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Enhanced School Feeding with Iron Fortified Rice in Maguindanao, Philippines

Pilot Project of World Food Programme and the Ministry of Basic, Higher and Technical Education (BARMM)



31 March 2021



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Acronyms

ACRONYM	MEANING
BARMM	Bangsamoro Autonomous Region in Muslim Mindanao
BC	Bureau Circular
BLGU	barangay local government unit
CDA	Cooperative Development Authority
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DASUA	Datu Saudi Uy Ampatuan (Municipality)
DBM	Department of Budget and Management
DBS	Datu Blah Sinsuat (Municipality)
DepEd	Department of Education
DO	Department Order
DOH	Department of Health
DOST	Department of Science and Technology
DSWD	Department of Social Welfare and Development
ECs	electric cooperatives
eNNS	Enhanced National Nutrition Survey
ES	elementary school
FDA	Food and Drug Administration
FDC	Food Development Center
FNG	Fill the Nutrient Gap study
FNRI	Food and Nutrition Research Institute
FRK	fortified rice kernel
g	gram(s)
GPP	Government procurement policy
GPPB	Government Procurement Policy Board
HNU	Health and Nutrition Unit
IEC	Information, education and communication
IFR	iron-fortified rice
IRP	iron rice premix
IRR	Implementing Rules and Regulations
kg	kilogram(s)
km	kilometer(s)

Acronyms

ACRONYM	MEANING
LGU	local government unit
M&E	monitoring and evaluation
MAFAR	Ministry of Agriculture, Fisheries and Agrarian Reform
MBHTE	Ministry of Basic, Higher and Technical Education
MEAL	Monitoring, Evaluation, Accountability and Learning
mg	milligram(s)
MOOE	Maintenance and Other Operating Expenses
MOU	Memorandum of Understanding
MT	metric tonnes
NFA	National Food Authority
NFA-GMOD	National Food Authority-Grains Marketing Operations Department
NFA-TRSD	National Food Authority-Technology Resource Services Department
NGOs	non-government organizations
NNC	National Nutrition Council
NNS	National Nutrition Survey
QA	quality assurance
RA	Republic Act
RHU	rural health unit
SBFP	School-Based Feeding Program
SFP	School Feeding Program
SU	South Upi
SY	School Year(s)
TA	technical assistance
TLE	Technology and Livelihood education
TOR	Terms of Reference
TPH	tons per hour
TWG	technical working group
UNICEF	United Nations Children's Fund
WASH	water, sanitation and hygiene
WFP	World Food Programme

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Photo page 7: WFP/Maitta Rizza Pugay



Foreword

Around the world, school meals are a proven safety net for communities, helping to improve children's nutrition, their health, and their access to education. A daily school meal is a strong incentive for vulnerable families to regularly send their children to school as they provide appreciated financial contribution to households, especially like now during the COVID-19 pandemic when families face heightened economic stress.

When nutritious, locally-produced foods are used as part of the school meal, they boost farming community economies. They create demand for more diverse, nutritious food while helping to stabilize markets and support the growth of local agriculture. Overall, they play an important part of the local food system, also cultivating trust and stimulating sustainability in national education system programmes and government partnerships.

With this in mind, in 2018, WFP piloted the Homegrown School Feeding Programme (HGSF) in Maguindanao with the aim to link local agricultural production to school feeding through the purchase of locally produced school meals, ensuring that children can be provided with fresh, diverse, and affordable foods.

In 2019, WFP and the Ministry of Basic, Higher, and Technical Education (MBHTE) piloted the implementation of Iron Fortified Rice (IFR) through School Feeding in Maguindanao, BARMM. This is pursuant to Republic Act 8976 (Food Fortification Law) and Republic Act 11037 (National Feeding Law). This project aimed at demonstrating the feasibility, scalability, and sustainability of local iron fortification of rice, paving the way for the institutionalization of MBHTE's School Based Feeding Programme in BARMM.

The pilot test effectively demonstrated that iron fortified rice can be sourced and produced locally. With the strong collaboration among government partner agencies at national and local levels, and WFP, the potential of Homegrown School Feeding becoming a feasible model for scaled-up food fortification in BARMM, and eventually in the whole country, was demonstrated.

The IFR Pilot implementation was conducted in partnership with the National Food Authority-Food Development Center (NFA-FDC), Ministry of Agriculture, Fisheries and Agrarian Reform (MAFAR) and the Food and Nutrition Research Institute (FNRI) to whom WFP extends gratitude for their assistance, alongside the Provincial Government of Maguindanao and the Municipal Local Government of Datu Abdullah Sangki.

In a post-COVID-19 world, school feeding programmes are proving more of a priority investment than ever before. WFP's support does not and will not end here. We will further our commitment to support BARMM in addressing its food security and nutrition needs to achieve its vision of a self-reliant, food secure, and resilient Bangsamoro.

Now more than ever, the link between conflict and hunger and malnutrition is more evident. Food and nutrition programmes play a critical role in assuring a productive, nourished next generation, which can grow and thrive in a peaceful and stable community. Effective, forward-looking school meals programmes, provide an important step towards attaining these outcomes.



Brenda Barton
Representative and Country Director
United Nations World Food Programme

Message from MBHTE

Assalamu Alaikum Warahmatullahi wa barakatuh!

The Ministry of Basic, Higher, and Technical Education (MBHTE) aims to meritoriously administer and improve the Bangsamoro educational system, thus providing quality, holistic, and relevant education to all learners. We are not only referring to their intellectual development but also their physical and mental growth. Undoubtedly, it would be difficult for students to complete their lessons if they are not healthy. The MBHTE, therefore, promotes healthy eating habits through our school-based feeding program (SBFP) to ensure our students are consuming food with the proper nutritional value; we need to guarantee that they are well-educated and in good health.

To ensure that no Bangsamoro learner gets left behind, the Ministry invests in a comprehensive health program in Bangsamoro schools as per our 12-point priority agenda. This commitment to Bangsamoro learners' well-being is critical, especially when the world is dealing with the Covid-19 pandemic. In addition to the current programs of the BARMM government, we are also thankful for the support provided by our partners to deal with health issues and micronutrient deficiency in the Bangsamoro region. One example of a significant initiative is the Iron-Fortified Rice for School Feeding Program between the MBHTE and the World Food Programme (WFP).

With assistance from the WFP, the MBHTE pilot tested the use of iron-fortified rice in selected schools in Maguindanao and sourced out the rice from the local farmers pursuant to Republic Act 11037 (National Feeding Law). The Iron-Fortified Rice for School Feeding is an example of a program that needs to be implemented in the Bangsamoro – comprehensive, strategic, and promotes the common good. Hence, the Ministry had incorporated this initiative in its school-based feeding program. Indeed, education and health will help our children and young people to take on the challenges of leading the Bangsamoro nation in the future.

I want to thank the World Food Programme, the provincial and local governments of Maguindanao, and the MBHTE's Health and Nutrition Unit for spearheading this initiative. Let us continue working together towards providing a quality, inclusive, and relevant education system to our learners and successfully deliver vital services to our communities.

Sukran at mabuhay po tayong lahat!



Minister Mohagher Iqbal
The Ministry of Basic, Higher, and Technical Education
Bangsamoro Autonomous Region in Muslim Mindanao

Executive Summary

INTRODUCTION:

In 2006, the World Food Programme (WFP) re-established support in Mindanao by implementing food assistance, school feeding and sustainable livelihood projects to improve economic conditions. In 2018, WFP supported the implementation of Homegrown School Feeding in Maguindanao and conducted a Fill the Nutrition Gap study in all regions including BARMM as basis for a framework for a strengthened nutrition situation analysis and decision making on nutrition programs. Of the major indicators on factors affecting nutrition, BARMM was found to have high malnutrition prevalence – stunting at 39.9 percent among under-five and 38.7 percent among the school-aged children; and anemia at 17.3 percent and 16.9 percent among the pre-schoolers and school-aged children, respectively - according to the Enhanced National Nutrition Survey (eNNS). These figures, are particularly high in Maguindanao due to high food insecurity linked with economic barriers such as non-affordability of nutritious diet. With the approval of Republic Act (RA) 11037 on the National Feeding Program and the ongoing RA 8976 of the Food Fortification Act of 2000 mandating rice fortification with iron, WFP decided to conduct a pilot study on the use of iron fortified rice (IFR) for the school feeding program (SFP) in Maguindanao.

OBJECTIVE:

To conduct a pilot study to determine the feasibility and provide a basis for the expanded implementation on the use of IFR for the school feeding program (SFP) in Maguindanao and at the same time to improve nutritional status particularly anaemia among school children and support local food production.

METHODOLOGY:

Following the conduct of a desk review on the regulatory framework as basis for the use of IFR for SFP, WFP conducted preparatory activities starting with a planning session with stakeholders and various assessments on a) iron rice premix (IRP) supply; b) rice supply particularly among the small scale farmers within the community; c) blending equipment for the production of IFR; and d) school faculties and beneficiaries. WFP then conducted an orientation for

school administrators and students; procurement of commodities and services; determination of the blending ratio; production and delivery of iron fortified rice and monitoring.

RESULTS AND DISCUSSION:

WFP has successfully shown the feasibility of using IFR for SFP in Maguindanao for 23,000 schoolchildren in 69 schools that can be a basis for expansion in accordance with RA 11037 and RA 8976. The study objectives and challenges were addressed as follows: a) WFP was able to source the only IRP producer with necessary permits and licenses and quality control; b) increased cost due to outdated Food and Drug Administration (FDA) standard based on coated IRP, however, extensive testing was conducted using extruded IRP designed for 1:200 blending ratio enabled to use of extruded IRP to comply with FDA standard at a blending ratio of 1:100; c) NFA blending machines that were not operated for more than 10 years were revived and used for the production of IRP; d) continued perception on the unacceptable sensory and physical characteristics of IFR with coated IRP, but the use of extruded IRP resulted with no physical and sensory difference within regular rice; e) coordination and planning to ensure supply chain for IFR reaches the beneficiaries; f) the provision of 1 cup cooked IFR has provided about 2.9 mg of iron to beneficiaries; g) enabled the procurement of rice from 3 farmer cooperatives even though they lack quality requirements.

RECOMMENDATIONS:

The pilot study was able to determine the required policy and technical assistance (TA) to reduce the cost and facilitate the implementation of the use of IFR for SFP as follows: a) TA for other producers of IRP to have the necessary permits and licenses; b) approval of amended draft FDA standard for IRP; c) for NFA to revive its blending machines nationwide and provide funds for the production of IFR; d) social marketing campaign for IFR; e) TA to farmers' cooperatives to improve quality for rice and ensure their financial viability.

1. Introduction

In 2006, The World Food Programme (WFP), re-established support to conflict areas in Mindanao by implementing food assistance, school feeding and sustainable livelihood projects to improve economic conditions of the population. In 2018, WFP supported the implementation of Homegrown School Feeding in Maguindanao Province and conducted a Fill the Nutrition Gap (FNG) study nationwide among the various regions including Bangsamoro Autonomous Region of Muslim Mindanao (BARMM) which would form the basis for a framework for a strengthened nutrition situation analysis and decision making on nutrition programs. This study has been completed in 17 countries as of March 2019 and is ongoing in 7 countries. The survey determined the factors related to dietary intake from among the causes of malnutrition based on the UNICEF Framework as provided in Figure 1.

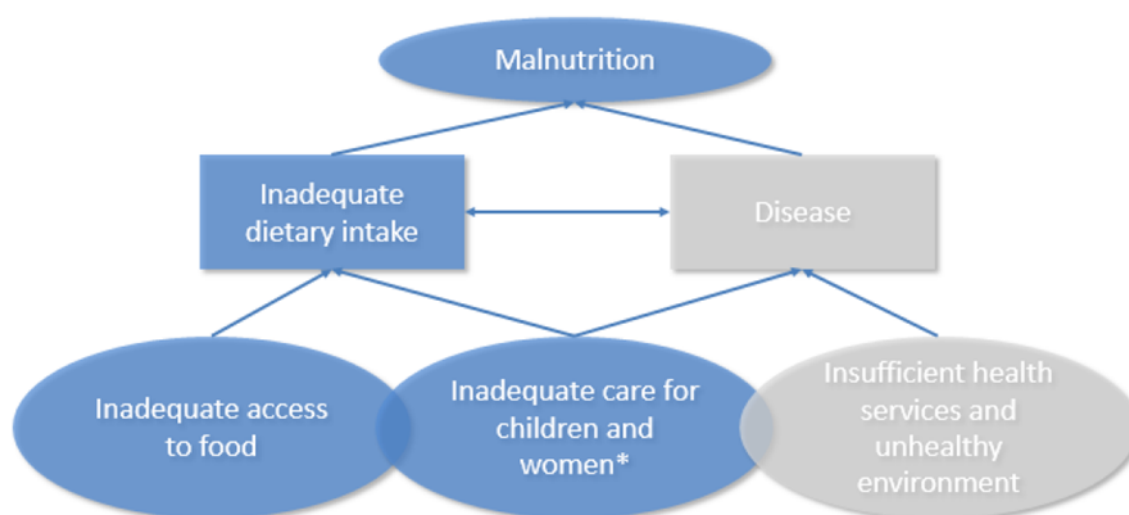


FIGURE 1. UNICEF FRAMEWORK FOR THE CAUSES OF MALNUTRITION.

