

I. The Comprehensive Rural Health Project

The Comprehensive Rural Health Project (CRHP) has been providing integrated programs in health and development since 1970 to a catchment area of 500,000 people in rural Maharashtra, India. What started as a hospital has over almost fifty years expanded to include an organic demonstration farm, a preschool, an artificial limbs program, a science center, multiple training centers for international and domestic workers, a mobile health team, and a rehabilitation center. The organization also works directly with at least 30 local villages at a time, training Village Health Workers and organizing Farmers' Clubs, Adolescent Girls and Adolescent Boys Programs, Women's Self-Help Groups, and Women's Groups. All programs serve individuals regardless of gender, caste, religion, ability, or income level, although particular attention is paid to women, individuals with disabilities, lower caste individuals, children under 5, pregnant women, and newly delivered mothers.

CRHP was founded with a mission to break down injustices and mobilize communities to achieve access to healthcare and freedom from poverty, hunger, and violence. Their vision relies upon a value-based approach where every individual can enjoy all of their human rights and every family and community is robust and healthy.

II. Statement of Need: A description of Food Insecurity in Jamkhed, Maharashtra

a. Problem Statement

Moderate to severe levels of food insecurity caused by climate change, changing farming techniques, and economic policies is pervasively affecting communities in rural Maharashtra causing missed school and work, poor mental and physical health outcomes, and economic decline (Shiva, 2016). Indicators of food security that are of particular concern include high levels of nutrient deficiencies among pregnant women and adolescents, stunting and wasting of children under 5, and increasing rates of chronic diseases among adults (Seligman et al., 2010).

For the majority of the past ten years, droughts and extreme weather conditions have made farming economically challenging (Shiva, 2016). In a community where more than 70% of the population makes their living off of agriculture, food insecurity and spiraling debt have increased

significantly (Shiva, 2016). These community needs have become apparent through both formal and informal needs assessments over the past few years.

According to the World Food Summit in 1996, food security is defined as “when all people in a community have access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” From this definition emerge four key tenants of food security: food availability, food access, food utilization, and food stability (FAO, 2006). Additional, often more specific, factors in determining food security have also been identified including, but not limited to, dietary diversity, food safety, food waste, food quality, food loss, and access to financing for farmers (The Economist Group, 2019).

While some components of food security can be distinguished at an individual and household level, others are felt at a community level; in cases such as a food desert, regardless of the characteristics of the household (wealth, especially), there may not be adequate food, nutritious food, or diverse food available in the community (FAO, 2006). Therefore, while there are poorer families and lower caste families that may experience more extreme forms of food insecurity, the rural communities could likely be considered food deserts, where the entire communities would be considered food insecure for lack of access/availability to sufficient, diverse, healthful foods (FAO, 2006).

It seems, either due to gaps in the literature or actual prevalence that most nutritional deficiencies, an extreme indicator of food insecurity, are seen in adolescents, children under 5, and pregnant women in this population. According to the 2018 Global Nutrition Report, more than half of adolescents and pregnant women suffer from iron-deficiency anemia; 38% of children under 5 experience wasting; and 21% of children under 5 experience wasting all due to malnutrition, a side effect of food insecurity.

According to CRHP sources, the scale of food insecurity across most small villages in this region is widespread based on the geography, distance to larger markets, and availability to credit to rural individuals. While there are no exact published numbers demonstrating the scale and

distribution of food insecurity in the target area, anecdotally and through internal surveys administered by CRHP staff in 2016, it would seem that low to moderate food insecurity is spread out evenly with pockets of more drastic food insecurity among the poorest families living in hamlets outside the main villages.

The scope and severity of food insecurity in India, and especially in rural communities such as villages in rural Maharashtra has been defined as a problem by local healthcare organizations, including CRHP, local and state governments, village communities, media sources, and international bodies such as the Economist group and the International Food Policy Research Institute, both of whom publish international food security indices. Unfortunately, many communities are not mobilized into action due to acceptance of the condition, a feeling that the Indian Government is solely responsible for fixing the problem, and a general sense of apathy and distance towards castes and religions outside of one's own family/caste.

One popular theory for causes of food insecurity in rural villages within India includes a combination of climate change leading to more regular droughts and more frequent extreme weather events, shifts in farming practices from subsistence farming to more mechanized cash crop farming, and the changes in food availability and food prices within local food markets (Shiva, 2016).

III. Program Rationale: Best Practices to Improve Food Security in Jamkhed, Maharashtra

While food security can be addressed on an individual, family, community, or population level, best practices for the purposes of this project will focus primarily on improving food security for individuals and families. In 2013, the Lancet published a review of evidence-based best practices in improving maternal and child nutrition as a high-impact, low cost means of addressing food insecurity among the world's poor. On an individual level for women of reproductive age as well as infants and children, the interventions studied focused on preventative and curative micronutrient supplementation (primarily iron, folic acid, vitamin A, zinc, iodine, and vitamin K). On a more familial or community level, interventions were promoted for disease prevention and management such as water and sanitation projects, feeding practices for individuals with diarrhea, and disease

prophylaxis. The efficacy of various interventions was disaggregated by the delivery method, the cost of the intervention, as well as the food security of the population to come up with 10 specific best practices to address malnutrition in vulnerable populations: 1) maternal multiple micronutrient supplements to all pregnant mothers 2) calcium supplementations to mothers at-risk of low intake 3) maternal balanced energy protein supplements as needed 4) universal salt iodization 5) promotion of early, exclusive breastfeeding for 6 months; continued breastfeeding until 24 months 6) complementary feeding education 7) vitamin A supplementation between 6-59 months of age 8) preventative zinc supplements between 12-59 months of age 9) supplementary feeding for moderate acute malnutrition 10) management of severe acute malnutrition (Bhutta et al., 2013). The metanalysis found that community-based interventions, such as the use of community health workers to deliver interventions, specifically to address issues of malnutrition among rural, poor populations in developing countries were the most promising method of intervention delivery (Bhutta et al., 2013).

