to the Fund Effectiveness Working Group’s concerns about the need for clear problem statements for FP1 and FP2. FP2 will concentrate on off-farm utilization of GLDC crops. However, the focus on off farm utilization is quite narrow and mostly supply driven. The case for public investment is weak and the scope for the generation of international public goods (IPGs) limited. The argument for why better off-farm utilization is important to achieve intended impact is not clearly articulated.. The logic seems to be that it is needed to incentivize adoption of technology by farmers but this contradicts other assertions, such as that market demand is strong and growing for these crops.

FP2’s ToC is articulated through two impact pathways which are actually two parts of a larger impact pathway. Firstly, it argues that if off-farm utilization opportunities are supported through technological, business, market, institutional and policy innovations, the private and public sectors and civil society organizations will be encouraged to invest in them. Secondly, if links between critical market, research, policy and consumer stakeholders can be strengthened, it would increase the collective capacity to drive and govern agri-food system changes that respond to farmers, business and society’s needs and would stimulate research responses that support these changes – ultimately leading to transformed agri-food systems. The ToC seems implausible based on the proposed research, assumptions made, capabilities and track record. The FP contribution to SLOs is not clearly articulated and not obvious, given the IDOs and sub-IDOs selected. A number of assumptions are put forward to underlie the ToC which are highly reliant on convincing stakeholders and partners to take actions which are essential to the success of the FP – but outside the control of GLDC. Hence it implies serious risks. More importantly, the feasibility and

practicalities of creating the enabling conditions and capacities for sustained impact at scale into the future for wider transformational changes in agri-food systems are unknown.

The ISPC is not convinced that this FP will in fact succeed in filling relevant research gaps. The science lacks strong economic or other social science theory or evidence. There are no conceptual frameworks that generate testable hypotheses, and the research questions (starting from the overarching question for the FP; i.e., “*what processes, practices and tools and institutional arrangements unlock crop utilization opportunities and catalyze the transformation of agri-food systems in dryland ecologies?*”) do not seem scientifically testable. The response to reviewers states that “*The work on policy research and value chain development is yet to be selected and depends on opportunities identified by partners*” indicating the FP does not yet have a clear science agenda

The success of FP2 strongly depends on partnerships with organizations which have the mandate and the capacity to implement technological and institutional innovations. These include academic, public, private, civil society and international development organizations. Collaboration with PIM is considered important but no other CRPs are mentioned. There are no clear linkages of FP2 with other AFS CRPs on food system interventions and no mention of A4NH FP1 (food systems for healthier diets, in which they prioritize these same crops) despite obvious synergies.

FP1 and collaboration with PIM will identify the priority opportunities for FP2 – which is desirable. But there is a concern about the lack of an explicit plan for the work of FP2 to signal areas of priority to FP4 and FP5 regarding the crop traits and seed systems opportunities, or identifying those on-farm interventions to be tested. Given the current formulation in the proposal, it is not clear that FP2 could provide meaningful feedback on traits to breeders. It is also unclear whether value chain work will be done mostly under FP1 or FP2, and whether FP2 will produce post-harvest technologies or just models and tools. Further clarity would be needed on the interaction and potential overlap between FP2 and FP1, including consideration of moving some of the FP2 research components into FP1.

It is not possible to judge the relevance of institutional partnership, as it is not yet clear which specific partners will be involved and what exactly those partners will contribute as value-added and enhance the probability of impact in relation to agri-food systems research. . The direct involvement of CSIRO in GLDC does clearly add value to FP2.

The revised budget for FP2 is US\$ 62.8 million compared to US\$ 87.4 million in the 2016 proposal. Considering the reduced timeframe (by one year) the budget is slightly lower at 15.2% of the total compared to 16.7% in the 2016 proposal. CSIRO will contribute US\$ 6.8 million. However, the funding gap is huge at US\$ 40.4 million. With such a funding gap, it is not possible to assess whether the funds requested seem appropriate as the expected outcomes are very uncertain.

Flagship 3: Integrated farm and household management [Score: Moderate]

FP3 will improve the profitability, productivity and sustainability of smallholder farming systems using on-farm and in-household innovation to ensure household nutritional security and enhanced income generation through integrated crop, tree and livestock production systems

This FP research-for-development aims to close yield gaps and to diversify crop production for balanced diets through improved agronomic and animal husbandry practices (sub-IDO 1.4.2). Another goal refers to reducing biotic and abiotic stresses to achieve higher productivity and to provide an opportunity for farmers to reduce the use of pesticides and herbicides and thereby addressing health concerns. It links to grand challenges such as climate variability and change, dryland farming risks or land degradation, among others. FP3 claims to provide “*the platform to translate crop-specific research into tested, farmer-led cropping systems that improve overall system performance to include not only production efficiency but also risk management, resilience, inclusiveness, profitability, acceptability and improved nutrition*”. Addressing issues beyond the farm and household levels will rely on close collaboration with other CRPs, especially WLE, PIM, FTA and CCAFS. The focus on crop-livestock systems is appropriate for sub-humid and semi-arid agro-ecologies where such systems predominate. However, clarity on the livestock research activities is needed. Apart from West Africa, where trees are often part of crop-livestock

systems, there is a question on the importance given to trees vis-à-vis crops and livestock in other regions, especially if they have minimal economic value..