Results of the FNG study shows that the factors affecting malnutrition in BARMM as compared to other regions as shown in Table 1 on the ranking of BARMM as compared to other regions.

TABLE 1. DIETARY INTAKE RELATED FACTORS AFFECTING MALNUTRITION IN BARMM.

Indicator	Results for BARMM	Ranking	Result for lowest/highest ranking region	Remarks for BARMM
Stunting (Among children under 5 years old), 2015	45%	1	23% (Region III) – lowest prevalence	Highest prevalence among regions
Median daily household food expenditure (Rural)	PHP 154.00	2	PHP 151.00 (Region X)	2 nd lowest expenditure
Median daily household Food expenditure (Urban)	PHP 155.00	1	PHP 370.00 (NCR) -highest expenditure	Lowest expenditure
Daily cost of energy-only diet	PHP 120.00	2	PHP 133.00 (NCR)	2 nd highest daily cost
Percentage of households that would not be able to afford energy-only diet	23%	1	NCR lowest at 0%	Highest among all regions
Daily cost of a nutritious diet	PHP 165.00	4	PHP 148.00 (Region V) – lowest	4 th lowest daily cost of nutritious diet
Percentage of Households that would not be able to afford a nutritious diet	58%	2	59% (Region X) – lowest	2 nd lowest daily cost

The FNG study was also based on the results of the National Nutrition Survey (NNS) of the Department of Science and Technology (DOST) – Food and Nutrition Research Institute (FNRI) of 2015. In the enhanced NNS 2018, food

insecurity continues to be a major problem in Maguindanao, highest among all provinces. It also registered high levels of malnutrition among children 5-10 years old as shown in Table 2 as compared to the national average.

TABLE 2. MALNUTRITION PREVALENCE IN MAGUINDANAO (ENNS DOST-FNRI 2018) IN COMPARISON WITH NATIONAL DATA.

Indicator	Maguindanao	Philippines	Remarks
Food Insecurity among households	85.2%	53.9%	High among poorer household (bottom 30%) and with >5 members
Stunting from 0 to 59 months	39.9%	30.3%	Stunting is high among the poor at 48% and 51.6% for pre-school and school age children respectively as compared to non-poor at 35% and 33 % respectively
Stunting 5 to 10 years old	36.5%	22.8%	
Anaemia 5 to 10 years old	16.9%	13.5%	Anaemia is high among male at 20.8% as against female at 13.1%

The Department of Education (DepEd) started a pilot study on its Breakfast Feeding Program from School Years (SY) 2010 to 2013 among malnourished schoolchildren. Results showed that 73% of the beneficiaries converted to normal nutritional status after 120 feeding days and their school attendance was at 98% with better class participation and improved good health habits. The encouraging results of the pilot feeding program resulted in the implementation of a nationwide School-Based Feeding Program (SBFP) for SY 2014-2015 that continued with DepEd Department Order (DO) 039 s. 2017 on the Operational Guidelines for the implementation of SBFP for 2017 to 2022 as guide for implementation. The SBFP targeted severely wasted and wasted school children and involved the provision of one (1) meal a day of rice and viand for 120 days to rehabilitate 80% of participants to normal nutrition status and increase school attendance from 85% to 100%. DepEd DO 039 s 2017 also encourages the serving of iron fortified rice (IFR) in support of Republic Act (RA) 8976, the Food Fortification Act of 2000 that mandates the fortification of milled rice with iron in addition to fortification of wheat flour with vitamin A and iron, cooking oil with vitamin A and refined sugar with vitamin A to address the problems on micronutrient deficiencies in vitamin A and iron. On rice fortification with iron, FNRI (Agdeppa, 2008) conducted efficacy studies of IFR using extruded iron rice premix (IRP) that used ferrous sulfate and micronized ferric pyrophosphate. Results showed similar improvement of using either fortificant with significant increases in plasma ferritin in the fortified group as compared to the control group in 6 months. On 20 June 2018, RA 11037 "An Act Institutionalizing a National Feeding Program for Undernourished Children in Public Day Care, Kindergarten and Elementary Schools to Combat Hunger and Malnutrition among Filipino Children and providing funds thereof" so called "*Masustansiyang Pagkain para sa Batang Filipino* (literally means nutritious food for the Filipino child) Act" was signed into law by President Rodrigo Roa Duterte. Under Section IV-B of RA 11037, for the School-Based Feeding Program for undernourished school children from kindergarten to Grade 6, DepEd shall provide of at least one "fortified meal" for a period of not less than 120 days in a year. As defined by RA 11037 "fortified meal" refers to a meal with deliberately increased micronutrient content to improve the nutritional quality of the food.

In 2018, there was renewed interest from the government to have a zero hunger task force to implement a National Food Policy in support of Sustainable Development Goal No. 2 on Zero Hunger and with the implementation of DepEd DO 039 s. 2017, RA 11037 and RA 8976 in place, coupled with the malnutrition problem in Maguindanao and BARMM, WFP in collaboration with the Ministry of Basic, Higher and Technical Education (MBHTE) implemented a pilot study on the use of IFR for the school feeding program (SFP) to demonstrate the feasibility of using IFR that will improve the nutritional status particularly anaemia and to provide additional income to the community through the use of rice and supplementary foods for SFP.

This report documents the results of the pilot study. It presents the activities undertaken for the pilot study, experiences in undertaking these activities, lessons learned, and recommendations for scaling up.

The report is based on project documents such as assessment reports, project brief, monitoring reports, project brief and workshop outputs and key informant interviews. The report focuses on experiences related to the use of IFR for school feeding and does not cover the other results related to nutritional status, reducing anaemia, and improving school attendance.

The report was prepared in collaboration with the Nutrition Foundation of the Philippines, while the project was undertaken with funding support from the World Food Programme.

2. Objectives

2.1 OVERALL OBJECTIVE:

To conduct a pilot study to determine the feasibility and provide a basis for the expanded implementation on the use of IFR for the school feeding program (SFP) in Maguindanao Province and at the same time, improve the nutritional status particularly anaemia among school children and support local food production.

2.2 SPECIFIC OBJECTIVES:

- 1) To determine the process that would ensure that the provision of IFR for the SFP would be in accordance with Republic Act 8976 and RA 11037 and other issuances related to the above laws by the respective Departments of the Government.
- 2) To determine the limiting and facilitating factors and address the challenges in the supply chain of iron fortified rice from the procurement, production to distribution to schools in Maguindanao.
- 3) To demonstrate the ability to procure local iron rice premix (IRP), also called fortified rice kernel in other countries, from local sources for the production of IFR based on current standards.
- 4) To demonstrate the ability to procure milled rice and other ingredients from local farmers as required by DepEd for SFP to improve the livelihood of farmers within the community.
- 5) To ensure the blending of IRP and milled rice for the production of IFR would be in accordance with the current standard.
- 6) To establish a collaborative arrangement and coordinated response among various stakeholders in the use of IFR for the school feeding program.

3. Methodology

Figure 2 shows the flowchart of the methodology in the conduct of the pilot study on the use of iron fortified rice (IFR) for the school feeding program (SFP) in Maguindanao Province based on the documentary review and key informant interviews. The following describes the step- by-step procedure in the conduct of the pilot study:

3.1 Review of relevant laws, government policies and WFP internal policies that would form the basis for the implementation of the pilot project and other relevant data.

3.2 Preparatory Activities:

- 1) Coordination meeting among government partners for the planning process. These partners included the following: MBHTE, National Food Authority-Food Development Center (NFA-FDC), Food and Nutrition Research Institute (FNRI), Food and Drug Administration (FDA), and the Ministry of Agriculture, Fisheries and Agrarian Reform (MAFAR), the Department of Education (DepEd) and the National Nutrition Council (NNC).
- 2) Review of available funding from WFP as basis for the scope of the feeding program
- 3) Joint school assessment and process review – assessed beneficiaries and school facilities required for the school feeding.
- 4) School feeding orientation – to inform on the pilot project and determine information gap among implementors and stakeholders (local government unit (LGU) including the barangay LGU, schools and parents).
- 5) Sourcing of IRP also called fortified rice kernel and analysis of potential source – conducted site visits to sources of iron rice premix.
- 6) Assessment of blending machines – conducted site visits of available blending machines from the government (NFA) and private sector.

3.3 Scoping – determination of schools and targets beneficiaries for the pilot study

- 1) Coordinate with MBHTE from the regional, district and individual schools – conducted coordination meetings with various stakeholders in the conduct of the pilot study on the use of IFR for the school feeding.
- 2) School targeting – determine schools that will be included in the pilot study including sources for the supplementary foods.

3.4 Procurement – identifying the sources and registration of vendors based on the WFP procurement process for the raw materials and services for the production of IFR.

- 1) Market assessment and vendor registration of IRP – registration of approved IRP producer
- 2) Market assessment and vendor registration of the sources of rice through the small-holders farmers evaluation of cooperatives and procurement and partnering with farmers on supplementary food source.
- 3) Vendor registration of sources of rice – registration of approved sources of rice
- 4) Laboratory testing of IRP and determination of blending ratio
- 5) Testing of rice quality and grade
- 6) Procurement process – actual procurement of IRP and rice for blending

3.5 Blending – mixing of the IRP and rice to produce IFR.

- 1) Market assessment and vendor registration for blending services – registration of NFA for services for the production of IFR
- 2) Testing of blending machine and finalization of blending ratio
- 3) Actual blending services and quality control in the production of IFR

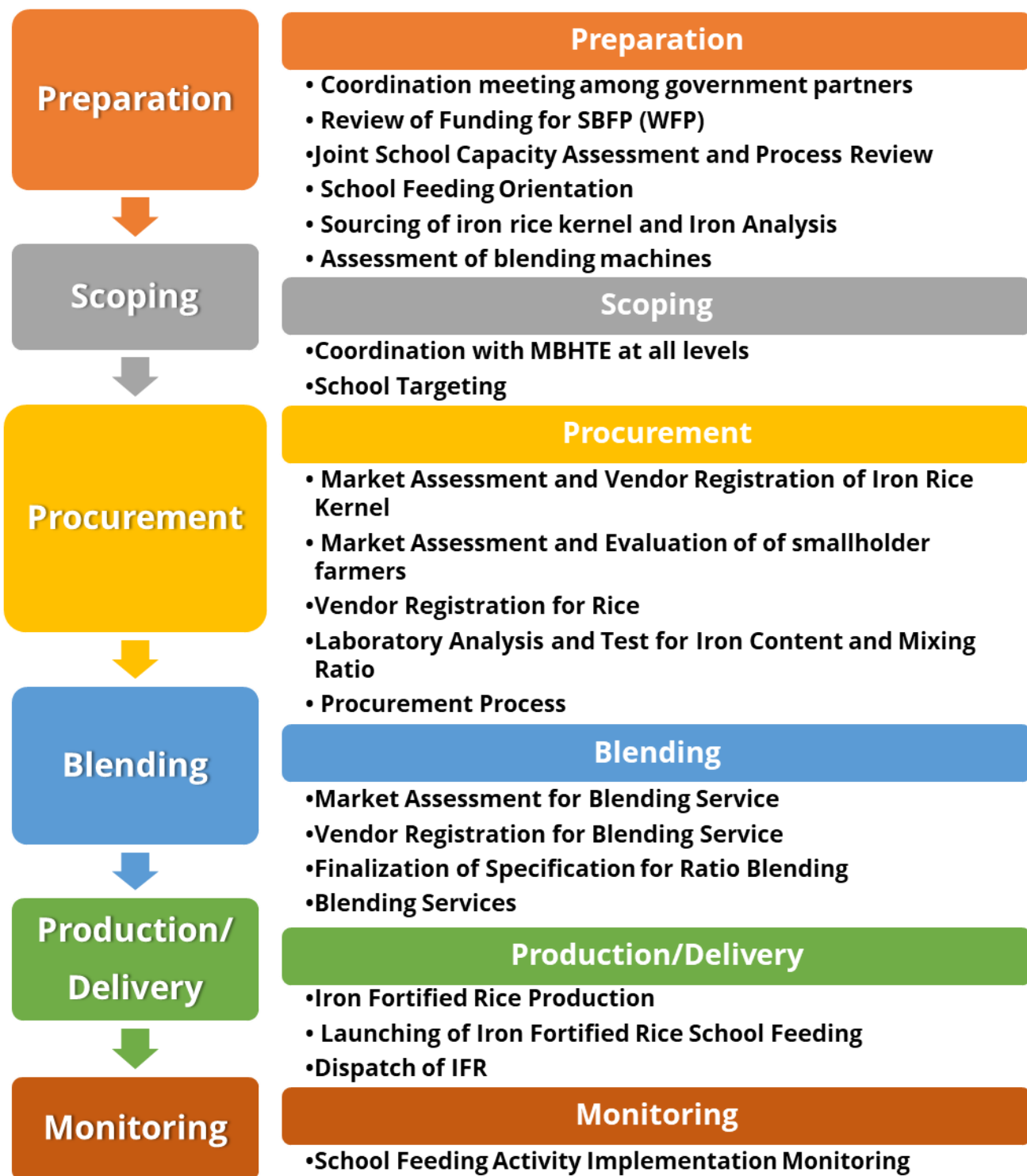
3.6 Production and delivery of iron fortified rice

- 1) Production of IFR
- 2) Launching of Iron Fortified Rice School Feeding Pilot Project
- 3) Planning and dispatch of iron fortified rice to schools

3.7 Monitoring

- 1) Monitoring in the conduct of school feeding in school districts and individual schools

FIGURE 2. FLOWCHART OF THE METHODOLOGY IN THE IMPLEMENTATION OF THE PILOT STUDY IN THE IMPLEMENTATION OF THE SCHOOL FEEDING PROGRAMME IN MAGUINDANAO PROVINCE BY WFP.



