

Proponent's Responses to FC Members' Comments on CRP 3.5 Grain Legumes 05 November 2011

On behalf of all the partners involved in the Grain Legumes CRP 3.5, we would like to express our sincere thanks to the Fund Council (FC) Members for their comments and suggestions on the CRP 3.5 document that was submitted to the CGIAR Consortium, and recommended to the Fund Council for approval.

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Australia 1.1	<p>It seems the benefits from biological nitrogen fixation (BNF) of grain legumes (GL) may have been both double counted and overestimated in the <i>ex ante</i> impact assessments (p.22 and Appendices 5 and 6). Appendix 6 indicates that yield losses from inefficient BNF have apparently already been included in the calculation of economic benefits from successful BNF research in the top of Table 5.2 in Appendix 5. Hence it is not appropriate to count also the fertilizer N equivalents from the improved BNF as a further benefit from research. Additionally, from the description provided in Appendix 5, p. 186, the N savings from BNF seem to have been estimated as the <i>total</i> N fixation embedded in above and below ground biomass of currently sown areas, rather than the <i>additional biomass/N fixation</i> attributable to the BNF research. That portion of the additional N that remains in situ as a residual that can benefit subsequent crops is a legitimate additional benefit to include, although the difficulties in estimating these are well articulated in a recent paper commissioned by SPIA of the ISPC [Tripp (2011, pp.14-19)] that is cited in the proposal. The residual N effects can be quite variable and depend on the GLs harvest index, stubble management practices, crop duration etc. Indeed such issues are suitable candidates for research in CRP 3.5.</p>	<p>We have reviewed the calculations and believe that the methodology was logical and reasonable following the approach of Herridge (2008), while agreeing that there is much uncertainty in any BNF estimate due to large variability in environmental conditions and management practices. On the question of double-counting of N benefits, to our understanding, the benefits flow from two economically-independent value streams. The first stream is the farm-gate value of additional grain projected to result from a 20% yield increase over 20% of the target grain legume areas by the year 2020 – ramping up to that level over the 2014-2020 period according to the projected adoption profile depicted in Appendix 5, Fig. 5.1 on p. 186. Annual increments of production gain following that curve were aggregated to calculate the total additional grain produced over the 2014-2020 period, and then multiplied by the value of that grain estimated from the price projection methodology described on p. 184. This cumulative additional grain value stream is a result of a number of technical contributions including BNF, stress and disease resistance etc. listed in Appendix 6. The second stream is the value of the nitrogen fertilizer that did not need to be applied in order to generate that 20% yield gain. The farmer benefits from both value streams, they are not duplicative. Stated another way: In the absence of additional BNF, to obtain the additional 20% yield gain a farmer would be required to apply sufficient nitrogen fertilizer to compensate for the missing BNF. This fertilizer application bears a</p>

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		<p>cost, which is distinct from the positive value of the additional grain produced. Estimating that cost through BNF is a value that is thus additional to the value of the additional grain. Our calculation estimates these two value streams and sums them, as it seems appropriate to us. We would, however, be very pleased to discuss this further with Australian experts if we are missing some logical steps or have misunderstood the critique put forward by Australia. On Australia's second question, we have reviewed our methodology and confirm that the amount of BNF that we calculated was that associated with the additional grain produced, not with the total grain produced. We agree that we should have been clearer on p. 186 in expressing this within our equation for calculating BNF, viz., by adding the term "x additional fraction of grain produced" to the formula expressed in the sentence that begins "The calculation is...".</p>
1.2	<p>It is pleasing to note that a serious effort has been made to assemble information on the major biotic and abiotic constraints facing the GLs in the various regions and assess their likely contribution to plausible yield gains from research, and hence their relative priority (Appendices 5 and 6 and tables 5.2.1 and 5.3.1). These have been used in the overall <i>ex ante</i> impact assessment to arrive at a conservative estimate of a benefit/cost ratio of 6:1, which is impressive. However there is no discussion of how these estimates of individual benefits from successful research on each constraint will be used to set priorities in the event of budget shortfalls.</p>	<p>We are glad to note the appreciation for collating the data on yield losses caused due to various biotic and abiotic constraints in Grain Legumes. The information provided in Appendix 6 (Relative importance and yield losses (%) due to biotic/abiotic constraints in grain legumes in different regions) and Table 5.3.1 (Yield gap and plausible closure of yield gap (PCYG) for grain legumes across priority target regions) have been used to prioritize the major traits to be targeted for breeding for resistance/ tolerance to various diseases/ pests and abiotic stresses. However, we will further use the data for future priority setting exercises.</p>
1.3	<p>Risk is the overwhelming driver where legume production is decreasing with respect to cereals. Distinct strategic dimensions for lowering risks were raised and are associated with:</p> <ol style="list-style-type: none"> 1. Policy 	<p>With respect to Policy, this has been detailed in section 5.4.6 of the proposal that offers various solutions for promoting legumes under cereal scenarios. This includes policy advocacy (partnering with CRP 2), business models and capacity building.</p>