In 2015, Partners in Health, and associated Harvard researchers, published their pre/post test results from a 12-month intervention, called the Partners in Health Food Security and Livelihoods Program (FSLP), in three districts in Rwanda looking at food access and consumption scores among 600 rural households. The evidence-based program is based on integrated, simultaneous activities including community organizing, nutrition education, and entrepreneurship training (Nsabuwera et al., 2015). Rationale for program components came from a theoretical basis whereby food insecurity is based on logistics within the local food systems as well as household economics and purchasing power (Nsabuwera et al., 2015). For this reason, the intervention was at a household and community level, rather than at an individual nutrition level. It is apparent from the published program protocols that there were high levels of community participation, however the required inputs for the program were unclear. The Rwandan FSLP program showed highly significant results among participating families; acceptable food consumption scores improved from 48% to 64% of households and severe food insecurity decreased from 78% of households to 49% of households during the one-year program (Nsabuwera et al., 2015).

IV. Implementation Plan: Adapting Evidence-Based Practices & Programs in Rural Maharashtra

When trying to adapt any new program for CRHP, it is imperative that the program fit into the already existing infrastructure of community groups and/or activities. This integration not only saves staff time and organizational resources, but it also makes the intervention more acceptable to community members as they have built trust and understanding of already existing programs and structures.

CRHP has experience using community health workers, called VHWs at the organization, to provide interventions in health and development for more than 45 years. All 10 best-practices listed in the Lancet study revolving around providing micro and macronutrient supplementation to women of childbearing age, pregnant mothers, and children under the age of 5 will be implemented in the first year of the program for those exhibiting nutrient deficiencies while other interventions that include some prevention or health promotion piece to address food insecurity are being initiated.

It is clear that one of the first steps for any food security program will include a robust baseline analysis of current levels of food security including physical and mental health indicators, dietary diversity and consumption, and environmental and economic analyses. Validated scales, such as the ones used in Rwanda, combined with simple blood tests, will be completed with selected households in the target area. Results from this baseline survey will indicate the need for the shorter-term interventions such as supplementation for severe nutrient deficiencies which will be implemented in accordance with the 2013 Lancet article recommendations. The Mobile Health Team, who will be administering the surveys, as well as the Village Health Workers, who will be involved in administering the nutritional supplements to indicated villagers, will require additional training in accordance with medical standards and implementation fidelity.

More integrated economic, agricultural, and nutrition promotion programs, based on the FSLP studied in Rwanda, are culturally appropriate and adaptable to a rural Indian context. While the protocols were not published and the program is more time and cost intensive, the FSLP seems promising in terms of program results and future sustainability as it addresses root causes of food

security at the individual and household levels. CRHP's pilot program will include nutrition counseling paired with materials and instructions for kitchen gardens and economic classes paired with no-interest loans, in addition to initial nutrient supplementation. Because sustainable change is estimated to take at least 3 years, CRHP's program will begin with a 3-year pilot program in 3 villages with 50 randomly selected households in each village (Nsabuwera et al., 2015). The limited implementation area will cut down on the pilot program's time and monetary costs.

V. Program Narrative: Improving Food Security in Rural Maharashtra

Moderate to severe levels of food insecurity caused by climate change, changing farming techniques, and economic policies is pervasively affecting communities in rural Maharashtra causing missed school and work, poor mental and physical health outcomes, and economic decline. Indicators of food security that are of particular concern include >50% of pregnant women and adolescents suffer from iron-deficiency anemia, 21% stunting and 38% wasting experienced by children under 5, and increasing rates of chronic diseases and obesity among adults (Global Nutrition Report, 2018).

If CRHP staff are trained to conduct assessments and implement food security and nutrition programs and if baseline assessments of food security are conducted and if CRHP implements short-term interventions including nutrient supplementation for adolescents, pregnant women, and children under 5 is implemented, and if it is paired with long-term interventions that address the root causes of food insecurity such as facilitating economic empowerment groups, creating community gardens, and improving nutritional understanding, then knowledge of food security will allow for appropriate nutrient supplementation and families will have access to financial and nutritional education then family's knowledge around nutrition and healthy spending will increase, and then there will be an increase households' economic resilience and food diversity and quality intake and then individuals' health will improve. Over time, the impact from these activities combined will reduce food insecurity among populations that CRHP serves at individual, household, and community levels.

VI. Program Goals, Objectives, & Activities

Goal 1: Malnutrition will be eradicated among pregnant women, adolescents, and children under 5 in communities where CRHP works.

Process Objective 1: By July 2019, CRHP's Mobile Health Team will have finalized households for inclusion in the program as measured by written consent forms completed with 50 households in each of 3 villages selected by the organization.

Activity 1: CRHP's Mobile Health Team will complete a map for each of the 3 villages selected for the program. This map will include the assigned numbers for each household in the village.

Activity 2: The International Programs Manager will randomly select 50 households from each of the 3 villages selected from the program with a list of alternates, should some households not give consent for program participation.

Activity 3: CRHP's Mobile Health Team will obtain written and verbal consent from 50 households in each of the 3 villages selected for inclusion in the program.

Process Objective 2: By September 2019, CRHP's Mobile Health Team will have completed a baseline survey of iron-deficiency anemia, calcium deficiency, vitamin A deficiency, and zinc deficiency among all pregnant women, adolescents, and children under 5 in selected households as measured by patient records.

Activity 1: The International Programs Manager will create a written protocol in English for the Mobile Health Team to follow for biomedical testing of the selected households.

Activity 2: The International Programs Manager will purchase relevant materials needed for biomedical testing for the target population including a portable Hema Cue (hemoglobin blood testing machine), lancets, alcohol pads, registers, and writing utensils.