4. Discussion of Results

4.1 THE FOLLOWING PROVIDED THE REGULATORY FRAMEWORK AS THE BASIS FOR THE CONDUCT OF THE PILOT STUDY ON THE USE OF IFR FOR SFP IN MAGUINDANAO BY WFP.

- 1) Republic Act 11037, "An Act Institutionalizing a National Feeding Program for Undernourished Children in Public Day Care, Kindergarten and Elementary Schools to Combat Hunger and Malnutrition among Filipino Children and providing funds thereof" so called "*Masustansiyang Pagkain para sa Batang Filipino Act*" enacted 20 June 2018. Under Section IV-B of RA 11037, for the School-Based Feeding Program (SBFP) for undernourished school children from kindergarten to Grade 6, DepEd shall provide of at least one (1) "fortified meal" for a period of not less than 120 days in a year. As defined by RA 11037 "fortified meal" refers to a meal with deliberately increased micronutrient content to improve the nutritional quality of the food. This would mean the use of fortified foods for the National Feeding Program.
- 2) Republic Act 8976 and its Implementing Rules and Regulations (IRR), "An Act Establishing the Philippine Food Fortification Program and for other purposes" so called the Philippine Food Fortification Act of 2000", enacted 7 November 2000. The law mandates the fortification of milled rice with iron and the law's IRR requires a level of 6 to 9 milligrams of iron per 100 grams of rice. The standard was based on the coating technology for the production of iron fortified rice at the time the law was enacted.
- 3) DepEd Department Order 039 s. 2017 dated 07 August 2017, "Operational Guidelines for the Implementation of the School-Based Feeding Program 2017-2022". Under these guidelines, the SBFP Core Group tasked to implement the guidelines in schools is encouraged to serve iron fortified rice, brown rice or corn grits and vitamin enriched cooking oil and sugar in support of RA 8976 and iodized salt in support of RA 8172. The guidelines cover all aspects in the implementation of SBFP from organization and management, other health services, assessment of beneficiaries, orientation, modalities, commodities, funding requirements and liquidation among others. For school feeding, DepEd allocated sixteen pesos for the rice and viand and an additional two pesos for operational expenses per beneficiary per day.
- 4) DepEd Department Order 018 s. 2019 dated 23 July 2019, "Supplemental Guidelines for the Implementation of the School-Based Feeding Program for Fiscal Year 2019". DepEd issued supplemental guidelines in response to RA 8976. It still uses DO 039 s. 2017 as its operational guidelines but provides additional guidelines in the use of excess funds and liquidation and identifies the amount to be released per region. In addition, it emphasizes that ingredients for the school feeding shall be sourced locally such as school gardens, gardens of SBFP beneficiaries and most especially from local farmers. For school year 2019 – 2020 for Maguindanao, DepEd targeted the conduct of school feeding in 288 schools, 22,224 beneficiaries and provide P48, 003,840 in funding.
- 5) FDA Bureau Circular 2007-010 dated 10 October 2007, "Guidelines for the Initial Issuance and Renewal of License to Operate for Iron Rice Premix/Repacker/Importer and Setting Forth the Standards for Iron Rice Premix". FDA established the standards for IRP based on the standards provided in the IRR of RA 8976 that used the coating technology as basis in the production of IRP. The standard for the IRP was established at 600 mg iron up to 2,400 mg iron per 100 grams IRP to be mixed at a ratio of 1:100 to 1:400 of IRP to milled rice to give an iron content of IRP at 6 to 9 mgs iron per 100 grams IFR. Also, its moisture content should not be more than 13%. The final basis for passing the standard is the iron content of cooked IFR which should be 1 to 2 mg iron per 100 grams of cooked IFR.
- 6) Republic Act 10611, dated 23 July 2012, "An Act to Strengthen the Food Safety Regulatory System in the Country to Protect Consumer Health and to Facilitate Market Access of Local Foods and Food Products and for other purposes" so called the Food Safety Act of 2013. The law provides the food safety requirements and standards established by the Department of Agriculture (DA) and Department of Health (DOH) that ensures consumer protection and should be complied by food business operators. They are required to ensure that the food satisfies the requirements of the food law relevant to the activities in the food supply chain and that control systems are in place to reduce risks to consumers.

4.2 PREPARATORY ACTIVITIES

- 1) Coordination Meeting with Partners – various meetings were conducted with partners particularly the Ministry of Basic, Higher and Technical Education (MBHTE), National Food Authority (NFA), and the Provincial Government of Maguindanao. A School-Based Feeding Program process review workshop was conducted with MBHTE. The workshop identified the program design, expected challenges, proposed activities, action taken, and status as shown in Annex 1. WFP provided technical assistance in addressing the various challenges in the SBFP implementation.

Republic Act 11203 downsized NFA to focus on rice procurement and distribution for buffer stocks particularly with local rice from farmers and cooperatives that contributes to higher farmers' income. This could be the opportunity for NFA to request additional budget for the production and distribution of iron fortified rice in support of RA 11037 and other social safety net programmes.

In meetings with NFA, given its previous experience of providing IFR during the implementation of the Accelerated Hunger Mitigation Program from 2006 to 2010 with the provision of 1 kilo of IFR to selected schoolchildren during the term of President Gloria Macapagal Arroyo, it was at the time of the study that NFA was undergoing structural changes with the enactment of Republic Act 11203, An Act Liberalizing the Importation, Exportation and Trading of Rice, Lifting for the Purpose of Quantitative Restriction on Rice and for Other Purposes" so called the Rice Tariffication Law signed by President Rodrigo Roa Duterte on 14 February 2019. The law removes the regulatory function of NFA to the rice industry and limits its function to buffer stocking of rice. Due to the changes in NFA mandate, the request for NFA to use its blending facilities had to go to different stages as provided in Figure 4. Given this experience and with NFA blending facilities nationwide, hopefully for future requests for the use of NFA blending facilities, an operational manual should be developed that would streamline the process of using NFA blending facilities in compliance to Republic Act 9485 or the Anti Red Tape Act of 2007. Annex 3 shows the location of NFA blending machines nationwide.

- 2) Review of Funding for SBFP (WFP) – for the use of IFR for this Pilot Project, WFP had to adjust its logistics plan based on its budget as compared to the use of regular rice.
- 3) Joint School Capacity Assessment and Process Review – In August 2019, WFP conducted a business process review workshop providing the results of the joint school capacity assessment. The workshop identified gaps in the implementation of the SBFP and made recommendations that would support digital transformation as shown in Annex 1. The joint school capacity assessment, found that 16 of the 74 schools assessed lacked the facilities required to implement school feeding such as lack of water, sanitation and hygiene and kitchen facilities as shown in Annex 2. This concern was raised with the LGU and recommendations were made on possible funding sources to address the problem with the facilities in the schools through fund sources such as the 20% development fund, the special education fund among others. Also, schools with less than 50 students were not included for the school feeding due to the high cost of transportation as compared to the cost of feeding. For the business process review of the SBFP implementation the following were the major findings and recommendations:
 - Fund downloading process – complex procedures and funds downloaded too late in the school year resulting in initial period without feeding and double or triple feeding near the end of the school year to exhaust funds. There is a need to provide training on administration, management and liquidation of DepEd funds to ensure that funds are downloaded on time.
 - Vendor selection process – difficulties in sourcing vendors for commodities due to bureaucratic process particularly in rural areas and inherent inadequacies of cooperatives. A community participation procurement manual will be disseminated in April 2020 to facilitate access to small holder farmers.
 - Meal quality – lack of funds and availability of commodities for the cycle menu resulting in the lack of nutritional value of prepared meals. The use of IFR based on the WFP strategy of traditional home grown school feeding was implemented with this pilot study. Other strategies such as the Gawad Kalinga Central Kitchen Model (currently implemented on the use of IFR in Davao de Oro province) should be studied in the future on how both strategies could improve the nutritional value and limit the cost of food.
 - Kitchen infrastructure – as shown in Annex 2, there is a lack of food storage with 25 out of 69 schools having food storage for 40 or less number of sacks though this depend on the number of beneficiaries while 4 have a storage area made from wood, which is prone to infestation while only 27 out of 69 have existing functional kitchen while other schools need renovation. This problem may result in mishandling of food (food safety concern). Additional funds are requested to address this concern.
 - Reporting process – extensive manual work in the preparation of SBFP forms from school, district, division, region and national is not conducive to establishing direct linkages between the feeding and learning performance of beneficiaries. A digital reporting tool was recommended.
 - Training – staff not always familiar with key concepts and terminologies in the SBFP process. Recommended to develop training materials and conduct of training sessions.

- Motivation/Recognition – additional work for teachers and/or SBFP coordinators that requires work even after office hours. SBFP actors need to be recognized/appreciated.
- Program targeting – worry that targeting only malnourished children creates divisiveness and stigma to children and parents while children not included in the feeding were perceived to be discriminated. WFP has a policy of universal feeding since it started providing food assistance and feeding programs, which was applied in this study.
- Multiple program funding – difficulty from local administration to incorporate financial contributions for SBFP from other sources. Develop policy for local administration to have access to multiple fund sources including private sector donors.

The joint capacity assessment and business process review are important steps to ensure schools are ready to implement the use of IFR for feeding program in a safe, nutritious environment to achieve the objectives of RA 11037. This should be duplicated during the expansion on the use of IFR for SFP.

- 4) School Feeding Orientation – the orientation was conducted among the local and barangay government units, teachers and parents where it was noted that there was a lack of knowledge and awareness on the importance of IFR. Participants continue to have a perception and fear on the effect of possible unacceptable quality of IFR such as bad aftertaste and discoloured rice and “diarrhea-like” loose stools due to previous consumption of coated IRP used for IFR. Recommended to implement an information drive on IFR.
- 5) Sourcing of iron rice premix (fortified rice kernel) and iron analysis – WFP conducted plant visits of various IRP plants to ensure that the plants would be able to supply the requirements of the pilot study and at the same time the premix plants have the necessary government licenses particularly with FDA in compliance to FDA BC 2007-010. Annex 4 shows the various IRP plants assessed by WFP. Results showed that only one local producer Nutridense Corporation located in Santa Barbara, Pangasinan Province, had an FDA license with a quality control system and was actively producing at the time of the pilot study. It produces IRP using hot extrusion technology that has a high iron retention as compared to coating technology. Analysis of the IRP was conducted by the Food Development Center (FDC) then under the NFA (currently transferred to the Department of Agriculture). The IRP of Nutridense was designed for a ratio of 1:200 of premix to rice as it uses extrusion technology. However, FDA standard was based on coating technology with iron losses from 40% to 50% during the washing and cooking process as against to a maximum of 8% with the extrusion technology. To comply with the FDA standard a mixing ratio of 1:100 was used for this pilot study. This doubled the cost of the IRP for the pilot study. (See Annex 7 on the tests conducted by FDC for the IFR)

FDA has proposed an amendment to BC 2007-010 that considered the use of extrusion technology, however, a scheduled public hearing last April 2020 was postponed due to the pandemic. FDA should facilitate the approval of the revised standard to decrease the cost of iron rice premix for social safety net programs as local production of premix uses only extrusion technology. NNC and the Zero Hunger task force can assist in facilitating FDA to amend BC 2007-010.