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	<p>2. Biotic and abiotic stresses</p> <ul style="list-style-type: none"> a. Transgenic solutions b. Solutions involving “conventional” breeding and genetics. <p>Within this framework, the proposal dealt confidently with 2b. The arguments for opting between strategies 2a and 2b were clear but somewhat hidden in the document, which should be more assertive and compelling on the issue of deploying transgenic solutions as rapidly as possible where natural variation is unavailable. A bolder and more confident document is required to highlight this application of new technology in the Foreword. With respect to policy, dimension 1 above, the influence of pro-cereal, anti-legume market distortions are flagged without real solutions, or even next steps, proffered.</p>	<p>We agree that the use of modern biotechnological solutions such as the transgenic technology for difficult to breed traits would be a key to achieve successful crop improvement. CRP 3.5 Grain Legumes will embrace the transgenic technology wherever necessary and has been indicated in the document, specifically under the Strategic Objective 1 and Output Target 5.1.7.4. As indicated on p. 48, the Deployment Strategies for the developed transgenic technologies in CRP 3.5 will be undertaken through proper translational activities (e.g., ICRISAT’s PTTC) that will enable product development and its commercialization by involving appropriate stakeholders, and following national bio-safety guidelines.</p>
1.4	<p>It seems that there is to be no major shifts in priorities among the six strategic objectives (SO) based upon a comparison by us of the budget shares revealed by further analysis of table 14.2. Only minor shifts in budget shares are evident between 2011 and 2013. Small increases occur for SO 4 and 6 and small reductions for SO 1, 2, 3 and 5. It is disappointing that no justification is provided for these shares or evidence that they have been arrived at after a thorough strategic review of the past and future prospects of comparative success and zero-based budgeting. One can only conclude that historical allocations based on individual institutions have been the de facto default option in the budget exercise. If so it would be disappointing and represent a lost opportunity to take a system rather than an institutional perspective.</p>	<p>Considering that Grain Legumes have had limited R4D efforts in the past in many developing countries, CRP 3.5 has allocated greater resources initially to SO2 (Cultivar development), followed by SO4 (Seed systems) and SO1 (Genetic and genomic resources). The shift across the SOs is not as significant as desired in the first 3 years of CRP, as it takes time to strengthen capacities of the partners and re-align current funding. More significant resource re-alignments will be possible following the initial years of the CRP.</p>