Activity 3: The International Programs Manager will train the Mobile Health Team in biomedical testing protocol.

Activity 4: The Mobile Health Team will conduct biomedical testing in all 150 selected program households following protocol.

Activity 5: The International Programs Manager will conduct random checks on the Mobile Health Team to insure adherence to protocol of biomedical testing and documentation.

Process Objective 3: By December 2019, CRHP's Mobile Health Team will have completed a follow-up test of iron-deficiency anemia, calcium deficiency, vitamin A deficiency, and zinc deficiency among previously nutrient deficient pregnant women, adolescents, and children under 5 in selected households. Completion of this objective will be measured and verified through patient records.

Activity 1: The Mobile Health Team will conduct biomedical testing with all previously nutrient deficient household members following protocol.

Activity 2: The International Programs Manager will conduct random checks on the Mobile Health Team to insure adherence to protocol of biomedical testing and documentation.

Activity 3: The International Programs Manager will computerize and analyze differences in baseline and follow-up biomedical tests.

Outcome Objective 1: More than 70% of individuals identified as having a nutrient deficiency, based on the baseline testing in July-September of 2019, will demonstrate a statistically significant improvement in their nutrient scores as of December 2019, as measured by follow up blood analysis administered in November-December 2019.

Activity 1: Village Health Workers in each program village will be given lists of all nutrient deficient patients in their villages as well as sufficient supplements for each patient.

Activity 2: 100% of individuals who demonstrate nutrient deficiencies during the baseline survey will be given oral supplements provided free of charge by CRHP and delivered at regular intervals by their local Village Health Worker from the time they are identified as nutrient deficient (between July-September 2019) until December 2019.

Activity 3: The International Programs Manager will review baseline and follow-up biomedical tests to analyze for changes in nutrient levels for individuals given supplements.

Activity 4: Village Health Workers in the pilot program will participate in a focus group regarding the supplementation, testing, procurement, administration, and patient tracking.

Goal 2: Food insecurity will be eliminated among all households in villages where CRHP works.

Process Objective 1: By September 2019, CRHP's Mobile Health Team will have completed a baseline survey of socio-economic and food insecurity indicators in program households as measured by an audit of the data management system where survey information is held.

Activity 1: The International Programs Manager will create a household survey and associated protocols in English including validated food security scales and socio-economic indicators.

Activity 2: CRHP office staff will translate and back-translate the household survey to create a final survey in Marathi.

Activity 3: The International Programs Manager will train the Mobile Health Team in household survey protocol.

Activity 4: The Mobile Health Team will conduct baseline household surveys in all 150 selected program households following protocol.

Activity 5: The International Programs Manager will conduct random checks on the Mobile Health Team to insure adherence to protocol of household survey conduction and documentation.

Process Objective 2: By November 2021, CRHP's Mobile Health Team will have completed a follow-up surveys of socio-economic and food insecurity indicators in program households. Completion of this objective will be measured and verified through 150 completed follow-up surveys.

Activity 1: The Mobile Health Team will conduct endline household surveys in all 150 selected program households following protocol.

Activity 2: The International Programs Manager will conduct random checks on the Mobile Health Team to insure adherence to protocol of household survey conduction and documentation.

Activity 3: The International Programs manager will computerize and analyze differences in baseline and follow-up household surveys.

Outcome Objective 1: More than 70% of participants will demonstrate correct knowledge of entrepreneurship concepts and use of safe spending practices following entrepreneurship classes held between September 2019 and September 2021 as measured by post-tests held after every class.

Outcome Objective 2: More than 70% of participants will demonstrate correct knowledge of nutrition concepts following nutrition classes held between September 2019 and September 2021 as measured by post-tests held after every class.

Outcome Objective 3: More than 70% of households, based on the baseline household survey conducted in July-September of 2019, will demonstrate a statistically significant improvement in their dietary diversity scores as of September 2021, as measured by follow-up household surveys administered in August-September 2021.

The following 10 activities support outcome objectives 1, 2, and 3.

Activity 1: 150 households are offered two hour-long monthly entrepreneurship classes held in central village locations between September 2019 and September 2021.

Activity 2: The Mobile Health Team creates and documents a curriculum of 24 entrepreneurship lessons in either English or Marathi.

Activity 3: The International Programs Manager creates pre/post knowledge questions to be administered by the Mobile Health Team before and after every entrepreneurship class and tracked in a register.

Activity 4: Tracking and attendance registers for entrepreneurship classes is created and maintained by the Mobile Health Team.

Activity 5: 100% of households that complete a minimum of 8 entrepreneurship classes between September 2019 and June 2020, are offered a no-interest loan between 10-20,000 INR to be paid back by August 2021.

Activity 6: 150 households are offered two hour-long monthly nutrition classes held in central village locations between September 2019 and September 2021.

Activity 7: The Mobile Health Team creates and documents a curriculum of 24 nutrition lessons in either English or Marathi.

Activity 8: The International Programs Manager creates pre/post knowledge questions to be administered by the Mobile Health Team before and after every nutrition class and tracked in a register.

Activity 9: Tracking and attendance registers for nutrition classes is created and maintained by the Mobile Health Team.

Activity 10: 100% of households that complete a minimum of 4 nutrition classes between September 2019 and February 2020 are offered kitchen garden materials and instructions. Required inputs, assumptions, external factors, outputs along with the above goals, activities, and outcomes can be seen visually in a logic model in Appendix A.

VII: Program Evaluation and Measurement Plan

An evaluation and measurement plan is crucial to both administratively learn from the process of program implementation as well as the program outcomes to determine if the pilot program should be rolled out to additional villages served by the organization. For this reason, formative and summative evaluations will be used.