- 6) Assessment of Blending Machines – major consideration for the blending of the IRP to rice is its proximity to target schools and local farmers’ cooperatives for the rice and with experience and technical capability in the conduct of the blending process. Based on these, the NFA blending facility in Isulan, Sultan Kudarat was identified as ideal for the pilot project.

4.3 SCOPING

Involved coordination with MBHTE at all levels and school targeting. Annex 5 is the list of schools that will be included in the pilot study. The following were the results of the scoping exercise:

- 1) Not all schools have adequate storage for the three-month supply of rice with some resorting to the use of classrooms and principal's office. Also, not all schools have sufficient and proper storage space for food commodities that makes them prone to impurities and infestation (See Annex 2). Recommended proper storage for rice and food commodities.
- 2) Accessibility of some schools due to narrow roads in far-flung areas was an issue. As shown in Annex 2, 12 schools were found to be inaccessible while 8 had limited accessibility. Thus, the LGU and MBHTE

agreed on a clustered drop-off point, with the LGU shouldering the expenses for the second leg of transport (from the clustered drop-off point to the schools). This experience shows the need to develop a delivery plan in coordination with the LGU as well as with MBHTE or DepEd during the expansion.

On the limited budget for the supply of complementary viand for the IFR, the *Gulayan sa Paaralan* project for school gardening was strengthened through a Memorandum of Agreement between MBHTE and MAFAR.

Coordination and support of the various stakeholders is critical in finding alternative solutions to ensure that schools in far-flung and hard to reach areas are included in the SBFP and strengthening the *Gulayan sa Paaralan* to increase supply for nutritious ingredients for SBF.

4.4 PROCUREMENT FOR THE SUPPLY CHAIN OF IRON FORTIFIED RICE

- 1) Market Assessment and Vendor Registration of Iron Rice Premix – from the various sources of IRP both local and imported that were evaluated (See Annex 4), WFP selected Nutridense Corporation to supply the IRP being the only supplier that has passed FDA Licensing and Registration process and producing IRP. WFP continued to support local capability in the production of iron rice kernel.

Supporting local producers of iron rice premix could provide the incentive to other investors to invest in the production of iron rice premix. Government has intensified efforts to improve nutrition through the Zero Hunger and feeding programs using IFR that would generate demand for more local production.

- 2) Market assessment and vendor registration of the sources of rice from the small-holders farmers' cooperatives

The criteria used by WFP for the supply of milled rice were as follows: a) cooperatives with farmer members to benefit the community; b) with milling machines and available stocks for the pilot; c) with government certifications and licences; d) with regular bank account. WFP in coordination with the local government of Cotabato Province and MAFAR, assessed 7 farmer cooperatives and found 4 that potentially could fulfil the requirement by WFP.

The criteria used by WFP in identifying sources of rice from farmers' cooperative were comparable to government procurement regulations. These criteria can be used by LGUs and government agencies in the procurement of rice for their social safety net programmes.

To ensure that there would be no contract delivery failures, the intent was to contract smaller tonnages from each cooperative so that in case there would be quality issues they would have a chance to either correct or exchange the lot before acceptance by WFP. Given this requirement, the procurement level would be between 10 - 30 MT per cooperative. Due to the low tonnage procured from the cooperatives, the pilot study procured additional rice from NFA which has both local and imported rice. This also enabled NFA to realize its ability to have a bigger role in school feeding and other social safety net programmes. Figure 3 shows the flowchart for the assessment of farmers' cooperatives for the supply of rice for the school feeding programme.

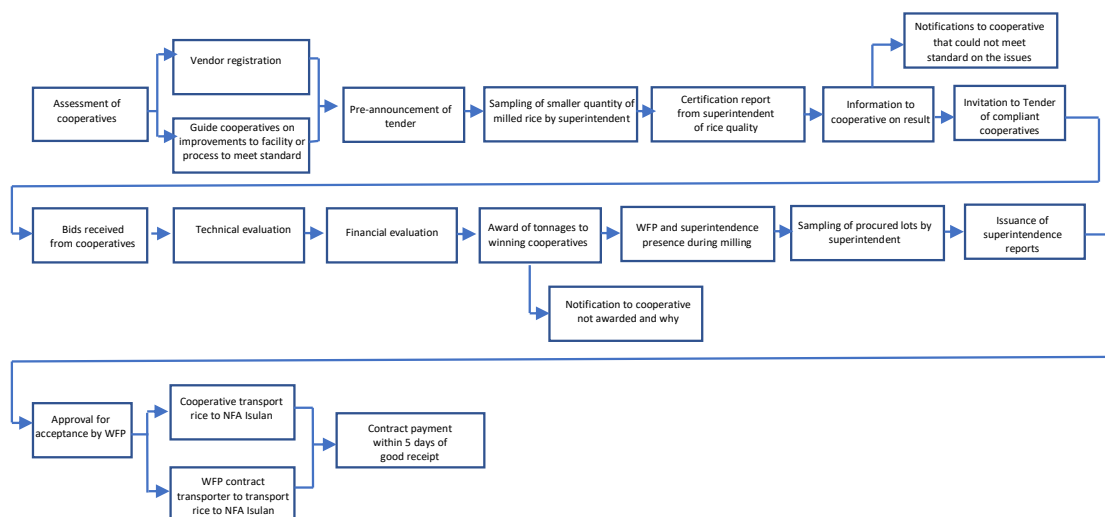


FIGURE 3. FLOWCHART FOR THE ASSESSMENT AND VENDOR REGISTRATION OF SMALL-HOLDER FARMERS' COOPERATIVES.

Following the assessment of the cooperatives, 3 were identified as possible suppliers of rice as the quality of their rice was acceptable, however the broken rice content which is the basis for grading the rice as the lower the grade the higher the price, were high at 32.73% (Grade 4), 38.12% (Grade 5) and 36.68% (Grade 5) respectively and above the $\leq 25\%$ broken grains for regular NFA rice (Grade 3). This is due to over-drying of the rice. Over-drying results in less weight and cause an increase in broken rice and loss of potential income.

Also, there was no standard calibration of weighing scales. Technical assistance should be provided to the cooperatives to assist in providing quality rice and adherence to standards that results in higher rice prices.

An opportunity exists in tapping cooperatives to supply rice and food ingredients for the SBFP as shown by the pilot study. However, cooperatives require technical assistance in post-harvest quality control, use of moisture meters and financial and licensing requirements. This can be done by DA, DAR and CDA. The Enhanced Partnership Against Hunger and Poverty (EPAHP) Program could provide a good opportunity for cooperatives to supply rice to government programs for improved and sustainable income without the middlemen.

- 3) Vendor registration for rice – Considering that there are issues on the quality of rice from the cooperatives as discussed in the previous section, WFP decided to apportion to 3 cooperatives for a total of 50 metric tonnes as part of the pilot. While the rest of the rice (250 metric tons) was supplied by NFA which may be either local or imported rice.
- 4) Laboratory Analysis and Mixing Ratio for IFR Production – the analysis of IRP was done by the Food Development Center (FDC) of NFA to determine the mixing ratio that would comply to the current FDA Standard as provided in BC 2007-010. Table 3 shows the results of FDC analysis as compared to the current FDA standard which shows that at 1:100 mixing ratio the IPR would pass the FDA standard. Annex 6 shows all the results of analysis conducted by FDA including the sensory and physical analysis showing that the iron fortified rice has no off taste, odor and appearance.

TABLE 3. RESULTS OF ANALYSIS OF IRON RICE PREMIX AS COMPARED TO FDA STANDARD.

Sample	FDC Analysis (mgs Fe/100 grams)	FDA standard (mgs Fe/100 grams)	Remarks
Iron Rice Premix	433	600 to 2,400	Below standard for mixing ratio of 1:100 to 1:400. Not a basis for passing standard. To be mixed with raw rice at 1:100 ratio.
Iron fortified Rice (Raw) Mixing Ratio 1:100	6.26	6 to 9	Within standard
Cooked iron fortified rice	1.52	1 to 2	Within standard. Final basis for passing the standard.

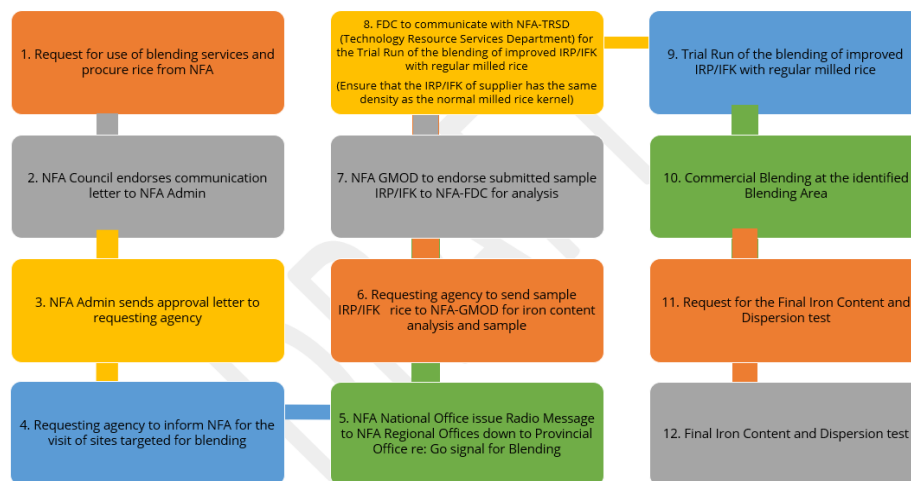
- 5) Procurement Process – following the vendor registration and determination of the mixing ratio of IRP to rice. Annex 7 shows the various costs in the supply chain for the conduct of the pilot study for the use of iron fortified rice for the school feeding in Maguindanao. Since, this is a pilot study, some cost will be higher than the actual conduct on the use of IFR for school feeding based on DepEd guidelines. For the use of IFR for the pilot study, it would cost an additional P8.45/kilo to the cost of rice to make it iron fortified including various cost on the technical assistance of WFP such as costs of testing, assessments, transport of IRP through air, personnel both by FDC and WFP, training and workshops. One cost that may be reduced was in the transport of the IRP which was transported by air instead of sea or land. For the usual IFR use for the SBFP (based on DepEd Guidelines), these would include only the cost of iron rice premix, transport cost to NFA and other blending sites and NFA blending services. In this case, the additional cost of fortification is P4.91 per kilo of IFR without WFP technical assistance at 1:100 mixing ratio.

In the proposed amendment to FDA BC 2007-010, for extrusion technology based on the results of FDA analysis, the use of the extruded IFR would pass the amended standard at a 1:200 mixing ratio and in the usual SBFP without WFP TA, the cost of fortification would be reduced in half to P2.46/kg IFR from P4.91/kg where the mixing ratio was 1:100.

4.5 BLENDING OF IRON RICE PREMIX WITH MILLED RICE TO PRODUCE IRON FORTIFIED RICE.

- 1) Market assessment and vendor registration for blending services – based on WFP assessment, NFA with its experience and technical capability of its staff in the conduct of blending was the site for the blending IRP with milled rice in Isulan, Sultan Kudarat Province. However, the blending machines have not been used for more than 10 years such that they had to be repaired, calibrated and tested for their functionality. Annex 3 shows the location of NFA blending machines nationwide, which if operational, can produce about 9.1% of the total rice to be iron fortified.
- 2) Finalization of specification of ratio for blending – based on the results of FDA analysis as shown in Table 3 and Annex 6 and the need to comply with the existing standard of FDA, BC 2007-010, the final mixing ratio used for the pilot was 1:100.
- 3) Blending Services – for NFA blending services, the cost of blending was at P700/ton if NFA rice was used and P750 if commercial rice was used. For the pilot study, following the repair and operation of the machines, calibration was necessary as it was previously calibrated at 1:200 blending using coated IFR and also the extruded IFR supplied were generally smaller grains compared to the milled rice. NFA personnel from FDC assisted in calibrating the machines. NFA should ensure that its machines are calibrated as it took some time for the calibration process and that each batch had to be checked through dispersion tests to determine if the IRP was properly distributed. The repair and calibration of NFA blending machines nationwide is important to facilitate the expansion of SBFP nationwide using IFR. Figure 4 shows the approval process for the blending of iron rice premix and milled rice at NFA as this is the first time that a private entity contracted NFA to do the blending. This process can be streamlined if blending would be a regular service of NFA and for NFA to consider a common rate for blending commercial or NFA rice especially if the rice was from cooperatives. In addition, considering that FNRI developed the extrusion technology, further studies may be needed to standardize the size of the IRP to ensure that it will be properly dispersed during the blending process.

FIGURE 4. PROCEDURE FOR THE USE OF NFA BLENDING MACHINE IN ISULAN FOR THE WFP PILOT STUDY.