The ToC is well articulated but also very ambitious. The complexities in improving crop livestock systems are substantial even without the additional complexities of crop mixtures, inter-crops and trees. The impact pathway would be feasible providing the assumptions can be validated and system complexities can be addressed. There is no specific reference to alignment of the problems to be addressed and expected outcomes with national and regional SDG priorities.

Participatory approaches will be used to better target interventions on land, water, crop, tree and livestock diversity management via an options × context × farming system performance. Communities of practice will be formed to develop agro-information system standards and best practices. Modelling platforms will be used to better understand temporal and spatial dynamics and therefore trade-offs and risk. This is sound, if not especially novel, science.. There are concerns about the capabilities of the proposed team to address the livestock component of the target crop-livestock systems. The narrative gives emphasis to the importance of improving the yield and quality of stover and halum in sorghum, pearl millet, groundnut and cowpea although these traits are not yet listed as priorities. It does not specify any other livestock interventions in these systems. The potential success of GLDC work on the livestock component of crop-livestock systems will depend on recruiting livestock scientists; rapid development of partnerships with the livestock sections of relevant NARES; and forging closer links with ILRI and inter-CRP activities with LIVESTOCK. The Expert Panel recommended the need to enhance the activities on livestock – and GLDC has not fully responded to this request in the current proposal.

FP3 is led by a tree eco-physiologist; the team include a soil microbiologist, an entomologist, a systems modeler, and three members with dryland systems experience although only one in agronomy.

There is evidence that FP3 has learnt from previous research and is building on findings and successes from Phase 1. These include the need to build stakeholder capacity for valuing the land and the services it provides; the progression from the genotype (G) × environment (E) × management (M) approach to the options × context × farming system performance approach; the scale- and context-specific nature of the portfolios of sustainable farming systems options and their adoption drivers; and the need for innovation platforms linked across flagships to improve communication and knowledge sharing across GLDC.

Although FP3 fills relevant research gaps through the planned research with partners (mostly unspecified) in the target countries, it is not possible to judge if the CGIAR and the leading institute have a comparative advantage in one or more research areas. Comparative advantage is not mentioned in FP3.

Links have been established and collaboration agreed with WLE, PIM, CCAFS and A4NH as well as some of the agri-food systems CRPs and the CGIAR gender network. Other partners will be identified and selected based on identified gaps in competencies and experiences and will include national and local government, regional organizations, NGOs, private companies, farmer and consumer organizations, development agencies and ARIs.

Much of the narrative on gender in this FP is based on that provided under the CRP level gender section, and is not focused on the issues specific to FP3..There is indication the focus will be more on women’s labour and participation. Youth issues are coupled with those of gender, but without any clear strategy articulated.

The only mention of the enabling environment is associated with Table 3.1, which states that FP3 will address “*complementary innovations that are required in an enabling environment to facilitate innovations and adoption at the household and community scales*”. It is unclear what this means or how the FP will engage in building an enabling environment in which the innovations will be developed for adoption. The previous ISPC commentary on GLDC actually called for a better assessment of multiple forms of risk that threaten these specific agroecologies and food systems, and what FP3 would do to address them. The response to reviewers says that “*Mitigating risk is a critical issue for FP3*”, and only talks about risk management in the context of adaptation to climate change.

Although there is a commitment to capacity development, the activities described are generic. There are no details of specific areas of capacity development to planned FP3 research activities.

The revised budget is US\$ 89.5 million compared to US\$ 113.3 million in the 2016 proposal. Considering the reduced timeframe (by one year) the budget is very slightly lower at 21.5% of the total compared to 21.7% in the 2016 proposal. However, the funding gap is significant at US\$ 51.9 million. With such a funding gap, it is not possible to assess whether the funds requested seem appropriate.

Flagship 4: Variety and hybrid development [Score: Strong]

FP4 aims to ensure that high-yielding, nutrient-dense and market-preferred GLDC varieties and hybrids are locally available and utilized by women, men and young farmers and value chain actors.

FP4 is based on the value proposition that “*a pipeline of modern varieties and functional seed delivery systems will enhance agricultural sector growth in developing economies of Africa and Asia*” through inclusive livelihood opportunities for smallholder agriculture and higher productivity, market-oriented products and entrepreneurship. The narrative provides a good understanding of the challenges to achieving the above proposition including climate change; low productivity, profitability and high risks in target agro-ecologies; unlocking pathways to enhancing the nutritive value of GLDC crops; and enhancing opportunities for income generation and employment.

The overall targets are to reduce the yield gap by 30%; pre- and post-harvest losses by at least 10%; and to increase the availability of selected nutrient dense GLDC crop, which should “*enhance the household capacity to cope with environmental shocks and unlock enterprise opportunity especially for formal and informal seed systems and for women and youth*”. The ToC and the described activities seem plausible and are supported by some realistic assumptions, although a reduction of 30% of the grain yield gap is extremely ambitious.

The science is sound, although not any longer new in plant breeding, e.g., high throughput phenotyping, targeting environments, genomic selection, rapid generation turnover, participatory seed innovation or doubled-haploids are already being used for many crops. The proposal does not elaborate on what innovations are brought by engaging in a knowledge-led breeding approach for this CRP’s crops, and how along with seed system interventions they accelerate genetic gains and improve cultivar release pipelines.