A comprehensive pre-post biomedical test paired with a socio-economic and food security questionnaire will be created by the International Programs Manager and administered at the start of the pilot program between August-September 2019. The biomedical test will include tests for iron-deficiency anemia, calcium deficiency, vitamin A deficiency, and zinc deficiency and will be administered to all pregnant women, adolescents, and children under 5 in program households. Cut-

offs for nutrient deficiency will be taken from the most recent WHO guidelines for Indian or Southeast Asian populations. The follow-up post-test for biomedical indicators will occur between November and December 2019 and will only be administered for individuals who were initially found as nutrient deficient during the first biomedical test.

Formative evaluation for the biomedical indicators will include weekly random checks of implementation fidelity to testing protocol from August-September 2019 and November-December 2019. From September-December 2019, hospital and Village Health Worker registers will be checked every other week for patients with nutrient deficiencies' supplementation and complication records. Additionally, in December 2019, all Village Health Workers in the pilot program will be asked to participate in a focus group regarding the supplementation testing, procurement, administration, and patient tracking to inform future medicinal distribution at the village level. All nutrient deficient individuals will be given paper records to track their supplement intake and biomedical test results. These records will be checked for completion and accuracy by the Village Health Worker on a biweekly basis.

The a socio-economic and food security questionnaire will include indicators from the Indian Governmental Household Survey as well as from two validated food security scales: the Food Consumption Scores (FCS) and the Household Food Insecurity Access Scale (HFIAS). An additional local dietary diversity scale will be created by the International Programs Manager and included in the questionnaire. The initial baseline test for the socio-economic and food security questionnaire will take place between August-September 2019 with household heads of all 150 program households. The follow-up post-test for this questionnaire will occur between August and September 2021 and will be administered for all 150 program households. Formative evaluation for the socio-economic and food security questionnaire will include weekly random checks of implementation fidelity to testing protocol from August-September 2019 and August-September 2021.

It is also imperative to measure process, outputs, and outcomes for specific program activities including the entrepreneurship classes, nutrition classes, kitchen gardens, and no-interest loans. For

the entrepreneurship and nutrition classes, attendance registers will be created in September 2021 and will be completed at the end of each class. “Yes/No” knowledge pre-post tests will be created in Marathi for every educational class and will be administered and tracked by the Mobile Health Team orally at the beginning and end of each class session. In accordance with the attendance registers, families who have attended at least 8 entrepreneurship classes between September 2019 and June 2020, are offered a no-interest loan between 10-20,000 INR to be paid back by August 2021. Each family who takes out a loan will be given paper records to track their payments and use of loans. The Mobile Health Team will track families’ payments on loans in a register at the beginning of every entrepreneurship class at which point they will also check families’ records for accuracy. In accordance with the attendance registers, families who have attended at least 4 nutrition classes between September 2019 and February 2020, will be given materials and instructions on building and maintaining kitchen gardens. Kitchen garden materials given will be tracked by the Mobile Health Team using a checklist created for each family. The Mobile Health Team will be responsible for checking in with families during nutrition classes regarding the success and challenges of the kitchen gardens. This feedback will be written in English and turned in to the International Programs Manager bi-monthly February 2020-September 2021 for review and adjustments.

VIII: Budget Summary

Because the first year has many costs associated with baseline surveys as well as activities that are not included in years two and three, such as nutrient supplementation, the line item budgets and budget summaries have been separated into Year 1 and Year 2 and 3 combined.

Year 1: CRHP’s 3- Year Pilot Food Security Program Budget Summary

Budgeted Item	Amount Requested	Amount Matched	Amount In-Kind	Totals
Personnel Costs	\$10,425	\$4,800	\$8,400	\$23,625
Other Direct Costs	\$10,636	\$3,650	\$320	\$14,606
Indirect Costs	\$3,823		\$0	\$3,823
Total Costs	\$24,884	\$8,450	\$8,720	\$42,054

Years 2&3 Combined: CRHP's 3- Year Pilot Food Security Program Budget Summary

Budgeted Item	Amount Requested	Amount Matched	Amount In-Kind	Totals
Personnel Costs	\$20,850	-	\$26,400	\$47,250
Other Direct Costs	\$33,380	-	\$600	\$33,980
Indirect Costs	\$8,123	-	-	\$8,123
Total Costs	\$62,353	-	\$27,000	\$89,353

The projected total costs for activities for the first year is \$42,054. All matching items in this year are from Fulbright research being conducted as part of this project. The largest costs for all years come from personnel costs as activities for this program is likely to take a significant amount of staff time. Direct costs in year 1 come primarily from testing equipment, consumables, and supplements as well as curriculum development. In years 2 and 3 the majority of the direct costs come from nutrition garden materials and no-interest loans to families participating in the education activities of the program. Indirect costs have been calculated at 10% of the direct costs and will cover administrative expenses and overheads. More detailed information regarding the budget as well as the budget narrative can be found in Appendices D and E.

IX: Work Plans

Please see Appendices B for details regarding planning, implementation, and evaluation of program activities for CRHP's 3- Year Pilot Food Security Program. Appendix C outlines the implementation timeline specifically for activities for which the Mobile Health Team is responsible because this staff group has many responsibilities with different projects during any given year. This Gantt chart will help the Mobile Health Team better plan their responsibilities

X: Conclusion

Moderate to severe levels of food insecurity caused by climate change, changing farming techniques, and economic policies is pervasively affecting communities in rural Maharashtra causing missed school and work, poor mental and physical health outcomes, and economic decline (Shiva, 2016). Indicators of food security that are of particular concern include high levels of nutrient deficiencies among pregnant women and adolescents, stunting and wasting of children under 5, and

increasing rates of chronic diseases among adults (Seligman et al., 2010). Evidence-based practice has shown proven effectiveness in reducing nutrient deficiencies through monitoring and supplementation for individuals with such deficiencies. By following protocols outlined by a 2013 review of published evidence-based best practices by the Lancet, CRHP hopes to significantly reduce nutrient deficiencies among families included in the pilot program. Preliminary evidence from Partners in Health Food Security and Livelihoods Program (FSLP) shows that integrated efforts in nutritional education and entrepreneurship along with resources can lead to significant improvements in household food security. CRHP hopes to see similar results in household food security following nutrition and entrepreneurship education, the creation of household nutrition gardens, and provision of no-interest loans to eligible families. By combining short and long-term strategies, CRHP hopes to have a significant and sustainable impact on household food security in the 150 pilot households involved in this program.