**Please see Annex III for detailed process of acquisition; inputs from NFA-FDC*

The role of the Food Development Center was significant in ensuring the quality of fortification and conducting all the necessary tests including chemical, physical, sensory, and dispersion tests and calibration of NFA blending machines. One major finding was on the sensory result from its expert panel that shows cooked IFR with extruded IRP both at 1:100 and 1:200 ratio is comparable to cooked rice with no off taste and appearance which can remove the perception on the issues on the quality of IFR.

4.6 PRODUCTION AND DELIVERY OF IRON FORTIFIED RICE

- 1) Iron fortified rice production – during production of IFR, government technical personnel from NFA and FDC with WFP staff and superintendent were always present to ensure the quality of IFR. Overall, 2,880 metric tons of IFR were produced.
- 2) Launching on the use of IFR for the school feeding in Maguindanao - prior to the conduct of the launching for the use of IFR for the school feeding program in Maguindanao, WFP conducted preparatory meetings with MBHTE, LGU and school site and produced IEC materials such as briefer and video documentation for the launching event. The launching was done at Mao Elementary School where WFP also sent out a press release and social media engagement.
- 3) Dispatch of IFR – the pilot study shows the need for efficient communications between the transporter and school recipients resulting in faster offloading of rice as it arrives at distribution sites. As the trucks were loaded with multiple allocations for various schools, there was a need for multiple drop-off points that required human resources at the arrival of deliveries for faster offloading and avoiding delays. For hard-to-reach schools, the local government committed to transport the rice from the drop-off point to the schools. Data shows that different-sized schools will require different rice storage facilities. Further studies for the most cost-effective strategy to determine the most practical and safe storage facility required to minimize transport cost and clustering according to school sizes and rice requirement.

Without a study on the average consumption of cooked IFR, assuming a beneficiary is provided with 1 cup of well packed cooked rice, based on FNRI study is approximately 190.6 grams cooked rice and with a conversion factor of 0.417 is about 79 grams of raw milled rice per day. If IFR is used this could provide 2.9 mg of iron per schoolchildren as per FDC analysis. In 120 days, this totals 9.5 kilos rounded to 10 kilos rice/IFR per child per feeding cycle. This can be used to estimate total rice required by the school for the 120 days feeding cycle for its number of beneficiaries.

4.7 MONITORING

For the SBFP, 69 schools in 11 school districts were the beneficiaries. The results of monitoring are given in Annex 8. The following were the major findings:

Observed Good Practices in the Implementation of SBFP

- Some LGUs provided funds to supplement the feeding programme (purchase of vegetable and viands).
- Some schools allocated funds from monthly operational expenses to purchase the viands and utensils.
- Monitoring visits by enumerators were unannounced to the schools. This resulted in the actual observation on how the school management and parents implement the feeding program.
- Assigned parents of students per class ensured that students were well taken cared by their parents.
- School vegetable gardening projects helped supplement the nutrition needs of students and learning environment for the students on the importance of healthy lifestyles.
- Participation of parents promoted good community relationship, unity and value of helping each other for a common goal.
- Parents used hygiene materials (head net, gloves and apron).

Observed Challenges that Need Attention and Support.

- According to MBHTE personnel, some students informed that there were sensory changes with the use of IFR that reflects possible iron taste but tolerable. However, results of sensory analysis of FDC by an expert panel was reported to have no off taste and appearance of the cooked iron fortified rice and is comparable to regular cooked rice. (See Annex 6).

- The lack of proper storage rooms proved a challenge for the schools, which caused safekeeping and pilferage concerns (See Annex 2).
- There were no vegetable seeds to sustain school gardens. Majority of students belong to poor families that have limited resources. In this case, not all parents were able to contribute vegetables or other viands to complement the rice meal. In order to meet the meal requirement, instant noodles and mung beans were cooked to augment the lunch meals.
- Lack of cooking and eating utensils. In some schools, parents per class were preparing the food of their children. However, classes without cooking utensils had to wait for their turn to borrow the cooking pots of other classes that have finished cooking.
- Some elementary schools in South Upi (Binaton, Brawarbatew, Binuan, Aliman Gunsu) were using stone as stoves.
- The transportation via pump boat in far-flung schools posed risk to rice cargo should the boat capsize.
- Some schools were not aware about the duration of the project, including calculation of daily consumption.

5. Lessons Learned

The main objective of the pilot study in Maguindanao Province was to determine the feasibility and provide a basis for the expanded implementation on the use of IFR for the school feeding program and at the same time improve the nutritional status particularly anaemia among school children and support local food production. The following were the lessons learned in the accomplishment of the 3 major components of the main objective as follows:

5.1 DETERMINE THE FEASIBILITY AND PROVIDE A BASIS FOR THE EXPANDED IMPLEMENTATION ON THE USE OF IRON FORTIFIED RICE FOR THE SCHOOL FEEDING PROGRAM

The pilot project was able to demonstrate that the use of IFR for the school feeding program can be accomplished and implemented according to the regulatory framework given in Section 3.1 to 3.5. In the implementation of the project there were identified challenges that the project was able to address with recommendations to facilitate the expansion on the use of iron fortified rice in accordance to RA 11037 and other feeding programs as follows:

TABLE 4. CHALLENGES IN THE PILOT STUDY FOR THE USE OF IFR FOR SFP.

Challenges	Solution	Remarks/Recommendations
Sourcing of local supplier of IRP with necessary licenses and permits according to Government and FDA regulations.	Conducted assessments of various suppliers of IRP mostly using hot extrusion technology. Of those that were assessed only 1 was identified with FDA permits and currently operational that supplied the iron rice premix for the pilot study.	There is local capability to supply iron rice premix as required by RA 11037. This capability has to be expanded for the producers to have the necessary permits and licenses for the social safety net programs. Technical assistance for these producers of IRP must be provided that would enable them to have the licenses to ensure the products comply with quality control requirements in the production of IRP. This assistance can be provided by FNRI who developed the extrusion technology and at the same time provide access to government feeding programs to ensure their viability. FNRI can also study the standardization of premix sizes to ensure proper dispersion of the premix in
The current standards of FDA BC 2007-010 for iron rice premix were based on coating technology with high losses of iron as compared to better iron stability with extrusion technology. Using the current FDA standards increases the cost of fortification.	Following extensive testing of for the blending ratio of the IRP with rice to conform with the standards, it was agreed to adhere to current standards and produce IFR at 1:100 ratio instead of 1:200 ratio as recommended by the manufacturer and FNRI.	FDA has a draft amendment for the standards for IRP that considers IRP produced from extrusion technology that if adapted would enable the 1:200 ratio to pass the standards for IRP. FDA should immediately conduct a public hearing and approve the revised standard to decrease the cost of using IFR in compliance to RA 11037 and at the same time reduce the perceived unacceptable quality of IFR such as bad aftertaste and discoloration. NNC and the Zero Hunger Task Force can advocate to FDA to facilitate the
Changes in the mandate of NFA under DA as provided by RA 11203 reduced the role of NFA from regulatory agency for the rice industry to ensuring availability of buffer stocks during the implementation of the pilot study. Also, NFA blending machines adapted for coating technology has not been operational for more than 10 years that needed repair and calibration.	The pilot study was able to demonstrate that NFA can revive and operate its blending machines for the blending the extruded IRP with milled rice to produce IFR even if the machines have not been used for some time. The heightened role of NFA in the production and distribution of iron fortified rice would rapidly facilitate large scale introduction on the use of IFR for social safety net programs nationwide.	Given the reduced mandate of NFA due to RA 11203, it can now have a bigger role in the use of IFR for government feeding programs through the following activities: a) make operational its blending machines nationwide; b) allocate budget for its buffer stocks to be iron fortified for use for feeding programs and c) conduct staff training for the operation and quality control of IFR production. The above can be addressed through DA with NFA and FDC as their attached agencies that can be coursed through the Zero Hunger Task Force particularly for budgetary requirement.

Challenges	Solution	Remarks/Recommendations
Supply chain from procurement of IRP and rice to blending to produce IFR to delivery to schools and conduct of actual feeding.	The pilot study was able to demonstrate that proper coordination and planning among various stakeholders in the supply chain can ensure the provision of IFR for the school feeding program including schools that are hard to reach that needs to be coordinated particularly with the support of the LGU.	With careful planning and coordination, WFP was able to develop a supply chain mechanism from the IRP supplier, delivery to Mindanao/NFA, from rice sources to NFA, blending at NFA and delivery to schools that can be duplicated when the use of IFR in compliance to RA 11037 is implemented within a minimum set of standards. Minimizing costs through planning and coordination such as maximizing storage requirement through NFA or cooperative, maximizing truck loading, route planning, and LGU assistance can be done. A study on the cost-effective supply chain to optimize solutions and minimize cost is recommended including possible blending and production of IFR by
Continued perception among consumers that iron fortified rice has a bad after taste and discoloration based on previous experience with the use of coated premix for IFR and lack of knowledge and awareness on IFR.	FDC was able to demonstrate based on the results of the sensory analysis with experienced panelists of cooked IFR using extruded IRP that there is no off taste, odor and appearance at 1:100 and 1:200 ratio and comparable to regular rice. WFP conducted a launching event and produced IEC materials on the importance of IFR.	There should be an extensive information dissemination that the current extrusion technology has already addressed the issues related to the discoloration of rice and off taste due to the iron content and an IEC and social media campaign on the importance of IFR through a nationwide government effort through agencies under the Zero Hunger Task Force, NNC Governing Board where a resolution has been approved for this purpose and as part of the guidelines for RA 11037 implementation. Materials for this purpose has been developed targeting LGUs and consumers thru FNRI.
Other findings in the assessments not related to the use of iron fortified rice but equally important in the implementation of school feeding program are as follows: a) tedious process in the financial management of the SBFP funds; b) lack of facilities (storage, kitchen, WASH) and equipment in schools; c) lack of sources of supplementary foods (viand)	WFP was able to address these issues as follows: a) conduct of training on financial management particularly of government funds and auditing; b) coordinate with various stakeholders on provision of funding particularly with the LGU to upgrade facilities and equipment for the school feeding; c) coordinate with LGU and MAFAR for the improvement and provision of seeds for the <i>Gulayan sa Paaralan</i> Project and community sources for the supplementary foods.	DepEd should be able to identify implementation issues through assessment of school readiness to implement SFP and develop strategies and plans to address the issues in the implementation of the SBFP using as basis the WFP workshop outputs (Annex 1) in the SBFP implementation and monitoring (Annex 7).

5.2 IMPROVING NUTRITIONAL STATUS PARTICULARLY ANAEMIA AMONG SCHOOL CHILDREN BENEFICIARIES

Based on estimated amount of iron that was provided by the use of IFR for the pilot study, 2.9 mgs of iron can be provided for the use of IFR for SBFP assuming 1 cup of well packed rice is provided per beneficiary. This is in addition to the iron provided from the viand in the feeding program and food intake at home. This may be enough to provide the lack of iron intake if iron fortified rice is given except for 10 to 15 years old female which has a high needed iron requirement per day that may not be met by diet alone. In which case, DepEd is providing iron tablets for females in this age groups.

5.3 SUPPORTING LOCAL FOOD PRODUCTION

A major achievement of the pilot study is that WFP was able to demonstrate that it is possible to buy rice and other supplementary foods from the community through farmers' cooperatives for the school feeding program that would enable farmers to benefit economically from this initiative. A few examples on the use of IFR for the feeding program in Davao de Oro Province and Urdaneta City in Pangasinan are using commercial rice for the production of IFR. The pilot study encountered challenges in the procurement of rice from cooperatives that WFP was able to address and provide recommendations to encourage more farmers' cooperative to supply for SBFP as shown in Table 5.