The renewed focus on seed systems is welcome. Most importantly, in the past year or so there has been useful analysis of both success stories and failures in seed systems for GLDC crops. A number of seed models have been tested. There has also been identification of the gaps by crop and country. This information is being used to inform the research planned on seed systems in Phase 2. GLDC has made some attempt to address the ISPC’s recommendation for demonstrating commitment to cross-system exchange of knowledge and experience on working with the seed sector but more work would be needed in this area.

Gender issues are specifically addressed through four prioritized activities, which are all particularly relevant to the involvement of women in GLDC crops. The attempt to address youth issues is targeted at agri-business innovations that will attract youth.. Youth issues have not been used to shape the research agenda. There is no reference to the enabling environment. Capacity development in FP4 will focus on breeding capacity and delivery capacity through universities and through short courses and internships to build skill sets.

In contrast to the other FPs, the share of the GLDC budget to FP4 activities has notably increased from 29.3% (US\$ 153.1 million) to 39.7% (US\$ 164.3 million) bearing in mind that the latter budget is for 5 years while the previous was for 6 years. The funding gap, however, remains high; i.e., US\$ 120 million. With such a funding gap, it is not possible to assess whether the funds requested seem appropriate.

Flagship 5: Pre-breeding and trait discovery [Score: Moderate]

FP5 focuses on widening the genetic base of GLDC crops and provide an extensive tool kit of modern genomics, genetic enhancement, breeding tools and high precision phenotyping for efficient breeding.

According to this FP's narrative, the major reasons for the slow progress in realizing genetic gain in GLDC crops includes the slow adoption of modern technologies, narrow genetic base of current cultivars, and lack of appropriate cultivars with market-preferred traits. FP5 plans to address these constraints through a better understanding of market preferred traits, applying modern technologies to discover these traits in available genetic resources, and widening the genetic base of pipeline cultivars. The narrative provided for this FP does not allow for a thorough assessment of the plausibility of its ToC. The impact pathways arguments for breeding are fairly straightforward, at least up to delivery of traits.

The FP narrative states that "*Hence, FP5 focuses on exploiting the untapped genetic resources of wild relatives and landraces.*" The role of markets, demand and value chains is largely absent. The pre-selection even of cultivar traits has to take into account the business model and consumers' preferences. The use of wild species and landrace gene pools are not new for breeding grain legumes and dryland cereals.

The quality of the science is sound but also ambitious. Due to the inclusion of nine crops in GLDC a large number of traits are included in the breeding program. It will take careful organization and judicious use of resources to address all of them. Table 5.1 is useful in understanding that there is a realization that realistic targets are needed – not all crops will be able to benefit from cutting edge technologies by 2022. The leadership team of FP5 is impressive; the leader has substantial experience in genomics and trait discovery over a decade in multinational private sector. Several of the team have experience in marker-aided breeding including two scientists from CIRAD.

FP5 clearly builds on past research in Phase 1 and recent enabling breakthroughs such as the sequencing of a reference genome in several GLDC crops, the recent capability to undertake large-scale sequencing of germplasm collections, the regeneration of synthetic interspecific hybrids of the cultivated groundnut, discovery of desirable traits in wild lentil species, and wider use of hybrid technologies across crops and agro-ecologies.

Alignment with regional and national priorities is not specifically addressed in FP5 even in the partnership section. On the other hand, unlike most other FP narratives, an effort has been made to address the unintended consequences of discovering and breeding for particular traits. Of note, FP5 is aware of the potential trade-offs between markets and household nutrition. Smallholders may market the nutritionally enhanced varieties for increased income and eat poorer quality food as a result. This potential problem will be monitored by FP1, FP2 and FP3.

Two types of partner are recognized – those that deliver knowledge and expertise for deployment of genetic resources in breeding e.g. ARIs and those that assist in the development and delivery of outputs e.g. NARES. A large number of partners are listed, which will add value in terms of scientific contribution and ability to enhance the probability of impact. The Hybrid Parent Research Consortia are highlighted as successful public-private partnerships for sorghum, pearl millet and pigeon pea in India, while DuPont/Pioneer Hi-Bred is emphasized as a private company partner.

Appropriate consideration has been given to the areas of trait development of relevance to women and youth. Gender issues have been considered in shaping the research framework. It is more difficult to identify traits of interest to youth – reduced drudgery traits will help youth labour while preferred market traits could help facilitate youth engagement in the value chain. There is no direct recognition of the enabling environment. However, CoA3 considers enabling technologies which are essential for successful trait discovery.

Capacity development will focus on NARES partners through scientific workshops, short training courses, studentships, scholarships, seminars, and exchange visits. Infrastructure capacity will be developed for nutritional quality analysis. Funding seems to be already available through a BMGF project.

The revised budget for FP5 is US\$ 44.5 million compared to US\$ 80.4 million in the 2016 proposal. Considering the reduced timeframe (by one year) the budget is lower at 10.6% of the total compared to

15.4% in the 2016 proposal. However, the funding gap is large at US\$ 27.6 million. With such a funding gap, it is not possible to assess whether the funds requested seem appropriate.