References

- 2018 Global Nutrition Report. (2018, December 11). Retrieved February 13, 2019, from <https://globalnutritionreport.org/reports/global-nutrition-report-2018/>
- Bhutta, Z. A., Das, J. K., Rizvi, A., Gaffey, M. F., Walker, N., Horton, S., . . . Black, R. E. (2013). Evidence-based interventions for improvement of maternal and child nutrition: What can be done and at what cost? *The Lancet*, *382*(9890), 452-477. doi:10.1016/S0140-6736(13)60996-4
- IFPRI. (2008). India State Hunger Index. Retrieved January 27, 2019, from <http://www.foodsecurityportal.org/test-1>
- Nsabuwera, V., Hedt-Gauthier, B., Khogali, M., Edginton, M., Hinderaker, S. G., Nisingizwe, M. P., Tihabyona, J., Sikubwabo, B., Sembagare, S., Habinshuti, A., ... Drobac, P. (2015). Making progress towards food security: evidence from an intervention in three rural districts of Rwanda. *Public health nutrition*, *19*(7), 1296-304.
- Seligman, H. K., Laraia, B. A., & Kushel, M. B. (2010). Food insecurity is associated with chronic disease among low-income NHANES participants. *The Journal of nutrition*, *140*(2), 304-10.
- Shiva, V. (2016). *Stolen harvest: The hijacking of the global food supply*. Lexington, KY: University Press Of Kentucky.
- The Global Food Security Index. (n.d.). Retrieved January 27, 2019, from <https://foodsecurityindex.eiu.com/Country/Details#India>

<p>Problem Statement: Moderate to severe levels of food insecurity caused by climate change, changing farming techniques, and economic policies is pervasively affecting communities in rural Maharashtra causing missed school and work, poor mental and physical health outcomes, and economic decline (Shiva, 2016). Indicators of food security that are of particular concern include high levels of nutrient deficiencies among pregnant women and adolescents, stunting and wasting of children under 5, and increasing rates of chronic diseases among adults (Seligman et al., 2010).</p>		<p>Program Goals: 1) Malnutrition will be eradicated among pregnant women, adolescents, and children under 5 in communities where CRHP works. 2) Food insecurity will be eliminated among all households in villages where CRHP works.</p>	
Inputs	Activities	Outputs	Outcomes
<p>Target Population: - Organizational goodwill in surrounding villages - 150 households willing to participate in Pilot Program</p> <p>Resources/Inputs: - Funding for food security program - Mobile Health Team (MHT)- 5 staff each with 10 hours/week for 2 years - Village Health Workers (VHWs)- 6 (2 per program village), each with 15 hours/week for 2 years - 1 Computer, 5 tablets, 3 internet cubes for tracking and inputting data from pre/post-tests & surveys - Biomedical resources (lancets, cotton, alcohol, vials, reagents) for biomedical pre/post-test as well as supplements for identified nutrient deficient patients - Evidence-based research and library materials on nutrition and entrepreneurship</p>	<p><u>Administration and M&E</u> - MHT maps out all households in 3 pre-selected Program Villages - 150 households are randomly selected for participation - MHT gains informed consent for participation (including biomedical tests and surveys) from all 150 households - Develop biomedical pre/post-test with protocols and registers - Procure any biomedical supplies not already held at CRHP's Hospital - Develop socio-economic and food security survey with protocols and registers - Conduct baseline assessment of 150 participating households (including biomedical testing and food security survey) - Conduct follow-up biomedical testing with patients 4 months after baseline biomedical tests - Conduct socio-economic and food security survey post-test with 150 participating households 2 years after baseline survey</p> <p><u>Supplementation</u> - Based on baseline biomedical tests, all nutrient deficient individuals will be identified by village - Assign each VHW nutrient deficient patients to track and provide supplements - CRHP's Hospital provides necessary supplements to VHWs - VHWs deliver supplements to patients and track adherence in registers</p> <p><u>Entrepreneurship</u> - Develop entrepreneurship curriculum with associated pre-post knowledge tests - Make class attendance register - MHT hosts 24 entrepreneurship classes in villages - MHT administers pre-test before every entrepreneurship class and post-test after every entrepreneurship class - MHT gives 10-20,000 INR no-interest loans to participating households who meet criteria - MHT tracks repayments on loans</p> <p><u>Nutrition</u> - Develop nutrition curriculum with associated pre-post knowledge tests - Make class attendance register - MHT hosts 24 nutrition classes in villages - MHT administers pre-test before every nutrition class and post-test after every nutrition class - MHT gives nutrition garden materials and instructions to participating households who meet criteria - MHT tracks feedback on nutrition garden implementation</p>	<p>- 3 village maps - 150 households randomly selected (50 per village) - 150 written & signed informed consent forms from household heads - 1 developed biomedical pre/post-test with protocols + 5 registers - 1 developed socio-economic/food security survey - 150 completed baseline biomedical and socio-economic/ food security surveys - completed patient lists with nutrient deficiencies per village (3) - 400 completed biomedical posts tests from N nutrient deficient patients - Weekly nutrient supplements administered to 400 patients - 24 entrepreneurship classes administered - 24 nutrition classes administered - 125 no interest loans given - 120 kitchen garden materials given - 150 completed socio-economic/ food security post-test surveys</p>	<p>Knowledge, Beliefs, Attitudes, Skills: - Increased knowledge about nutrition topics. - Increased knowledge of entrepreneurship topics.</p> <p>Behavior: - Increased household dietary diversity. - Increased safe household spending and savings practices.</p> <p>Status/Condition: - Increased food security among households. - Decreased acute and chronic malnutrition among pregnant women, adolescents, and children under 5.</p>
<p>Program Assumptions: Evidence-based nutrient supplements available are well suited to patients' needs and lifestyles Program model and timeline has validity.</p>		<p>Program External Factors: Weather does not impede activities in terms of organization's capacities or participants' willingness to participate, selected households do not migrate for a significant amount of time, and continued low turnover of CRHP staff and VHWs.</p>	