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1.5	<p>It also seems that commodity/ regional priorities and budget allocations have not been based upon any systematic assessment of expected payoffs and development outcomes/impacts. At a minimum a simple congruence analysis between values of production, numbers of poor and malnourished and proposed budget allocations might have revealed apparent imbalances that deserved further review and re-justifications. As an initial attempt, we compared the commodity shares of total gross value of production calculated from Table 3.1 with proposed commodity budget shares calculated from Table 14.3. This revealed that beans will represent 26% of the total budget, while it is only 11.6% of the total GVP of the eight GLs. Similar lack of congruencies occur with lentil (6% of budget and 2.9% of GVP), and cowpea (13% of budget and 9.1% of GVP). On the other hand with groundnut the apparent imbalance is in the other direction, with it receiving only 16% of the budget yet representing the highest share of GVP of 33.9%. Again these budget shares appear to signify reliance on historical allocations rather than an assessment of likely benefits and probabilities of success from alternative allocations. However it would be useful to know how they were arrived at. Perhaps the proposed allocations are appropriate in view of the spillovers among the species and the plans to share facilities and methodologies among the partners involved, but the rationale needs to be provided.</p>	<p>We agree with the comments that the proposed allocations are appropriate in view of the spillovers among the species and the plans to share facilities and methodologies among the partners involved. CRP 3.5 partners initially allocated the budgets based on the importance of the crop in the farming systems in the regions. As the CRP progresses we will further sharpen the resource allocation to crops and regions.</p>
1.6	<p>The logic for a consortium approach among partners on a range of grain legumes as an integrated program is well made (pp.23-24 and Section 8), although the proof of the pudding will be in the eating. The benefits include a greater ability to influence policy on what are neglected crops, exploitation of scientific synergies and learning, shared expertise and facilities etc. Indeed one might ask why it has not proved possible to achieve the same</p>	<p>We consider CRP 3.5 as a unique opportunity of bringing Grain Legumes R4D partners together. Building on and considering the achievements of the on-going Tropical Legumes projects, we can confidently predict that this consortium approach would be effective in improving efficiency, research outputs and impacts.</p>

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	integration in a single CRP with the three major cereals, rice, wheat and maize.	
1.7	Less clear is the description of the relationship with other initiatives like Tropical Legumes I and II (TL I and TL II). CRP 3.5 strongly promotes the concept of breeding for the goal of promiscuous nodulation in legume species, citing what appear to be limited successes with soybean. As such, the strategy of breeding for promiscuity seems somewhat high risk and blue sky, and perhaps fits more logically within one of the TLs. The immediate concern is that CRP 3.5 prematurely reduces strategic focus on local production of the appropriate strains of rhizobium. Similarly the emphasis on other blue sky areas in the document, including breeding for increased carbon dioxide concentrations and biocontrol, do not play to strengths of the CGIAR partners and collaborators, and distract rather than support the CRP vision.	<p>CRP 3.5 will work very closely with TL-I, TL-II and N2Africa projects. In fact, ICRISAT, IITA and CIAT are already working together in TL-I and TL-II projects.</p> <p>Considering the immense benefits of BNF from Grain Legumes, we consider it worthwhile to develop varieties with improved BNF ability. In addition, we will also work on identification of more efficient rhizobium strains and the production systems. The partnership with N2Africa will be very useful for these efforts. The suggested areas of blue sky research will be further discussed and a few will be selected for pursuing further.</p>
1.8	Previous iterations of this initiative included the World Vegetable Centre (AVRDC) and mungbean. The current document is strongly underpinned by the report submitted to SPIA (Akibode and Maredia, 2011) that focused on seven of the eight crops now covered by CRP 3.5. Peanut and mungbean were excluded. The analysis of the world situation is diminished significantly by the absence of mungbean. Akibode and Maredia rightly highlight the successes of cowpea and soybean in West Africa and the fact that the overall world increase in pulse production has exceeded population growth for the period of the last 14 years. This international trend masks significant local ones. For example, in the Indian Subcontinent, considerably higher risks — both bio-physical and market-related — are significant limitations to increasing the proportion of legumes in crop rotations.	Mungbean and vegetable soybean were dropped from CRP 3.5 Grain Legumes based on the comments of the Consortium Board that mungbean and vegetable soybean would be most effective in a systems CRP, such as CRP 1.1 Dryland Systems, or in CRP 3.1 Wheat or CRP 3.3 GRiSP given the roles of mungbean and vegetable soybean in smallholders' rice/wheat rotations.