6. Characterization of Flagships

FP	Main strengths	Weaknesses/Risks	Rating
<p>FP1: Priority setting and impact acceleration <i>Ensure that GLDC research is demand-driven, outcome-focused, inclusive and scalable with high potential for large impact contributing to the SRF and SLOs.</i></p>	<p>The ToC of FP1 is well-articulated and plausible providing the key assumptions listed are addressed.</p> <p>Priority setting is long-term and built upon in-depth scientific ex-ante impact and foresight analysis, which has already begun.</p> <p>Explicit incorporation of lessons learned</p>	<p>Inadequate consideration of demand side issues in prioritization.</p> <p>Lack of clear articulation of how the FP activities can achieve transformation in targeted agro-ecosystems</p> <p>Potential overlap between FP1 and FP2</p>	<p>Moderate</p>
<p>FP2: Transforming agri-food systems <i>FP2 will strengthen agri-food system mechanisms to respond and adapt to context-specific and evolving needs of women, men and young farmers, value chain and governance actors.</i></p>	<p>Issues addressed in FP are key to success of this CRP</p> <p>Commitment of key implementation partners to the FP</p> <p>Strong leadership.</p>	<p>Lack of clearly articulated ToC and impact pathways specific to GLDC</p> <p>Lack of integration to other FPs despite key role in shaping the science agenda and delivering key results</p> <p>Concerns about dependence on partnerships for delivery</p> <p>Potential overlap between FP1 and FP2</p>	<p>Weak</p>
<p>FP3: Integrated farm and household management</p>	<p>The ToC is well articulated but also very ambitious.</p>	<p>Concerns about the capabilities of the proposed team to address the livestock component of the target crop-livestock systems.</p>	<p>Moderate</p>

FP	Main strengths	Weaknesses/Risks	Rating
<p><i>FP3 will improve the profitability, productivity and sustainability of smallholder farming systems using on-farm and in-household innovation to ensure household nutritional security and enhanced income generation through integrated crop, tree and livestock production systems</i></p>	<p>Feasible impact pathway providing the assumptions can be validated.</p> <p>Evidence that FP3 has learnt from previous research and is building on findings and successes from Phase 1.</p>	<p>Lack of detail on how risks will be managed, despite its importance in the FP narrative</p> <p>Generic gender strategy not adapted to specificities of the FP and weak youth strategy</p>	
<p>FP4: Variety and hybrid development</p> <p><i>FP4 aims to ensure that high-yielding, nutrient-dense and market-preferred GLDC varieties and hybrids are locally available and utilized by women, men and young farmers and value chain actors.</i></p>	<p>The ToC and the described activities seem plausible and are supported by realistic assumptions</p> <p>Strong focus on seed systems and useful analysis of both success stories and failures in seed systems for GLDC crops incorporated into the proposal</p> <p>Gender issues specifically addressed through four prioritized activities</p>	<p>Target of reducing by 30% the grain yield gap is extremely ambitious.</p> <p>Lack of clarity on how knowledge-led breeding approaches for CRP's crops accelerate genetic gains and improve cultivar release pipelines.</p>	Strong
<p>FP5: Pre-breeding and trait discovery</p> <p><i>FP5 focuses on widening the genetic base of GLDC crops and provide an extensive tool kit of modern genomics, genetic enhancement, breeding tools and high precision phenotyping for efficient breeding</i></p>	<p>Clearly builds on past research in Phase 1 and recent enabling breakthroughs in the science of GLDC crops.</p> <p>Effort has been made to address the unintended consequences of discovering and breeding for particular traits</p> <p>Strong leadership</p>	<p>Narrative does not allow for assessment of validity of Theory of change.</p> <p>The role of markets, demand and value chains in determining trait selection is largely absent.</p>	Moderate

ANNEX. Synthesis of donor-perspective reviews

Background:

The CGIAR Strategic Impact, Monitoring and Evaluation Committee (SIMEC) requested the ISPC to coordinate a review process of the GLDC CRP-II following the criteria developed by the Fund Effectiveness Working Group (FEWG) of the System Council. This review is separate from the ISPC review process, and the ISPC role in this effort is solely to coordinate and consolidate. The reviewers were proposed by SIMEC, and the format and criteria used for the review the same as that of the 2016 review.

A summary of the findings of the reviews is given below for the CRP as a whole and for the Flagships. The scoring of the CRP-level criteria is summarised in Table 1.

Key points from donor-perspective reviews

- The tone of reviewers' comments on the new GLDC proposal is generally positive.
- The reviewers note that the cross-cutting transversal research topics, like foresight, priority setting, adoption, gender and enabling environment that are addressed in one Flagship (FP1) and fed in all other FPs a good way to increase coherence across flagships.
- The reviewers indicate they think each of the FPs had some articulation of how they would work together but some were not convinced that this would be a closely integrated approach at CRP level.
- Reviewers stressed the critical importance for CRP management to drive integration. It is not clear, for instance, to what extent the program management at CRP and FP level, coming from IITA, CSIRO, ICRAF, and ICRISAT will have the capacity to deal with the multi-sector-challenges faced by GLDC.
- The high complexity of the program could be a risk for goal achievement, if not guided by a strong and clear management structure to use the synergies to full capacity and to keep transactional costs due to complex interfaces at a feasible level.
- There is an overall funding gap of 63%, which is a considerable risk for goal achievement, even for the first level priorities.

CRP level summary

Review of CRP relative to donor-perspective review criteria at CRP level.

CRP Q1: Coherence across the flagships to deliver an integrated research program.