Appendix B: Time & Task Chart Pilot 3-Year CRHP Food Security Program

Objective	Activity	Responsibility	Start Date	End Date	Related Method of Evaluation
GI.P1	Complete a map for each of the 3 villages selected for the program	Mobile Health Team	June 2019	June 2019	Village Maps
GI.P1	Randomly select 50 households from each of the 3 villages selected from the program with a list of alternates	International Programs Manager	June 2019	June 2019	List of Participating Households
GI.P1	Obtain written and verbal consent from 150 households selected for inclusion	Mobile Health Team	June 2019	July 2019	Completed Consent Forms
GI.P2	Create a written protocol in English for the Mobile Health Team for biomedical testing of the selected households	International Programs Manager	June 2019	July 2019	Written Protocol
GI.P2	Purchase relevant materials needed for biomedical testing	International Programs Manager	July 2019	August 2019	Materials Register
GI.P2	Train the Mobile Health Team in biomedical testing protocol	International Programs Manager	August 2019	August 2019	-
GI.P2	Conduct biomedical testing in all 150 selected program households	Mobile Health Team	August 2019	September 2019	Hospital Registers
GI.P2	Conduct random checks on the Mobile Health Team to insure adherence to protocol of biomedical testing and documentation	International Programs Manager	August 2019	September 2019	-
GI.P3	Conduct biomedical testing with all previously nutrient deficient household members	Mobile Health Team	November 2019	December 2019	Hospital Registers
GI.P3	Conduct random checks on the Mobile Health Team to insure adherence to protocol of biomedical testing and documentation	International Programs Manager	November 2019	December 2019	-
GI.P3	Computerize and analyze differences in baseline and follow-up biomedical tests	International Programs Manager	December 2019	December 2019	Database
GI.O1	Give Village Health Workers lists of all nutrient deficient patients in their villages as well as sufficient supplements for each patient	Mobile Health Team	August 2019	December 2019	Patient Lists
GI.O1	Give oral supplements to nutrient deficient patients	Village Health Workers	August 2019	December 2019	Materials Registers
GI.O1	Review baseline and follow-up biomedical tests to analyze for changes in nutrient levels for individuals given supplements	International Programs Manager	November 2019	December 2019	Database
GI.O1	Participate in a focus group regarding the supplementation, testing, procurement, administration, and patient tracking	Village Health Workers	December 2019	December 2019	Focus Group Notes

G2.P1	Create a household survey and associated protocols in English including validated food security scales and socio-economic indicators.	International Programs Manager	July 2019	July 2019	Written Protocols
G2.P1	Train the Mobile Health Team in household survey protocol	International Programs Manager	July 2019	August 2019	-
G2.P1 G2.P2	Conduct baseline household surveys in all 150 selected households	Mobile Health Team	August 2019	September 2019	Baseline Surveys
G2.P1 G2.P2	Conduct final household surveys in all 150 selected households	Mobile Health Team	October 2021	November 2021	Endline Surveys
G2.P1 G2.P2	Conduct random checks on the Mobile Health Team to insure adherence to protocol of household survey conduction and documentation	International Programs Manager	August 2019	September 2021	-
G2.P2	Computerize and analyze differences in baseline and follow-up household surveys	International Programs Manager	August 2019	September 2021	Database
G2.O1.O2. O3	Conduct monthly entrepreneurship classes held in central village locations	Mobile Health Team	September 2019	September 2021	Class Attendance Registers
G2.O1.O2. O3	Create and document a curriculum of 24 entrepreneurship lessons	Mobile Health Team	July 2019	September 2019	Written Curriculum
G2.O1.O2. O3	Create pre/post survey to be administered before and after every entrepreneurship class	International Programs Manager	September 2019	September 2019	Written pre/post surveys
G2.O1.O2. O3	Tracking and attendance registers for entrepreneurship classes is created and maintained	Mobile Health Team	September 2019	September 2021	Tracking and Attendance Registers
G2.O1.O2. O3	Offer a no-interest loan between 10-20,000 INR to qualifying program households	Mobile Health Team	June 2020	June 2020	Loan Registers
G2.O1.O2. O3	Conduct monthly nutrition classes held in central village locations	Mobile Health Team	September 2019	September 2021	Class Attendance Registers
G2.O1.O2. O3	Create and document a curriculum of 24 nutrition lessons	Mobile Health Team	July 2019	September 2021	Written Curriculum
G2.O1.O2. O3	Create pre/post survey to be administered before and after every nutrition class	International Programs Manager	September 2019	September 2019	Written pre/post surveys
G2.O1.O2. O3	Tracking and attendance registers for nutrition classes is created and maintained	Mobile Health Team	September 2019	September 2021	Tracking and Attendance Registers
G2.O1.O2. O3	Offer kitchen garden materials and instructions to qualifying program households	Mobile Health Team	February 2020	February 2020	Materials Register