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	<p>Mungbean, especially through very early maturing varieties, is the one leguminous crop that is increasing rapidly in cropping systems based on both cereals and legumes. Consideration of earliness in the context of mung bean and system productivity would balance the slant CRP 3.5 gives on longer cycle and less determinant crop varieties.</p>	
1.9	<p>It is rather surprising to learn (p. 37) only 1% of the 133,395 conserved accessions of the germplasm of the eight GLs has been used in breeding programs globally. This is an indictment of past efforts of both the CGIAR and NARS and provides a compelling case for a high priority to be accorded to SO 1 and SO 2, which emphasize genetic resources conservation, characterization, and development of novel tools for improving the efficiency of crop improvement. These are true IPGs and the CG has a clear comparative advantage to deliver them. Recent advances in IT, high throughput genotyping and phenotyping, use of core, mini-core and reference collections, molecular genotyping, sequencing and marking, wide hybridization etc. provide excellent opportunities to make real progress with genetic improvement of GLs, which has had limited demonstrable impact in the past. Hopefully these new tools and methodologies will enable breakthroughs that have been elusive in the past 40 years of GL research in the CGIAR on hardy perennial constraints such as <i>Helicoverpa</i> in pigeonpea and chickpea, <i>Maruca</i> in cowpea and drought tolerance in groundnut, chickpea and beans. Indeed one could question the overall priority that should be accorded within the CGIAR to GLs in future compared to cereal staples, in view of the apparent modest impacts of past research in GLs compared to cereals. Such issues deserve further reflection by the CB and the FC. In this context, it is pleasing that SPIA of the ISPC is currently engaged in a study of the impacts of past research on</p>	<p>We fully recognize that SO1 and SO2 need to be given high priority in CRP 3.5. Accordingly, 47% of the total budget has been allocated to these SOs. The reduction in budget from 2011 to 2013 is modest (2%).</p>

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	GLs, which will provide a valuable input into future commodity strategies and priorities for the CGIAR. What is disappointing though is that while there is an emphasis on strengthening efforts in SO 1 and SO 2, this is not reflected in the proposed allocation to these two key strategic objectives. Their combined share of the total budget will in fact fall from 49% in 2011 to 46% in 2013.	
1.10	A further example of the benefits from the multi-species coordinated approach proposed in CRP 3.5 is the plan to conduct joint coordinated germplasm collection missions for wild species to broaden the genetic base in the quest for more weapons to combat biotic and abiotic constraints in GLs. This will have the advantage of avoiding multiple missions by different centers to individual countries.	We are glad that this effort has been appreciated by the Fund Council. This is a good example of utilizing the synergies among the participating centers.
1.11	The six SOs each have time bound, verifiable output milestones specified, which is evidence of a meaningful interaction among the partners in developing the proposal. However, outcome performance indicators (Table 13.1) while capable of verification in theory have not been specified in empirical terms. Presumably this will follow upon the development of business/operational plans.	This will be emphasized during the preparation of work plans for CRP3.5 Grain Legumes.
1.12	It is pleasing to see in the research questions on p. 54 the issue of possible trade-offs in breeding for nutritional qualities versus yield and other desirable traits. These are key issues for the CGIAR in the context of the food and nutritional security strategic objectives and are also being addressed in CRP 4.	These activities are strategically aligned with CRP 4 to avoid possible duplication of efforts.
1.13	The aim to breed chickpeas and groundnuts for resistance to herbicides in order to reduce the drudgery of manual weeding by	We recognize that with any technology, there are pros and cons that should be considered. Such analyses will be implemented as

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	<p>women (p. 63), highlights the potential dilemmas and trade-offs in pursuit of gender sensitivity. In the case of India in the 70s, Binswanger convincingly showed that herbicides would potentially displace large numbers of poor women, thus increasing their already high levels of unemployment and also lowering their wages. Is a reduction in drudgery at the expense of such an economic effect what they would prefer? Of course with herbicides less expensive now than then and wages higher (and unemployment lower?), it is not clear that herbicides should not be a preferred technology option, especially in Sub-Saharan Africa, where labor has always been a more binding constraint than in India. Such issues should be front and centre in the enhanced gender program proposed in CRP 3.5.</p>	<p>the CRP looks for appropriate innovations. We do believe that developing crops with resistance to herbicides will benefit the women by relieving them of physical drudgery. The time and effort could be used for gainful employment in more productive activities such as value-addition, and related entrepreneurship. This has the potential for them to contribute to agricultural development and socio-economic upliftment. However, further research is needed to better understand the impacts.</p>
1.14	<p>The proposal rightly highlights the need to focus on seed systems in SO 4. The agenda proposed seems to be appropriate for the CG, namely assessing constraints and how to alleviate them including private/public partnerships and roles, seed certification options for the informal sector, etc.</p>	<p>We appreciate these remarks.</p>
1.15	<p>As in other CRPs, this one proposes to have a significant emphasis on value chain analysis in SO 5. It is not clear to what extent such an emphasis will benefit the poor, especially poor consumers or what the comparative advantage of the CGIAR is in value-addition research or market oriented development. Value-adding means higher prices almost by definition, and this cannot be to the benefit of the urban poor, and maybe even not to poor rural net buyers of GLs. The proposal does not mention the implications of value-adding for poor consumers at all, the emphasis being entirely on the potential benefits to poor smallholder producers (e.g. Figure 5.5.1). Even here it may well be that value-adding innovations may be of significant benefit to</p>	<p>We agree that the benefits of market-oriented development accrue most immediately and directly to producers, and the stated CRP 3.5 focus will be to ensure that poorer smallholder farmers are engaged in and benefit from these value chains, particularly women. However, this need not imply that the grain is solely intended for high-priced specialty markets that are beyond the reach of poor consumers. The majority of the additional production of these grain legume crops is headed for the mainstream market. For example, we describe a number of market-driven successes in the second paragraph of p. 6 and on p. 24-26 that are mostly oriented towards the mainstream grain markets for the respective crops. By increasing grain availability in the mainstream market,</p>