TABLE 5. CHALLENGES IN THE PROCUREMENT OF RICE FROM SMALL HOLDER FARMER'S COOPERATIVES

Challenges	Solution	Recommendation
Need to improve quality of rice due to broken grains which may be due to over drying from 10% to 11% which is below the government standard of 14%. This results in loss of income due to less weight and increased broken kernels that is not within WFP and NFA standard for regular rice (25% broken) for it to be sold to NFA or WFP at a higher price.	Even if the broken rice is high compared to the 25% broken for regular NFA Rice, WFP continued with the purchase but informed the cooperative to improve quality particularly on rice drying process and need to use moisture meters for them to be considered in future requirements for rice by WFP and NFA.	Technical assistance on post-harvest quality control needs to be provided including training and provision and use of moisture meters which would enable them to be commercially viable and be part of regular government bids. This can be done through the Local Agriculture Office and DA through the DAR and Bureau of Agricultural Extension.
Weighing scales are not calibrated nor maintained to a relevant level.	Informed the cooperative on the need for the regular calibration of weighing scales. WFP used by superintendent and NFA calibrated scales to ensure relevant quantities to confirm quantities.	Technical assistance through local agriculture office to be able to understand the commercial importance of having proper scales.
Limited stocks of the cooperatives that may cause contract failures particularly related to quality issues.	WFP contracted smaller tonnages from the 3 cooperatives assessed.	Need to address quality issues to ensure products are acceptable particularly to government programs.
Used to sell rice on cash basis, which WFP and government cannot do which usually pay at 30-60 days payment terms.	WFP made arrangements to pay 5 days from delivery of the cooperatives.	Cooperatives could benefit more from being part of government program to have sustainable income such as the EPAHP. Government procurement procedures should then be adjusted to enable cooperatives to be regular suppliers such as increasing contract level to P5 million and payment terms of negotiate to a more favourable payment terms with cooperatives especially through NFA for use in rice fortification. Other options to improve viability of cooperatives is to use government or WFP contracts as collateral for bank loans so they can
Minimizing transport cost by maximizing truck load	For the pilot, WFP procured small quantities and picked up from each cooperative with a WFP staff overseeing transport planning.	Government procurement should ensure procurement from localized cooperatives to optimize truck loads to an amount that is consistent to the maximum load of trucks and at the same time minimizing distances and reduce transport cost both if transport is included in the cost for the cooperative or for the government. A supply chain study for the SFP in BARMM given the distances

6. Conclusions and Recommendations

WFP initiated the conduct of the pilot study based on the results of the National Nutrition Survey (NNS) of DOST-FNRI and its own FNG study that concluded that iron fortification in rice is a measure that needs urgent attention and practical implementation based on the objectives of RA 11037 and RA 8976 and other relevant policies and standards for rice fortification. From the results of the malnutrition prevalence and FNG study, iron fortification and rice as the country's main staple, rice fortification with iron can be considered as one of the most important intervention to gain significant ground in the shortest possible time to improve malnutrition and anaemia status. Government is aware of this from its previous attempts such as the Accelerated Hunger Mitigation Program that was stopped, but can now move forward through RA 11037 and RA 8976 to address problems experienced before on the quality of IFR with improved technology through extrusion that gives iron fortified rice with comparable sensory and physical qualities as regular rice.

The pilot study has successfully demonstrated that it was possible to use IFR for school feeding program with technical assistance and support from WFP and in collaboration with various partners particularly BARMM and MBHTE. The results of the study can be used as a guide in being able to produce IFR in accordance with standards, developing an efficient supply chain mechanism and delivering the needed iron to beneficiaries through IFR. The pilot study was able to determine the needed policy and technical assistance to facilitate the implementation on the use of IFR for school feeding and other social safety net programs as follows:

- 6.1. Provide technical assistance to other producers and suppliers of IRP to have the necessary permits and licenses as shown in Annex 4 to increase the sources of IRP according to FDA standards related to good manufacturing practices and quality of IRP. FNRI which developed the technology can assist the producers to have the necessary licenses and permits to enable the operate according to government standards. FNRI should study the standardization of premix size to ensure appropriate dispersal of the premix to the rice.
- 6.2. For FDA to facilitate and approval of amended draft standard for IRP, as almost all local premix producers manufacture extruded IRP while the current standard FDA BC 2007-010 was based on the coated IRP. The pilot study showed that if the amended standard is used, the cost for the use of extruded IRP would be reduced by 50%.
- 6.3. There should be a greater role for NFA in the production and distribution of IFR for social safety net programs. NFA has blending machines in strategic locations nationwide that have not been used for 10 years or more. The pilot study was able to show that these machines can be repaired and calibrated to provide the appropriate mixing ratio. Initially, these machines were calibrated at 1:200 ratio when it was used for coated IRP, but the pilot study was able to use the machines at 1:100 ratio using extruded IRP. If all NFA machines were operational these could produce approximately 9.1% of the Philippine total rice requirement to be iron fortified and more than enough for feeding programs as required by RA 11037. NFA should be provided with funds to rehabilitate the blending machines, train its personnel and most importantly for the procurement of IRP for the production of IFR. This would enable DepEd and other agencies with a ready source of IFR for their social safety net programs.
- 6.4. There is still the perception of teachers, parents and beneficiaries and generally among Filipinos that IFR has off-taste, produces discolored rice and stools which was due to the experiences from the rice distribution of the AHMP, which used IFR produced using the coated premix. The pilot study was able to show that an improvement in technology using extruded IRP does not produce an off-taste and discoloration of cooked IFR. There was also lack of knowledge and awareness on IFR and its benefits. A social marketing campaign for IFR should be implemented.
- 6.5 The pilot study was able to show that farmers' cooperatives within the community can be harnessed to provide rice for the production of IFR. However, the grade and quality of their rice need to be improved as well as their ability to supply according to the procurement requirements of WFP and the government. Technical assistance should be provided to farmers' cooperatives particularly on post-harvest quality control as drying and determination of broken grains. This would enable them to reduce broken grains to 25% or less to be able to supply rice to NFA at a higher price compared to selling to traders and also for use in IFR production. At the same time, the government should also revise its procurement policy to pay farmers' cooperatives at favourable terms. WFP has reduced payment terms to 5 days from delivery as a possible option, also for the government or ensure other financial terms that allow favourable bank loans. The latter has been considered in the government program on the Enhanced Partnership Against Hunger and Poverty, with a window to provide loans to farmer-participants so they can participate in the procurement of goods for feeding programs.

For the next steps in the expansion of the pilot study in BARMM, in coordination with MBHTE, WFP should continue to provide technical assistance in terms of the following: a) developing plans for the use of IFR for other BARMM provinces particularly if funds from DepEd will be made available; b) assisting in the supply chain for IFR production and distribution; c) scoping and targeting schools and beneficiaries; d) monitoring the implementation of planned activities. WFP can also consider studying a cost-effective supply chain mechanism for the use of IFR in SFP in BARMM particularly for the island provinces. This study can be used as basis for the supply chain mechanism in the nationwide implementation of SBFP.

WFP also needs to disseminate the results of the pilot study to DepEd and other stakeholders that implement social safety net programs such as DSWD and NGOs and most importantly to the Zero Hunger Task Force. From the dissemination forum, the aforementioned recommendations can be discussed and plans for their implementation developed and funded to facilitate the expansion of the use of IFR as provided by RA 11037 and other social safety net programs. This expansion could help improve the nutrition situation, particularly for anaemia, towards a more healthy and productive population.

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Annexes

ANNEX 1. POWER POINT SLIDES OF THE SBFP PROCESS REVIEW WORKSHOP OUTPUT.



OBJECTIVES:

- The purpose of the workshop is to revisit the SBFP guidelines as against the actual practice in its implementation in BARMM. This will also be the venue to identify issues/ challenges and determine actions and ways forward to strengthen its implementation and in crafting forthcoming issuances and legislations adapting or enhancing RA 11037 customized to BARMM context.
- The output of this workshop will be utilized for the development of upcoming issuances and legislations attuned to the needs of BARMM.

PROGRAM DESIGN

Challenges	Recommended Activities	Actions Taken	Status
Low Coverage: Nationally funded SBFP targets only the W and SW school aged children	Universal Feeding? Or will BARMM adopt SBFP under Block Grant	WFP assisted MBHTE in developing a concept note for School Based Feeding Program funded under block grant	Integrated in the MBHTE Plan with funding allocation from block grant Target children: 160,000 school aged children across BARMM region Funding: Php336,000,000.00
SBFP Working group not organized and no TOR develop	Create or organize SBFP working group in each level (region, province, division, school) to plan, monitor the implementation and the utilization of funds	Technical working group at the regional level was created and reviewed the BARMM school based feeding program WFP provided technical assistance on the development of SBFP Guidelines for BARMM	SBFP BARMM Guidelines for finalization
	Develop Terms of Reference for the SBFP Working Group at the regional level (this can be replicated by the province, division, schools)		for follow up
	Present the Regional SBFP TWG TOR to the Minister for approval		for follow up
SBFP for 2019 not implemented due to some constraints related to liquidation and reporting		WFP assisted MBHTE implementing school feeding using Iron Fortified Rice – Demonstration of IFR is included in the guidelines as mandated in RA 11037	For Implementation should be part of technical specifications;

COMPLEMENTARY ACTIVITIES

Challenges	Recommended Activities	Actions Taken	Status
Insufficient technical support and farm inputs from MAFAR to sustain Gulayan sa Paaralan (land preparation to harvesting/planting cycle)	<p>A. Coordinate and review with MAFAR the MOU for:</p> <ol style="list-style-type: none"> 1. allocation funds for Gulayan sa Paaralan (farm inputs such as seeds and gardening tools) 2. technical support from Land preparation to Harvesting/Planting Cycle 3. expansion to other schools <p>B. Assign a regular and fixed term Gulayan sa Paaralan Coordinator with expertise in agriculture</p> <p>In the event of any turn over at any level (eg. resignation or retirement) of GPP coordinator ensure the hand over and endorsement of all documents related to GPP to the incoming replacement or HNU/HNS/District GPP Coordinator/TLE Teacher</p> <p>C. Conduct trainings of the GPP Coordinators in the Division Offices</p>	<p>WFP workout with MAFAR the partnership with MBHTE by forging an MOU to support the school feeding implementation</p> <p>MAFAR conducted Food Security Summit together with the signing of MOU between MBHTE and MAFAR</p>	MAFAR and MBHTE forged an MOU to provide support for the school feeding implementation

FINANCING

Challenges	Recommended Activities	Actions Taken	Status
<p>Lack of ideas on government procurement process/complicated liquidation process</p> <p>Delayed downloading of funds due to different processes; multiple layers of signatories and absence of assigned focal points</p>	<p>Request GPPB to conduct orientation on government procurement policy</p> <p>Coordinate and meet DBM (Central), MBHTE-COA and MBHTE-Accounting for the fund flow</p> <p>Create/enhance Business process flow/citizen's charter regarding fund flow</p>	<p>GPP workshop was facilitated by the trained MBHTE procurement team since GPPB has not yet develop new guidelines for community participation on procurement</p> <p>WFP assisted MBHTE for the conduct of Government Procurement Policy workshop</p> <p>WFP assisted MBHTE in the development of Business Process Mapping for SBFP implementation</p>	<p>For follow up, on going finalization of document</p>

PROGRAM IMPLEMENTATION MONITORING

Challenges	Recommended Activities	Actions Taken	Status
<p>No policy and guidelines on the monitoring and evaluation</p>	<p>Formalize SBFP-Technical Working Group at the regional level to oversee the overall implementation of the SBFP</p> <p>Identify the composition of the SBFP Working Group</p> <p>SBFP TWG to develop policy and guidelines for the development of</p> <p>Develop SBFP monitoring and evaluation tool at all levels of M&E tool</p> <p>SBFP TWG to coordinate with WFP for the development of M&E tool</p> <p>Field test the M&E Tool</p> <p>Coordinate with the Minister for the approval of the SBFP M&E tool to be included in the overall M&E of MBHTE</p> <p>Orient focal person at all levels (region, province/division, district/schools) on the approved M&E tool</p>	<p>Technical Working Group was organized but the TOR is yet to be developed</p> <p>Review WINS and ODK monitoring tool</p> <p>Nutrition component to be included in the M&E Tool</p> <p>"Get monitoring tool/indicators for nutrition on school feeding"</p>	<p>Monitoring, Evaluation, Accountability and Learning (MEAL) was included in the technical assistance requested by MBHTE</p>