G= Goal

P= Process Objective

O= Outcome Objective

Appendix C: Gantt Chart for Mobile Health Team Responsibilities in Pilot Program

Activity	2019							2020												2021											
	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Complete 3 village maps																															
Obtain written and verbal consent from participating households																															
Conduct biomedical testing																															
Conduct biomedical testing for patients																															
Give Village Health Workers patient lists and supplements																															
Conduct baseline household surveys																															
Conduct entrepreneurship classes																															
Maintain tracking and attendance registers for entrepreneurship classes																															
Offer a no-interest loan to qualifying program households																															
Conduct monthly nutrition classes																															
Maintain tracking and attendance registers for nutrition classes																															
Offer kitchen garden materials and instructions to qualifying program households																															
Conduct endline household surveys																															

Key:

	Administrative
	Monitoring & Evaluation
	Intervention Activities

Appendix D: CRHP's 3- Year Pilot Food Security Program Line Item Budget

Year 1 Budget				
Line Item	Amount Requested (Formula)	Amount Matched (Formula)	In Kind Cost (Formula/\$ Equivalent)	Total
<i>Personnel Costs</i>				
International Program Manager	\$2,400 1 FTE x \$1,000 per month x 12 months @20% Cash	\$4,800 1 FTE x \$1,000 per month x 12 months @40% Cash	\$4,800 1 FTE x \$1,000 per month x 12 months @ 40% In Kind	\$12,000
Mobile Health Team Members	\$4,500 2.5 FTE x \$150 per month x 12 months			\$4,500
Personnel Benefits	\$2,475 15% salaries			\$2,475
Intern Assistants			\$3,600 1.5 Interns FTE x \$200 per month x 12 months	\$3,600
Honorariums & Travel Stipends for Community Volunteers	\$1050 \$5 per work/day/volunteer x 35 days of work x 6 volunteers			\$1050
Total Personnel Costs	\$10,425	\$4,800	\$8,400	\$23,625
<i>Other Direct Costs</i>				
Translation Costs	\$830 \$2 per page x 415 pages			\$830
Printing Costs		\$400 \$.10 per page x 4,000 pages		\$400
Biomedical Supplies (Consumables)		\$1,800 \$3 per person x 600 people		\$1,800
Biomedical Testing Equipment		\$600 1 Hemocue @ \$600		\$600
Nutritional Supplements	\$4,800 \$3 per patient per month x 400 patients x 4 months			\$4,800
Biomedical Post-tests Consumables	\$800 \$2 per person x 400 people			\$800
Biomedical Post-tests Diesel		\$180 \$18 per day x 10 days		\$180
Curriculum Development	\$2,000 \$1,000 per curricula x 2 curricula			\$2,000
Program Materials	\$630 \$15 per training class x 14 classes x 3 villages			\$630

Food/Snacks	\$420 \$10 per training class x 14 classes x 3 villages			\$420
Diesel for Baseline Surveys		\$270 \$18 per survey day per village x 15 days		\$270
Diesel for Trainings	\$756 \$18 per class x 14 classes x 3 villages			\$756
Office Supplies	\$400 \$50 per staff member x 8 staff			\$400
Internet Costs			\$240 \$20 per month x 12 months	\$240
Diesel for Generator		\$400 \$40 per week x 10 weeks		\$400
Phone Expenses			\$80 \$10 per staff member x 8 staff	\$80
Total Other Direct Costs	\$10,636	\$3,650	\$320	\$14,606
<i>Indirect Costs</i>	10% of Direct Costs			\$3,823
Total Indirect Costs	\$3,823		\$0	\$3,823
TOTAL YEAR 1 PROGRAM COSTS	\$24,884	\$8,450	\$8,720	\$42,054

Combined Years 2 & 3 Budget

Line Item	Amount Requested (Formula)	Amount Matched (Formula)	In Kind Cost (formula/\$equivalent)	Total
<i>Personnel Costs</i>				
International Program Manager	\$4,800 1 FTE x \$1,000 per month x 24 months, exempt @20% Cash		\$19,200 1 FTE x \$1,000 per month x 24 months, exempt @80% In Kind	\$24,000
Mobile Health Team Members	\$9,000 2.5 FTE x \$150 per month x 24 months			\$9,000
Personnel Benefits	\$4,950 15% salaries			\$4,950
Intern Assistants			\$7,200 1.5 Interns FTE x \$200 per month x 24 months	\$7,200
Honorariums & Travel Stipends for Community Volunteers	\$2,100 \$5 per work/day/volunteer x 70 days of work x 6 volunteers			\$2,100
Total Personnel Costs	\$20,850		\$26,400	\$47,250
<i>Other Direct Costs</i>				
Printing Costs	\$50 \$.1 per page x 500 pages			\$50
Program Materials	\$1,530 \$15 per training class x 34 classes x 3 villages			\$1,530
Food/Snacks	\$1,020 \$10 per training class x 34 classes x 3 villages			\$1,020
No-Interest Loans	\$25,000 \$200 per household x 125 households			\$25,000
Kitchen Garden Materials	\$600 \$5 per kitchen garden x 120 households		\$600 \$5 per kitchen garden x 120 households	\$1,200
Diesel for Trainings	\$2,040 \$20 per class x 34 classes x 3 villages			\$2,040
Diesel for Post-Test Surveys	\$300 \$20 per survey day per village x 15 days			\$300
Office Supplies	\$800 \$50 per staff member x 8 staff x 2 (years)			\$800
Internet Costs	\$480 \$20 per month x 24 months			\$480
Diesel for Generator	\$400 \$40 per week x 10 weeks			\$400
Phone Expenses	\$160			\$160

	\$10 per staff member x 8 staff x 2 (years)			
Program Audit	\$1000 Per audit			\$1000
Total Other Direct Costs	\$33,380		\$600	\$33,980
<i>Indirect Costs</i>	10% of Direct Costs			\$8,123
Total Indirect Costs	\$8,123		\$0	\$8,123
TOTAL PROGRAM COSTS YEAR 2 & 3 COMBINED	\$62,353		\$27,000	\$89,353