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	<p>middle-people rather than to smallholders. However these are researchable issues that deserve to be prominent components of the agenda of this and other CRPs.</p>	<p>market-oriented development dampens grain prices which are likely to benefit the poor consumers. Our market-oriented strategy is largely grounded in the large base of global experience described in the World Bank's 2008 World Development Report "Agriculture for Development" that documents how market orientation provides an incentive for technology adoption and productivity increases leading to greater availability of food at more affordable prices, and reduced poverty (especially rural, where most of the poor live and work in agriculture).</p>
1.16	<p>Value chain analysis may be so location specific that IPGs will be difficult to generate. The proponents need to consider this more explicitly in deciding on which value chains to select for intensive research. The methodology described on p. 93 does not elaborate on this. Indeed the approach suggests that the "structure, conduct and performance" paradigm, popular with market economists in decades past will be at the forefront of the value chain analyses in this and other CRPs. It is doubtful if the CG could or should be leading this drive.</p>	<p>The comments are acknowledged and it is suggested that the following may be included as part of the methodology: Value chain analysis for all the GLs shall also include assessing the potential of the value chain to produce IPGs in order to benefit all the stakeholders, especially the smallholder farmers and the poor consumers.</p>
1.17	<p>Without better information management, research investments are wasted and SO 2 and 6 must be key parts of the solution. Prior investments to the CGIAR in the area of management of crop information and knowledge sharing have generated traction only very slowly. Estimates of the costs of redundant genetic testing worldwide, caused by inability to share information, are required to justify and revitalize this focus. (There is natural overlap between SO 2 and SO 6, with a key milestone of SO 2 listed as "Data management Centre for target grain legumes established and publicly available" for 2013). It is imperative to deliver a roadmap for the establishment of virtual breeding communities and the associated systematic interchange of</p>	<p>CRP 3.5 Grain Legumes will ensure that a good data management system is in place. Several of CRP 3.5 Grain Legumes' partners are working together in TL-I and TL-II projects. These projects have put priority and emphasis on data curation and management and sharing. CRP 3.5 Grain Legumes will greatly benefit from the ongoing efforts on standardizing formats and developing modalities for data curation and management in these and in other projects.</p>