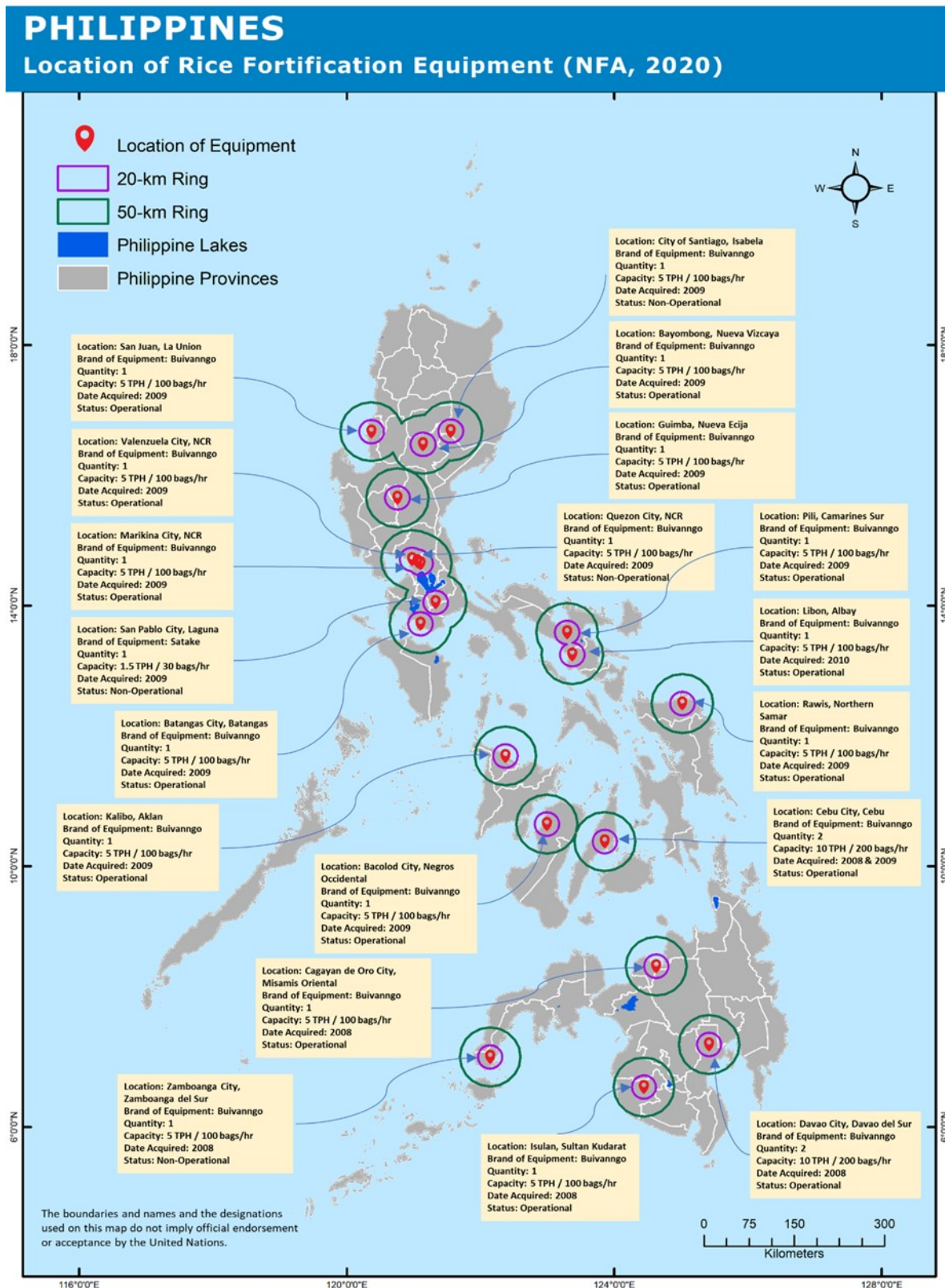
ANNEX 2. ASSESSMENT OF THE FACILITIES OF PARTICIPATING SCHOOLS OF THE WFP PILOT PROJECT.

Facility	Number of Schools	Remarks
Storage		
Capacity (number of bags)		
<20	10	
21-40	15	
41-60	26	Most common bag capacity
61-80	7	
>80	4	
Type of Structure		
Concrete	46	Most common storage structure
Semi-concrete/mixed	12	
Wood	4	
Kitchen/Cooking Area		
Existing and functional	27	
Needs improvement/rehabilitation	26	More schools need to improve on their kitchen/cooking facilities
Kitchen is in another location	3	
Under renovation	6	
Handwashing Area/Water Source		
Water source with filter/purifier	6	
Water source without filter/purifier	36	Most common water source
No potable water source or functional hand-washing area	20	
Note: 28 of the total schools have a second or alternative source of water apart from their main source		
School Garden		
Existing/functional	30	
Needs improvement/rehabilitation, under rehabilitation	26	More schools need to improve or create school gardens
Not existing	6	

Facility	Number of Schools	Remarks
Latrines		
Availability		
Existing/functional	53	Most schools have existing and functional latrines
No latrines	5	
Not functional	4	
Type of toilets		
Gender-sensitive	11	
Common toilets	33	Most schools have common toilets for boys and girls
One per classroom	9	
Road Access		
Not accessible	12	
Limited access	8	
Accessible to trucks and other vehicles	41	33 out of 41 schools are accessible to 6-wheeler trucks
School is along highway	4	
Others		
Participation of Parents-Teachers Association		
Not active	3	
Low participation	5	
Active	48	Most schools have active PTA
Very active	6	

Note: 7 out of the 69 participating schools have not been visited or assessed for this report. There are schools that have no data on some of the available facilities.

ANNEX 3. LOCATION OF NFA RICE FORTIFICATION BLENDING FACILITIES NATIONWIDE



ANNEX 4. RESULTS OF THE ASSESSMENTS OF PRODUCER AND SUPPLIERS OF IRON RICE PREMIX.

Name of Company	Address	Contact Person/Details	Remarks/Status
NUTRIDENSE FOOD MANUFACTURING CORP.	Malanay, Sta. Barbara Pangasinan	Racky D. Doctor (President) 075 600-8251 Nutridensefmc@yahoo.com.ph	A Technology adaptor of FNRI Producer of EXTRUDED Iron Rice Premix (IRP) Currently operational Has existing valid certificate from FDA With license to operate issued by FDA; compliant to Government standards
CLG HEALTH FOOD	Purok Malinawan Conel, 88 De Dios St., Lagao General Santos City	Cristina Go CLGHFPI 09177148558 09399149418	A Technology adaptor of FNRI Producer of EXTRUDED Iron Rice Premix (IRP) Currently, operational but with limited demand No product quality manuals or relevant documents for acquiring license to operate and to conform with the government standards. Need some technical support from FNRI to be further compliant to the government regulations
NUTRITION AND BEYOND CORPORATION	KM. 99 Maharlika Highway, Diversion Road San Leonardo Nueva Ecija	Mr. George Aguilar (President) 044-806-0209 nutritionbeyond545@gmail.com	A Technology adaptor of FNRI Producer of EXTRUDED Iron Rice Premix (IRP) Need some technical support from FNRI to be compliant to the government regulations Currently non-operational

Name of Company	Address	Contact Person/Details	Remarks/Status
ALHEED INTERNATIONAL TRADING CORPORATION	<p>Office: Unit 2701 Antel Global Corporate Center, Julia Vargas Ave., Ortigas Center, Pasig City, Philippines</p> <p>Warehouse: Herco Agro Industries 04 Maharlika Highway, Batali, Santiago City</p>	<p>Mr. Nelvin C. Co (VP Operations) / Alexander Co. (President)</p> <p>(02) 633-5892/ (02) 706 2300</p> <p>nelvinco@yahoo.com</p>	<p>Importer of COATED Iron Rice Premix (IRP) from USA when NFA was still active.</p> <p>Per FNRI, needs quality check</p>
DSM NUTRITIONAL PRODUCTS	Unit 1803 One Global Place, 5th Ave. Cor. 25th Street, Bonifacio Global City, 1634 Taguig Philippines	<p>Gabriel Sison</p> <p>T +63 2-553 65 06</p> <p>F +63 2-553 07 03</p> <p>M +63- 917 652 6868</p> <p>gabriel.sison@dsm.com</p>	<p>Supplier of EXTRUDED Fortified Rice Kernel (FRK)/Iron Rice Premix (IRP) and other chemicals for food fortification from Thailand.</p> <p>Currently, no license to operate in the Philippines</p>
Department of Science and Technology (DOST)	DOST Building, Gen. Santos Avenue Bicutan, Taguig City Metro Manila 1631 Philippines	<p>Sec. Fortunato de la Pena</p> <p>c/o Maria F. Tela</p> <p>T: (02) 8837 2071 to 82 Locals 2000/2003/2005 / (02)</p> <p>F: (02) 8837 2937</p> <p>osec@dost.gov.ph</p> <p>Dr. Mario Capanzana (Director-FNRI)</p> <p>T (02) 8372934</p> <p>mar_v_c@yahoo.com</p> <p>Dr. Imelda Agdeppa (NAMD)</p> <p>09175460189</p> <p>iangelesagdeppa@yahoo.com.ph</p>	<p>Will be setting up another 5 production facilities of premix (IRP) that can supply the requirements of Luzon, Visayas and Mindanao (location to be finalized)</p>

ANNEX 5. LIST OF PARTICIPATING SCHOOLS AND NUMBER OF PARTICIPANTS FOR THE WFP PILOT PROJECT IN MAGUINDANAO.

Municipality	Barangay(s)	School/RHU/ECs/Name of Project	Planned Number of Participants
AMPATUAN	Malatimon	Malatimon Elementary School	226
AMPATUAN	Saniag	Saniag Elementary School	449
AMPATUAN	Matagabong	Matagabong Elementary School	117
BULDON	Karim	Baguiangen Elementary School	215
BULDON	Dinganen	Central Edcor Elementary School	263
BULDON	Karim	Karim Elementary School	285
BULDON	Kulimpang	Kulimpang Elementary School	248
BULDON	Dinganen	Lower Dinganen Primary School	80
BULDON	Edcor (Gallego Edcor)	Makalian Elementary School	133
BULDON	Mataya	Mataya Elementary School	201
BULDON	Calaan (Pob.)	Pinadzangca Primary School	105
BULDON	Karim	Dimagalen Elementary School	264
BULDON	Edcor (Gallego Edcor)	Royod Primary School	137
BULDON	Oring	Datu Abolais Manalao Primary School	110
DATU ABDULLAH SANGKI	Banaba	Datu Sailila CElementary School	794
DATU ABDULLAH SANGKI	Dimampao	Dimampao Elementary School	511
DATU ABDULLAH SANGKI	Kaya-Kaya	Kaya-Kaya Elementary School	520
DATU ABDULLAH SANGKI	Mao	Mao Elementary School	321
DATU ABDULLAH SANGKI	Maganoy	Old Maganoy Elementary School	325
DATU ABDULLAH SANGKI	Sugadol	Sugadol Elementary School	504
DATU BLAH T. SINSUAT	Matuber	Datu Sa Biwang Elementary School	365
DATU BLAH T. SINSUAT	Penansaran	Dawat Central Elementary School	124
DATU BLAH T. SINSUAT	Nalkan	Nalkan Elementary School	276
DATU BLAH T. SINSUAT	Pura	Pura Elementary School	246
DATU ODIN SINSUAT (DINAIG)	Bagoenged	Bagoenged Elementary School	309
DATU ODIN SINSUAT (DINAIG)	Benolen	Benolen Elementary School	670

DATU ODIN SINSUAT (DINAIG)	Sifaren (Sifaran)	Sifaran Elementary School	177
DATU ODIN SINSUAT (DINAIG)	Sibuto	Sibuto Elementary School	247
DATU ODIN SINSUAT (DINAIG)	Bagoenged	Camp Ebrahim Sema Elementary School	224
DATU SAUDI- AMPATUAN	Dapiawan	Dapiawan CElementary School	1,556
DATU SAUDI- AMPATUAN	Madia	Madia Elementary School	319
DATU SAUDI- AMPATUAN	Salbu	Dimaukom Elementary School	113
MATANOG	Bayanga Norte	Bayanga Elementary School	298
MATANOG	Langkong	Langkong Elementary School	337
MATANOG	Sapad	Ibay Elementary School	365
MATANOG	Bugasan Norte	Marantao Primary School	63
MATANOG	Sapad	Lagaan Primary School	76
MATANOG	Bayanga Sur	Kuludan Primary School	203
RAJAH BUAYAN	Malibpolok	Malibpolok Elementary School	419
RAJAH BUAYAN	Tabungao	Pidsalenggian Elementary School	506
RAJAH BUAYAN	Panadtaban	Sambolawan Elementary School	378
RAJAH BUAYAN	Gaunan	Gaunan Elementary School	439
SOUTH UPI	Kuya	Lumao Elementary School	520
SOUTH UPI	Romangaob	Binaton Elementary School	332
SOUTH UPI	Pilar	Brawarbatew Elementary School	383
SOUTH UPI	Itaw	Itaw Elementary School	359
SOUTH UPI	Romangaob	Kuhan Elementary School	126
SOUTH UPI	Lamud	Lamud Elementary School	307
SOUTH UPI	Pilar	Mafran Elementary School	139
SOUTH UPI	Pilar	Pilar Elementary School	333
SOUTH UPI	Kuya	Benuan Elementary School	399
SOUTH UPI	San Jose	San Jose Elementary School	255
SOUTH UPI	Looy	Eliseo C. Sioson Sr. Elementary School	271
SOUTH UPI	Kuya	Trecero Elementary School	111
SOUTH UPI	Kuya	Kuya Elementary School	800
SOUTH UPI	Looy	Looy Elementary School	600
SOUTH UPI	Pandan	Aliman B. Gunsu Elementary School	750
SOUTH UPI	Romangaob (Pob.)	Timuay Tata Amuba Elementary School	17
SULTAN SA BARONGIS	Darampua	Darampua Elementary School	706

SULTAN SA BARONGIS	Kulambog	Kulambog Elementary School	355
SULTAN SA BARONGIS	Papakan	Datu Tecson Mamalo Elementary School	458
TALAYAN	Talayan	Midtimbang CElementary School	1,108
TALAYAN	Binangga North	North Binangga Elementary School	219
UPI	Darugao	Darugao Elementary School	241
UPI	Nangi	Kamonsawi Elementary School	224
UPI	Kibleg	Kindal Elementary School	166
UPI	Tinungkaan	Passi Elementary School	142
UPI	Darugao	Tenongol Elementary School	569
UPI	Renede	Blala Elementary School	192
		<u>Total Number</u>	<u>23,600</u>

ANNEX 6. FDC RESULTS OF ANALYSIS OF IRON RICE PREMIX AND RAW AND COOKED IRON FORTIFIED RICE USING NUTRIDENSE EXTRUDED IRON RICE PREMIX LABORATORY SCALE AND FROM ACTUAL PRODUCTION.