At the CRP level, is there sufficient coherence across the flagships and linkage between the flagships to deliver an integrated research program? (Score 0 to 5)

Scores (out of 5; by reviewer-R1-4): 3 4 5 3

There was variability in reviewers' assessments of the overall coherence of the GLDC CRP, as reflected in the scores given. The fact that transversal research topics, like foresight, priority setting, adoption, gender and enabling environment are addressed in one Flagship (FP1) to be fed in all other FPs is found to be a good concept to increase coherence across FPs. The linkages between the FPs are fairly well described within each FP, yet the current the impact pathway of the overall program does not display those interrelationships and particularly their chronological sequence is not clear in the graphic. Each of the 5 FPs had some articulation of how they would work together but most reviewers were not convinced that this would be a closely integrated approach. Reviewers stressed the importance for the CRP management to drive integration across FPs.

CRP Q2: Likelihood of success in research objectives

Likelihood that proposed research objectives will be achieved within 6 years (Score 0 to 5)

Scores (out of 5; by reviewer-R1-4): 2 3 4.5 3

The reviewers' scores of this question were relatively lower than for other questions. It was noted that the research objectives of the proposal target not only "traditional" technical issues such as new varieties, new breeding technologies but also more systemic issues (innovation systems, inclusiveness, policy, markets). It is not clear, to what extent the program management at CRP and FP level, coming from IITA (FP1), CSIRO (FP2), ICRAF (FP3), ICRISAT (FP4 and FP5) will have the capacity to deal with these multi-sector-challenges. This had already been mentioned by ISPC comments from Sep. 2016. To overcome this potential bottleneck, emphasis has to be put on the right composition of the RMC, to make sure that system issues are well reflected in program set up and approach. There is some uncertainty about objectives of FP2 and FP3, because their presentation is vague making it difficult to see clearly the research questions and the actionable results of the CRP. An important risk is linked to the high degree of ecological, social and political uncertainty in the drylands (to a greater degree than the high rainfall or irrigated environments). For example, a severe drought in WCA or India would reduce yields and perhaps harvested areas, discourage traders and slow private sector investment in GLDC value chains. Therefore, it is probable that some targets in some countries might not be fully achieved by 2022, although there are grounds for confidence in the overall result. Most of the CRP objectives will be embedded already in W3 grants, and may have the geographic specificity that are often a feature of these kinds of grants. It would be good to surface what the CRP is doing that is above and beyond what is already embedded in W3 projects.

CRP Q3: Good fit within SRF goals and priorities

Is there a good fit within SRF goals and priorities? (Score 0 to 5)

Scores (out of 5; by reviewer-R1-4): 4 4 5 4

Reviewers were generally more positive about the CRP's alignment with SRF goals and priorities. Additional studies and reports have been commissioned (foresight report, ex-ante evaluation of research etc.) to feed into the new proposal, which has helped considerably in strengthening the alignment.

CRP Q4: Risk identification and management

Have risks been identified and risk management plan strategies proposed? (Score 0 to 5)

Scores (out of 5; by reviewer-R1-4): 4 3 4 -

Climatic risk is emphasised and appropriately analysed and managed. Perhaps less well described is the risk of civil strife and social instability which is increasing in prevalence in drylands with growing population density, reduced mobility and increased climatic variability (R3). The high complexity of the program could be a risk for goal achievement, if not guided by a strong and clear management structure to use the synergies to full capacity and to keep transactional costs due to complex interfaces at a feasible level. There is an overall funding gap of 63%, which is a considerable risk for goal achievement, even for 1 degree priorities. As all FP are more or less interdependent, particularly FP 1 and FP 2 with the other 3 FPs, a slimming down of the program due to funding gaps must take these interdependencies into consideration in order to maintain the synergetic and systemic approach.

Flagship Reviews

GLDC CRP has 5 Flagships:

FP 1: Priority Setting and Impact Acceleration.

FP 2: Functional Agri-food Systems.

FP 3: Integrated Farm and Household Management

FP 4: Variety and Hybrid Development

FP 5: Pre-breeding and Trait Discovery

FP1: Priority Setting and Impact Acceleration

FP1.Q1 Potential for Impact

Reviewers had generally positive comments on the potential impact of this FP, with some suggestions of possible improvements. FP1 combines priority setting with ex-post assessment and continuous monitoring from other flagship outcomes and therefore plays an important role in bundling and framing overall research activities and paving the road for a coherent program approach. The establishment of CoA 1.4 regarding scaling to accelerate impact is very useful and promising, but this is still generic and needs much more operational details to become effective (R2). The underlying design of the FP was not clear; it is also not clear why there is climate change work that is crop agnostic in this Flagship and the CRP as a whole, as opposed to the work done under CCAFS (R1). Direct target groups of the FP proposal are students, post docs and national and regional institutions engaged in agricultural research. It is yet not clearly outlined in the proposal, how the support of the direct target group/institutions can finally result in a better level for the beneficiaries.

FP1.Q2 Strategic alignment, logistical viability and governance

In general, Reviewers think that there is good alignment between the proposed interventions or research products and established diagnoses of challenges/problems. They note that FP1 is a logical foundation for strategic engagement and focusing of the GLDC (R1). It responds to the poverty, food and nutrition insecurity and NRM issues, as well as the grand challenges, outlined in the context of the drylands. They find that partners embrace a diverse range of global, regional, national and local public, CSO and private actors – including the University of Minnesota which has considerable experience in targeting. Management does appear to be streamlined and therefore can be expected to be cost-effective.