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	information on genes and beyond. Without a roadmap for crop information management, many NARESs will continue to be left behind.	
1.18	The logistical challenges of data management and significant capacity gaps in the NARESs are not yet addressed convincingly in SO 2 and 6. To meet this challenge, some of the existing collaborative relationships within the CGIAR system will require astute management as the benefits foreshadowed under “Bioinformatics Tools for Molecular Breeding” in ICRISAT’s 2009 Annual Report have to date proved largely elusive.	There is considerable variation in the capacity of NARES in participating in data management and sharing. SO 5 will dedicate efforts on capacity building of NARES after identifying the gaps as we go along in implementing the CRP.
1.19	The current environment in which SO 2 and 6 must deliver is indeed complex and vexed, and impacted upon by higher level CGIAR issues, especially separate software systems mooted for germplasm banks on one hand and for breeding operations on the other. A concrete strategy with the will to implement seamless integration of banks with breeding operations is overdue. Better crop information management must translate to better access and better targeting of germplasm for individual users. In fact fewer, better more targeted introductions of grain legumes will be desirable for maximum impact on food security in most developing countries.	We appreciate the concern that we need a data management system that integrates databases from genebanks and breeding programs. We will examine different options, including those being developed by the Generation Challenge Program (GCP), USDA, Bioversity and others.
1.20	It is appropriate that the proponents recognize the importance of counterfactuals and attribution issues in assessing impacts (p. 93).	We do recognize the importance of counterfactuals and attribution issues; however, one requires a fair level of optimism during development of project proposals.
1.21	The impact pathways for the SOs are mostly generic and will require further elaboration as business plans are developed. There will be a renewed emphasis on regional networks as a part of these pathways to strengthen capacity building, training and knowledge sharing. This is to be applauded as networks have	As correctly pointed out, we will make sincere efforts to be specific on networks concerned when the work plans are developed. While developing the work plans, priority will be given to regional shareholders in order to strengthen their capacity.

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	waned in recent years.	
1.22	The Governance and management arrangements seem appropriate. However, as with other CRPs, the CRP Director is charged with resource mobilization efforts. This adds another layer to resource mobilization, which would seem to enlarge the problems that the CG reforms were intended to address.	The resource mobilization effort from other funding sources by CRP Director is expected to address only additional levels of resources (funding gaps). These efforts will be supported by the resource mobilization experts/consultants and coordinated with the Consortium resource mobilization efforts.
1.23	The Steering Committee (SC) and Research Management Team are introduced on Page 3 but not detailed until Page 131, where it is stated that the SC will consist of Directors General of Principal Partners and selected representation from other partners and meet twice a year, once in person and once electronically. The bureaucratic load of the reformed CGIAR is not to be under-estimated.	We will revisit the management and governance structure for CRP3.5 Grain Legumes based on the comments of ISPC and Fund Council.
1.24	The budget indicates a 25% (\$33.5 m.) gap between indicative Window 1 and 2 funding plus current bilateral funding commitments and what is proposed for 2011-13. This highlights the importance of earlier comments about the need to prioritize commodities, regions and SOs to enable hard choices to be made in the event of funding shortfalls.	The 25% gap between Window 1 and 2 (including bilateral funding) for 2011-13 is expected to be covered by additional bi-lateral projects. Concerted efforts were made to define and prioritize the legumes, regions and strategic objectives included in the proposal. The participating institutions will need to revisit the priorities on crops and regions or areas of research emphasis; based on funding availability and agreement among partners, while at the same time protecting the interests of the smallholder farmers.
1.25	The budget has included 2% for CRP management but apparently not the 4% for system overheads that presumably all CRPs were expected to provide for. There is a 16% charge for centre institutional overheads, which seems a little lower than for some other CRPs; this reinforces the need for a synthesis and review of all these charges now that all CRPs have been submitted.	We would like to suggest that the Consortium Board should compare and standardize Management costs for CRPs and the overheads (OH) in consultation with concerned CRP Lead Centers.
	The program of research undertakes to develop potential for increased production which may constitute the international	Wheat, rice and maize have received a much higher level of research and development support than other crops in the past.