Appendix E: CRHP's 3- Year Pilot Food Security Program Budget Narrative

Year I:

Personnel Costs: Personnel involved in the Pilot Food Security Program at CRHP include the equivalent of two and a half full time Mobile Health Team members at \$150 a month (total \$2,745), the International Programs Manager full time at \$1,000 per month (total \$12,000), interns at one and a half full time equivalents during the first year at \$200 per month (total \$3,600), and six Village Health Workers. The International Programs Manager is paid 20% in cash from CRHP, 40% from a Fulbright grant, and donates 40% part of their salary as an in-kind donation to the organization. All CRHP interns are unpaid. Wages and in-kind equivalents are paid monthly and are based on number of years worked at the organization, local wages in rural Maharashtra, and education level. Personnel benefits are only given to Mobile Health Team members and International Programs Manager as outlined in the bylaws of the organization pertaining to full time vs part time/seasonal workers at CRHP and are calculated at 15% of salaries. Village Health Workers are not directly employed by the organization; instead they are given daily honorariums based on a \$3.5 a day equivalent and travel stipend (\$1.5 per day). It is estimated that the six Village Health Workers will each spend an average of 35 days during the first year on this program. The total personnel costs for year I is \$23,625.

Other Direct Costs: Direct costs in year I come primarily from testing equipment, consumables, and supplements as well as curriculum development. As CRHP owns a hospital, they receive discounted rates which is reflected in the line item budgets biomedical testing equipment and associated consumables such as reagents, testing strips, cotton, lancets, and rubbing alcohol at \$2 per patient per patient (total \$800) as well as nutritional supplements at a at \$3 per patient per month for 4 months (total \$4,800). The only testing equipment that needs to be purchased is a hemocue, a portable machine used to measure hemoglobin, estimated to cost \$600. Curriculum development has been calculated at \$2,000 (\$1,000 for the entrepreneurship curriculum and \$1,000 for the nutrition curriculum). These costs include computer software, books, posters, and videos. Program supplies, printing, translation costs, food/snacks for nutrition and entrepreneurship classes, diesel, office supplies, internet, and phone expenses have been

calculated based on current prices found in the closest city to Jamkhed, approximately one kilometer away from the organization. Program materials include the consumables for the entrepreneurship and nutrition classes. For the first year, this includes 14 classes at \$15 per class (total \$630). The number of pages of curriculum and evaluation materials for this program that will be created in English and need to be translated into the local language Marathi is too much for the organization to handle, therefore the translation work will need to be outsourced (total \$830). Diesel for survey and trainings was calculated at \$18 per village visit which is an average diesel cost as villages are between 4 and 40 kilometers from CRHP. At 39 village visits (15 baseline survey visits, 10 post-test survey visits, and 14 nutrition/ entrepreneurship trainings), the total cost for car diesel is \$1,206. Diesel is also required for the generator at CRHP's training center to provide electricity for the personnel to work on curriculum development, planning, and evaluation for the project (\$400 for ten weeks). The total other direct costs for year 1 is \$14,606, of which \$9,806 needs to be requested or raised, \$3,650 will be matched, and \$320 can be given in kind by CRHP. All matched costs are provided in association with the International Program Manager's Fulbright research during year 1 including the printing costs, biomedical supplies, biomedical testing equipment, diesel for baseline and post-test. Because this pilot program is in addition to all current programs run by CRHP, and they have extremely limited resources, the organization cannot provide much to the budget in in-kind support.

Indirect Costs: Indirect costs (\$3,823) have been calculated at 10% of the direct costs and will cover administrative expenses and overheads, which is typically an acceptable amount as considered by granting agencies funding similar projects in developing countries. The pilot's budget per year also takes up around 10% of the organization's operating budget.

Years 2 & 3 Combined:

Personnel Costs: Personnel costs in years 2 and 3 are the same per year as year 1 (\$23,625 per year) as the program will require as much time, while activities will shift focus in the middle of the program from monitoring and evaluation to intervention activities. Because the Fulbright grant only lasts for the first year, in years 2 and 3, the International Programs Manager will be donating 80% of their salary in-kind.

The total personnel costs for years 2 and 3 combined is \$47,250 of which \$26,400 is in-kind and \$20,850 will be requested or raised from outside CRHP.

Other Direct Costs: Direct costs for years 2 and 3 come primarily from intervention activities associated with entrepreneurship and nutrition classes, kitchen gardens, and no-interest loans. Printing costs (\$.10 per page), program materials (\$15 per class), and snacks for classes (\$10 per class) have all stayed constant from year 1 and come out to \$2,600 for years 2 and 3 combined. Participating households that have completed a set number of program classes are eligible for no-interest loans (\$200 per household) and kitchen gardens (\$10 per kitchen garden). It is estimated that 125 households will receive no-interest loans (total \$25,000) and 120 households will receive kitchen gardens (\$1,200). The cost of nutrition garden supplies is based on the market value of materials in the city closest to CRHP. Because CRHP generates many of the materials necessary for kitchen gardens at their farm, the organization is donating these supplies to the program in-kind. The cost of diesel is expected to increase by roughly 5-10% a year, so the diesel cost for years 2 and 3 is averaged at \$20 per village visit. With 34 village classes and 15 days of post-test surveys between years 2 and 3, the total cost for diesel is \$2,340. Office supplies (\$50 per staff member per year), internet costs (\$20 per month), diesel necessary for the generator (\$40 per week), and phone expenses (\$10 per staff member per year) have also stayed constant from year 1. Additionally, there is a final audit budgeted for the last year that is estimated to cost \$1,000. The total other direct costs are \$33,380 for years 2 and 3 combined of which \$600 will be provided in-kind by CRHP.

Indirect Costs: Indirect costs for years 2 and 3 have been calculated at 10% of the direct costs and will cover administrative expenses and overheads (total \$8,123).