One Reviewer noted that an important partner not yet mentioned in this FP are the CAADP Technical Networks that have been established in 2016. One of these networks focuses on Agricultural Research and Extension. Cooperation with numerous scaling-out partners, mostly from the private sector, which are already running large programs in GLCD target ecologies, are supposed to create win-win situations regarding knowledge and outreach. In this context, the role of the Pan African and regional Farmer Organizations should be considered as well.

FP1. Q3 Comparative advantage and cost effectiveness/value for money

There are generally alternative sources of supply for priority setting and impact pathway work, but the proposed IITA led partnership is suitable (R3). This reviewer thinks that alternate providers would be less cost-effective and associated with higher risk, lacking the trusted partnerships with a wide range of NARS that the CGIAR Centers such as IITA have or the ability to tap into other experienced scientists in-house. Another reviewer (R1) suggests that IFPRI and CCAFS could possibly do the foresight and climate analysis without GLDC. Value chain gender, adoption work can be done by any number of NGOs and private sector, while governments can be involved in the enabling environments and scaling work.

One reviewer (R4) was unable to comment on value for money, as he found the research activities not specific enough to ascertain their cost. R3 on the other hand concluded that the modest budget allocation will have an excellent value for money and reduce the risk of poorly targeted research by FPs 2-5 – in fact, a good case could be made for augmenting the FP1 budget. R2 also thought that FP1 plays an important role in setting priorities and maintaining the coherence of the overall program, it is also central for cost effectiveness. Given the strategic importance of FP 1 and the broad topics to tackle (particularly CoA 1.4), the FP is endowed with only 8 % of the budget, eluding to the possibility of increasing the budget for this FP.

FP1. Q4 M&E and Learning (MEL)

Reviewers found it difficult to comment on MEL as they could only find reference in the document saying the ME&L work would be based on a tool and approach of the previous Drylands System CRP. R4 found it very difficult to get from the proposal what indicators could be monitored. But suggested that this could be done at the time of planning detailed work. In any case, monitoring would

require establishing indicators of quality as well as the number of studies done. R3 found MEL description to be well formulated except for a lack of elaboration on learning. Milestones are well described but too many in number. Some of the means of verification and outcomes could be more specific. The foresight work should be completed before 2020. R1 thought that the foresight, gender and enabling components will have measurable outputs but these may not have significant outcomes within the timeframe of this CRP. It is likely the value chain component will have measurable outcomes if local production and sales can be tracked.

FP2: Functional Agrifood Systems

FP2.Q1 Potential for Impact

Reviewers agree on the high potential impact of this flagship and its centrality to the CRP. However they note that FP2 has a built-in assumption that the tools and processes developed will be used by multiple stakeholders to good effect and help unstick value chain opportunities (R1). The reviewer also thinks that the critical issue for success of GLDC crops is to improve their productivity and reduce prices to improve supply and price and thus encourage commercial market opportunities-the tools will be an add-on for some increases in efficiency. He rated the overall design of the FP as medium. He also rated as medium the level of institutional buy-in. Because of the large number of potential FP2 research contexts, the priority setting of FP1 will be crucial for FP2 (R3). In this context, an emphasis on the four most important crops should be considered. This reviewer noted that the writers of this CRP exaggerate the level of difficulty for women's engagement in value chains in 'typical free market situations', especially with the rapidly increasing feminization of agriculture – in some cases they are clearly the dominant actors – but it FP2 does indicate a search for novel arrangements to expand the engagement of women.

Another reviewer asks a question about the “*niche market*” and “*premium price*” products: is this locking farmers into a low input – low production mode? Would this generate enough value for farmers at scale (how large is the niche)? He also highlighted the possibility of a missed opportunity for the recognition of the increased opportunity for pulses in expanding Conservation Agriculture-based systems. Demand for improved pulses, and product definition for these improved varieties, will be influenced by Conservation Agriculture. This is the sort of opportunity which would justify the integration of research which this CRP will foster.

Since FP2 is central for engaging stakeholders in market opportunities, youth should explicitly be mentioned in the impact pathway on FP outcome level (R2). It is not clear what “poor women and men” and “other marginalized groups” at outcome level exactly means. To better conceive tools and products for beneficiaries the term “poor” should be defined thoroughly to make sure that program output is appropriate for specific target groups who then use this output to achieve the intended outcome.

FP2.Q2 Strategic alignment, logistical viability and governance

There is agreement among reviewers on the alignment of the FP2 with overall goals. They indicate that justification for the FP is well articulated but robust use of the tools will be needed for making real impact possible. They note that the flagship is led by an experienced and acclaimed researcher, with in depth knowledge of innovation systems theory and broad experience with innovation systems. They find that the proposed partnerships and collaborators are good choices. The setup of a multi-stakeholder-platforms is a good step to strengthen critical links, it should be yet clarified, if already existing platforms/initiatives could be joined and supported. The Institutional and management arrangements appear to be satisfactory.