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IDRC 2.1	food system's lowest hanging fruit as these are generally drought-tolerant crops where standard research approaches used for wheat, maize and rice could be applied to good effect. The program aims to achieve objectives by throwing traditional approaches at new crops; these have been understudied and the program would reverse years of underfunding for these crops with great potential.	Grain legumes have not been as fortunate in the past, but we hope that this coordinated CRP effort will allow us to push the research and development on these crops so that much more significant R4D progress can be achieved to increase the quantity and quality of production of Grain Legumes.
2.2	Opportunities for knowledge sharing between CIFSRF and CRP 3.5 should be encouraged, with research on similar crops taking place in the Sahel region and in Ethiopia.	CRP 3.5 has indicated partnerships with many national and international institutions; additional partnerships that would contribute to achieve the outputs and outcomes of CRP 3.5 are welcome and will be pursued vigorously.
2.3	Research successes from the past highlighted but it cannot be determined from the structure of the proposal which elements are part of ongoing research and what is new.	The link between ongoing or newly planned activities has likely not been clearly stated in CRP 3.5. More than 50% of the R4D efforts are for ongoing bilateral projects. However, lessons learned from past projects will be linked with the new CRP 3.5 research and development activities so that we benefit from past experiences.
2.4	The objectives appear achievable with the resources identified but as they appear to be continuations of previous work rather than novel approaches they are very "safe" choices.	The proposal builds up on past and ongoing research and development efforts. In some cases, there is continuation of efforts whereas in other cases we plan to use new tools and approaches. Research is dynamic and we hope that as technology advances we will have more tools to address current constraints and even to explore completely new areas.
2.5	The impact pathways are well designed and easy to follow.	We are pleased to hear that we have achieved simplicity and clarity in depicting Impact pathways.
2.6	Partnerships required to scale up research results are an integral part of the research program from the design stage.	Including strong research and development partnerships from the beginning has been an important strategic plan to maximize the chances of success of CRP 3.5 Grain Legumes.
2.7	The one page dedicated to exploring the innovation in the	We strongly believe that CRP 3.5 will vitalize efforts on R4D in Grain

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	program is not particularly strong in defining what the new CRP brings to the table that could not be done by the individual partners alone. Specific technological innovations that are expected as outputs from the research program are highlighted here rather than what is innovative about the CRP approach.	Legumes by bringing diverse partners together. The partners will work across institutional boundaries, share expertise across crops/regions and bring complementarities through crosscutting activities. The collective efforts and synergies created by partners would enhance efficiencies in R4D efforts and facilitate mutual leanings and technological innovations.
2.8	Gender issues are well integrated into the impact pathways.	We appreciate the comments.
2.9	This proposal is one of the few that acknowledge that when the research is successful, men often move into production areas that were previously dominated by women. Solution?	Though this is often true, we believe that Grain Legumes will continue to have greater involvement of women, particularly in production and small-scale value additions.
2.10	The recognition that much of the research should be driven by women’s demands and knowledge is explicit and appropriate given that grain legumes are often “women’s crops”	Well recognized.
2.11	Mention made of risk that governments will continue to exhibit policy bias against small farm enterprises; the risk to be managed by identifying champions at the local, regional or national government levels in the various regions. However, these risks are important and not well addressed in the program structure. “Make and they will come” approach? Links to CRP 2 could be better articulated.	We fully recognize the need of CRP 3.5 working with CRP 2 on policy advocacy for Grain Legumes. CRP 3.5 will establish and maintain regular interaction with CRP 2 and provide important inputs on legume-specific dimensions of policy, value chain analysis, and identification of new market opportunities for grain legumes to CRP 2 for developing policy advocacy for Grain Legumes.
2.12	Total budget ~ 136 million over three years; funding gap of 33 million identified	The total budget ~ 136 million over three years for CRP 3.5 is realistic considering the number of crops and regions. As indicated earlier, the funding gap of 33 million will be bridged through additional funds from bilateral projects.
2.13	Budget allocations for Strategic Objective 1 (genetic resources) for CRP 3.5 should be differentiated from the budget allocation that was made for the Gene Banks as the distinctions between	Details of budgets for different activities of SO1 on “Genetic resources and novel breeding methods” are given in Table 14.2. The resources for conservation related activities come from the

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	the two are not clear.	separate Genebank funding. We have included in the CRP budgets for characterization and identification of novel genes, genomics and enhanced utilization of genetic resources in GL crop improvement.
2.14	This is a well written, well organized and comprehensive proposal with clearly defined objectives and activities. However, it lacks ambition to go beyond the status quo. Alleviating the orphan crop syndrome is an appropriate goal for the first few years of operation. There will likely be diminishing returns from this approach and long term plan for the CRP should look beyond simply adding financial resources.	Recent developments in technological innovations, particularly in the areas of genomics, transgenics and information technology, are encouraging and will provide much needed acceleration to CRP 3.5 Grain Legumes R4D efforts. The collective efforts, mutual learning and synergies created by partners would enhance efficiencies in R4D efforts and facilitate cross- learnings and technological innovations.