FP2.Q3 Comparative advantage and cost effectiveness/value for money

Reviewers question the need for the CGIAR involvement in this work. One reviewer even suggests that CSIRO could do most of this work on their own. The engagement of the private sector will be

essential but the document does not convince that the strategy for this is in place. Comparative advantages and cooperation is sought with partners like Farmers Organizations, MS Intelligent Cloud Platform and NRO to implement on the ground innovation. Additionally, private sector companies should play an important role in agri-food-systems, which is not yet sufficiently reflected in the ToC and partnership model of FP2. One reviewer found it Impossible to comment, citing the statement from the proposal (page 42) that “These solutions can include ...” a long list of all possible areas of work. Leading to questions such as: *which areas will FP2 actually work on? How much of it is already being done, what is new?*

There are few alternate providers, e.g., KIT, but none with the capacity of CSIRO to lead such research across regions, cereals and legumes. The research can draw on the assets and experience of the agribusiness hub in ICRISAT. Given the number of crops and farming system contexts, the US\$ 62 million budget is adequate.

FP2. Q4 M&E and Learning (MEL)

Reviewers could only find reference in the document saying the MEL work would be based on a tool and approach of the previous Dryland systems CRP. The MEL strategy is somewhat less well developed than for FP1. Learning appears as a specific milestone for shared learning, rather than a supra-M&E function. Indicators are very difficult to establish at this stage. Possibly during planning of detailed work. Qualitative assessment would be required to evaluate how well the activities have been performed and what is the quality of the outputs.

FP3: Integrated Farm and Household Management

FP3.Q1 Potential for Impact

Reviewers have mixed views on this FP; they found this FP to have a clear route to impact through scaling partners. Potential for impact from FP3 is coming from its systems approach at farm- and household level. But the consistency of the proposal is partly weak, impact pathway and ToC being partly described in the “Rationale and Scope” of FP 3, therefore chapter FP3.3 (impact pathway and ToC) is quite short and non-exhaustive. There is large potential for impact, and more importantly a key step on the impact pathway, but reviewers note that the proposal document does not show what will be done. The gender aspects are well presented, although this reviewer would prefer impact oriented research designs which disproportionately benefit women rather than the articulation of ‘do no harm’. Impact could be expected from this FP within 5-10 years. The institutional setting (social values, rules, norms, traditions etc.) which are listed within the overall CRP impact pathway (p.13) are not sufficiently reflected in the key assumptions of FP3. Scaling out is through partnerships with NARES and NGO’s, there is nevertheless the high risk, that those partners do not have sufficient funds to realize the intended roll out process (see chapter CRP Q4/risk management).

FP3.Q2 Strategic alignment, logistical viability and governance

Reviewers agreed in general on the strong alignment between the proposed interventions or research products and established diagnoses of challenges, as this FP addresses critical cropping systems issues of the drylands. One reviewer found that objectives and the CoAs are confusing, overlapping, and remain vague. Another reviewer also found confusion between Outputs and outcomes in this FP. Having the ICRISAT DDGR in charge will help overcome some of the leadership and institutional power issues that arose with the previous CRPs. This flagship is led by an experienced researcher. The linkages to other FPs are well summarised in Table FP3.1 Private sector will be involved, although to a less degree than in FP2. The statement about Genebanks suggests a lack of consultation with FP4-FP5. Will ICRAF be able to make sure this work does not proceed in isolation of the other FPs.

FP3.Q3 Comparative advantage and cost effectiveness/value for money

Potential alternatives providers for the proposed research include universities like Wageningen, with NGOs could also do what is proposed herein. However, the place-based nature and crop specialization

my make the CG a stronger partner if the scientific expertise is equivalent. However, unique assets of the CGIAR institutes is their place-based nature relative to their customers, international nature (ease of movement across borders, international recruitment of scientific talent, focus on crops of the developing world, etc.). These assets are important for field agronomy research such as what is proposed for FP3. Engagement of local research and extension services will be essential to access farmers. The total budget is barely adequate (\$ 89.000) and the reduction after year 2 could be discussed.

FP3. Q4 M&E and Learning (MEL)

Reviewers point out that some of the outcomes depend on new laws and policies, which may not be possible to realise within the 5 year frame of the FP/overall CRP, thus questioning the achievement of outcome and its contributions to SLO. Some spatial analysis outputs which should be part of FP 1 were listed as milestones for FP3. Many means of verification are reports, which is a bit simplistic. Indicators remain to be developed. At this stage, no indication of specific activity and scale to be monitored.

FP4: Variety and Hybrid Development

FP4.Q1 Potential for Impact

FP4 builds on long-term experience of plant breeding technologies from the CGIAR and a strong partnership network. The underlying product concept notes are a good starting point to further improve varieties with ongoing feedback from the other FP. The ToC is yet not very consistent and includes splattered information (summary of FP 4 partners) which should figure in other chapters. A real case is missing how the FP with its CoA engender change and how breeding of new varieties- with the necessary enabling environment (including other agronomic measures) feed into the overall program. Key assumptions within the ToC include topics, which should be under the responsibility of the FP, like capacity development and not treated as an assumption. The inclusion of CoA 4.4 (scaling of seed technologies) is of strategic importance for sustainable impacts in crop improvement. However, reviewers note that improved varieties and hybrids for 9 crops targeted to the distinct environments is quite a challenge, and once again priority setting from FP1 will be very important for this task. The pathways through seed systems and other FPs, notably FP3 and FP2, are obvious. Farmers, value chain actors and consumers can benefit through markets and distinct preferences. This is a medium term impact FP, >10 years. Partners have confirmed their buy in, and partners would recognise the strength of this FP in ICRISAT and other CGIAR Centers such as IITA. Gender is explicitly recognised and participatory breeding will be one vehicle for articulating women farmers' needs. Genetic improvement can solve problems and can provide options for farming systems to evolve. But obstacles to impact are large, around seed systems, seed dissemination and seed availability. The obstacles are discussed by the FP to some extent, but may be better addressed under FP2 and FP3: this is an opportunity for linkages. One reviewer question the use of the term "yield gaps" to describe increased productivity, and "genetic gain" used as a % yield increase only.

FP4.Q2 Strategic alignment, logistical viability and governance

Reviews agree that has strong alignment as it addresses critical issues like climate change through the rapid and continuous development and deployment of new varieties bred in the current climates of the drylands. Seed systems are naturally emphasised. For this purpose, large national or regional seed companies should be distinguished from local entrepreneurs who are often the last mile in selling improved seed. There should be a clearer explanation around embedded knowledge in improved seeds. The budget is relatively high. Institutional arrangements are well designed. This flagship is led by an experienced research leader.

FP4. Q3 Comparative advantage and cost effectiveness/value for money

There are institutions that could provide breeding support to NARS programs on a crop x crop basis or at an institutional level. However, it would be difficult for these institutions to work across borders, for example on regional disease or pest issues where this would be a more efficient approach than having separate country-focused efforts. The unique assets of the CGIAR institutes is their place-based nature relative to their customers, which are important for plant breeding that is the focus of FP4. ICRISAT is home to the substantial germplasm in a majority of the crops, and a mini-core subset exists for chickpeas. The CGIAR has a clear advantage over alternate public sector varietal improvement or private sector. Some of the crops have narrow niches which would not be attractive to profit making seed companies. As noted above, impact targets should be medium term, > 10 years. The budget is larger than necessary. One reviewer noted that the fact that the identification of farmer and market preferred traits is located within CoA 4.3 refers to FP1 outcome regarding priority setting. At this stage, testing of preferences on farmer's level seems quite late. Therefore it should be further explained, how this fits in overall concept.

FP4. Q4 M&E and Learning (MEL)

Reviewers note that the targets for genetic gain could be defined better and then monitored. But it would require much more details for each crop and each trait. The current document has remained too general for this definition. Clear opportunity for the Excellence in breeding platform to assist in defining genetic gain and other metric of success.

FP5: Pre-breeding and Trait Discovery

FP5.Q1 Potential for Impact

Reviewers agree that this FP has a clear route to impact through FP4. Cooperation between FP4 and FP5 is clearly designed and laid out in the FP5 impact pathway. It still needs further clarification, how the sequential process is, to feed results timely into the overall program impact pathway to reach the targets 2022 (R2). The trait discovery, functional breeding and pre-breeding have relatively simple pathway. But the targeted increase in yield will be challenging in the drylands (R3). ICRISAT has excellent facilities, including the germplasm. Partners have apparently committed, but impact will of course take more than 10 years. One reviewer (R1) stressed that the challenge will be to ensure there is intimate association between the work of FP5 and FP4 and management mechanisms that promote integration of new products coming from FP5 into FP4. He also found the underlying design of the Flagship to be clear, and rated it as high.

FP5.Q2 Strategic alignment, logistical viability and governance

Reviewers agreed that this FP's proposed interventions address the need for cultivars with resistance to the most important production constraints and opportunities that are tackled by breeding and critical issues like climate change through the rapid and continuous development and deployment of new varieties bred in the current climates of the drylands (R1). They also think that FP5 supports the long term performance of FP4, as a critical component of using modern plant breeding (R4). However, one reviewer (R3) found that alignment with the background context and analysis is weaker than for the earlier FPs. There are natural links to the platform on excellence in breeding and other CRPs. Suitable partners including the private sector are identified. Governance and management is sound through the CRP organs.

FP5. Q3 Comparative advantage and cost effectiveness/value for money

There is general agreement among reviewers on the strong comparative advantage of CGIAR and ICRISAT. ICRISAT is well known for trait discovery and functional breeding, and the CRP is designed as a good use of ICRISAT strengths (R3). Germplasm resources, access to field/phenotyping locations and access to breeding programs (under FP4) across the region give the CGIAR platform, and thus this FP, a unique and cost-effective way to discover and deliver new traits and technologies to small holders (R1). Other institutions could possibly do a part of this continuum and likely for only a single crop, and would have less flexibility to work and make impacts regionally.

However, linkages with Advanced Research Institutes can be very powerful way to bring in new technologies and these should be sought out.

The scale of the budget is found appropriate, and the funding to be directed appropriately.

FP5. Q4 M&E and Learning (MEL)

Reviewers could only find reference in the document saying the ML&E work would be based on a tools and approaches of the previous Drylands System CRP (R1). This reviewer also thinks that this FP will likely not generate measurable outcomes for wholly new technologies, but things that are at end-of-stream in the discovery phase might produce measurable outcomes, that are not specified in the proposal. Another reviewer (R4) suggests that indicators could be developed but are not explicit at this stage. They would have to be crop specific.

Table 1. GLDC: Summary of Reviewers' Rankings, at CRP level for Qs 1-4, by reviewer

CRP Criteria	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Average score (%)
CRP Q1 Flagship integration	3	4	5	3	75%
CRP Q2 Research objectives	2	3	4.5	3	62.5%
CRP Q3 Fit to SRF goals and priorities	4	4	5	4	85%
CRP Q4 Risk management	4	3	4	-	73%