Summary of Results of FDC analysis and evaluation of iron rice premix and iron fortified rice.

Samples	Analysis and results	Remarks (Problems encountered and Solutions and other comments)
Iron Rice Pre-mix	<p>Chemical: Iron content = 427 to 439 mgFe/100g (see Table 1 below)</p> <p>Sensory – light creamy yellow color, no off-odor (see Table 2 below)</p> <p>Physical – no laboratory analysis conducted</p>	<p>Results showed that the raw IRP iron content were below the FDA standard and the claim of the supplier.</p> <p>Visually, the light color of IRP grains is almost the same as milled rice. This causes a little difficulty in separating IRP from milled rice during dispersion tests.</p> <p>During commercial production in Isulan, FDC QA personnel noted that size and shape of IRP are not uniform with thin pieces, lumps, and shavings (refer to Table 3 below). Also observed are powdery particles and lighter weight of IRP grains.</p> <p>Compared milled white rice grains.</p>
Raw Iron Fortified rice	<p>Chemical: Iron contents, Lab. Prepared IFR = 2.48 to 4.12 mgFe/100g (see Table 1 below) Mixing ratio = 1g IRP to 200g milled rice</p> <p>Sensory – no analysis conducted</p> <p>Physical – no analysis conducted</p>	<p>For laboratory prepared IFR – raw, the iron contents of 2 out of 3 samples are lower by more than half compared to FDA standard and slightly higher than the WFP Consultant's recommendation (i.e., draft standard for extruded iron-rice premix).</p> <p>Iron contents of commercially produced IFR (with extruded IRP) in Isulan were not analyzed as these are expected to be lower than the FDA standard which was based on iron coated IRP. Instead, cooked IFR was analyzed for iron contents. See results below.</p>
Iron fortified Rice Cooked	<p>Chemical: Iron contents, Lab. prepared IFR= 0.63 to 1.09 mgFe/100g (see results in Table 1 below); Mixing ratio= 1g IRP to 200g milled rice</p> <p>Commercially prepared in Isulan = 1.94, 1.50 and 1.66 mgFe/100g; mixing ratio= 1g IRP to 100g milled rice</p> <p>Sensory Lab. Scale: Creamy white color; no off-odor and off-flavor (see Table 2 below).</p> <p>Physical – no analysis conducted</p>	<p>For laboratory prepared IFR – cooked form had iron contents are lower than FDA standard but within the WFP Consultant's recommendation.</p> <p>For commercially produced IFR in Isulan, cooked form had iron contents which are within the FDA standard for cooked rice.</p> <p>Cooked IFR had creamy white color with no off-odor and off-flavor, characteristic of cooked milled rice.</p>

TABLE 1. SUMMARY OF RESULTS OF ANALYSES FOR IRON CONTENT OF EXTRUDED IRON RICE PREMIX (IRP) AND IRON FORTIFIED RICE (IFR) PREPARED FROM IRP (LABORATORY SCALE, MIXING RATIO= 1G IRP TO 200G MILLED RICE).

Sample	Iron Content (mg iron/100g)		
	Results of FDC Analysis	DOH-BFAD-BC No. 2007-010 requirements dated 10 October 2007	WFP Consultant recommendations* (based on proposed standard for extruded IRP)
1. Iron Rice Premix (Extruded Iron Rice Kernels) Sample #1	439	600 - 2,400	500 (Supplier's declaration) Minimum 300
Sample #2	427		
Average	433		
2. Iron Fortified Rice, Raw (Laboratory scale prepared by FDC, mixing ratio of 1g IRP to 200g milled rice) Sample #1	4.12	6 - 9	2 - 6
Sample #2	2.48		
Sample #3	2.64		
3. Iron Fortified Rice, cooked (Laboratory scale prepared IFR by FDC; mixing ratio 1 g IRP to 200g milled rice) Sample #1	1.09	1 - 2	0.6
Sample #2	0.63		
Sample #3	0.726		

* Information provided by WFP consultant, Dr. Corazon Barba as per telephone conversation with FDC Director Dr. Jocelyn M. Sales on September 4, 2019.

Remarks: Recommended to reduce the mixing ratio to 1g IRP to 100g milled rice for use during commercial production in Isulan.

TABLE 2. RESULTS OF SENSORY ANALYSIS OF EXTRUDED IRON RICE PREMIX (IRP) AND COOKED IRON FORTIFIED RICE (IFR) PREPARED FROM IRP AT THE LABORATORY SCALE (MIXING RATIO= 1G IRP TO 200G MILLED RICE).

Sensory Attributes	IRP (Iron Rice Pre-mix)	Cooked Iron Fortified Rice (IFR)
Sample #1		
Color	Light Creamy Yellow	Creamy White
Presence of Off-Odor	None	None
Presence of Off-Flavor	Not Applicable	None
Sample #2		
Color	Light Creamy Yellow	Creamy White
Presence of Off-Odor	None	None
Presence of Off-Flavor	Not Applicable	None
Sample #3		
Color	Light Creamy Yellow	Creamy White
Presence of Off-Odor	None	None
Presence of Off-Flavor	Not Applicable	None

TABLE 3. PERCENTAGE OF THIN, LUMPY AND SHAVINGS IN PACKAGED IRP FROM DIFFERENT PRODUCTION BATCHES

IRP Production Date	% Thin	% Lumpy	% Shavings
August 23, 2019	5.0	27.6	3.6
August 25, 2020	11.5	6.3	13.0
October 28, 2020	9.8	6.2	0.2

ANNEX 7. COMPUTATION OF THE COST FOR THE CONDUCT OF THE PILOT STUDY. THOSE IN BOLD ARE TECHNICAL ASSISTANCE COST NOT INCLUDED IN AN ACTUAL IMPLEMENTATION OF SBFP USING IFR.

Activity	Unit Cost (PhP)	Quantity	Total Cost (PhP)	Remarks
Iron Rice Premix (PhP 355/kg)	355,000/ton	28.52 MTs	10,124,600	For the production of 2,852 MTs of IFR at a mixing ratio of 1:100
Conduct of inspection and site visits	35,000	3 visits	105,000	Superintendence cost including sampling and analysis for 3 batches
Transport of IRP to Isulan	70,126/ton	28.52	1,999,994	IRP to WFP warehouse to NFA, Isulan
Rice bags for IFR	23.50	58,800 bags	1,381,800	For labelled IFR, can be costed to IFR producer.
Laboratory analysis (IRP, IFR raw and cooked)	6,925	3 batches	20,775	FDC lab analysis of iron content (3 trials each) and dispersion analysis
Inspection of NFA rice	40,000	3 visits	120,000	Inspection at NFA warehouses in Isulan, Zamboanga and Cagayan de Oro)
Inspection of small-holder farmers	40,000	15 visits	600,000	Visits to farmers' cooperatives for rice and supplementary foods
Inspection during IFR production	26,200	30 visits	786,000	Three trips for 3 batches. Production per day is 15 MTs IFR.
NFA blending services	700/MT	2,880	2,016,000	NFA blending cost at PhP 700/MT
Fumigation of IFR at WFP warehouse	68/MT	2000	136,000	Estimated fumigation cost
Warehouse cost for storage at NFA and WFP	100,000/month	7	700,000	Running cost for 7 months storage
Transport cost from NFA/WFP warehouse to schools	6,350,000	1	6,350,000	Transport from warehouse to schools PhP 6,000,000, from NFA to WFP PhP 350,000
Total Cost			24,340,169	Excluding estimated salary of WFP staff for 8 months at PhP 700,000 or a total of 5,600,000.
Estimated additional cost of IFR production	24,531,712	8,451/MT	8.451/kg	Estimated additional cost for the use of IFR for the pilot study
Estimated cost of IFR production excluding additional cost from the pilot study (in bold)	14,140,594	4,910/MT	4.91/kg	Estimated additional cost for the use of IFR excluding additional WFP expenses in the pilot study.

ANNEX 8. RESULTS OF MONITORING OF THE PILOT STUDY ON THE USE OF IRON-FORTIFIED RICE FOR THE SCHOOL FEEDING IN MAGUINDANAO.

Fighting Hunger Worldwide



**School Feeding Programme
2019-2020**



World Food Programme

Coverage

- 69 Schools
- 11 District

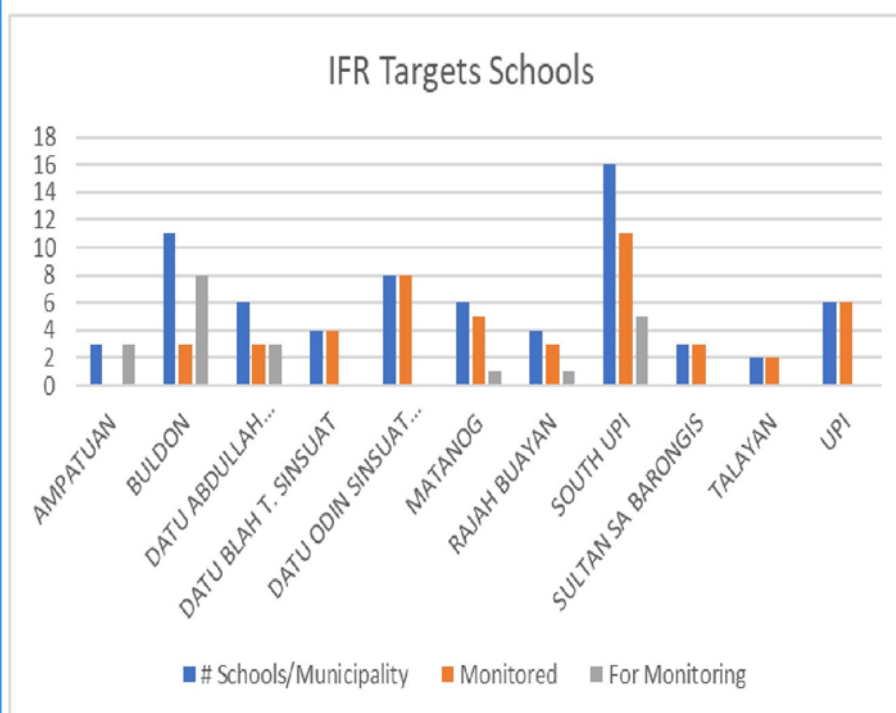
Monitored

70% - monitored
30% - for monitoring

Fighting Hunger Worldwide

Coverage per municipality

No	Municipality	# Schools/Municipality	Monitored	For Monitoring
1	AMPATUAN	3	0	3
2	BULDON	11	3	8
3	DATU ABDULLAH SANGKI	6	3	3
4	DATU BLAH T. SINSUAT	4	4	0
5	DATU ODIN SINSUAT (DINAIG)	8	8	0
6	MATANOG	6	5	1
7	RAJAH BUAYAN	4	3	1
8	SOUTH UPI	16	11	5
9	SULTAN SA BARONGIS	3	3	0
10	TALAYAN	2	2	0
11	UPI	6	6	0
Total		69	48	21
Percentage		100%	70%	30%



No	Municipality	Sarangay	School/BU/EC/ Name of Project	FDPr/SCHOOL/CL/ Clinic/EC	Monitored	For Monitoring	#/Municipality
1	AMPATUAN	HALATIMON	Halatimon ES	Halatimon ES		1	3
2	AMPATUAN	SABID	Sarangay ES	Sarangay ES		1	
3	AMPATUAN	MATAGABONG	Matagabong ES	Matagabong ES		1	
4	BUILDON	KARIN	Bagongbang ES	Bagongbang ES		1	11
5	BUILDON	DINGANEN	Central Educ ES	Central Educ ES	1	1	
6	BUILDON	KARIN	Karin ES	Karin ES		1	
7	BUILDON	KULIBRANG	Kulibrang ES	Kulibrang ES		1	
8	BUILDON	DINGANEN	Lower Dinganen PS	Lower Dinganen PS		1	
9	BUILDON	EDCOR (GALLEGO EDCOR)	Malulan ES	Malulan ES		1	
10	BUILDON	MATAYA	Mataya ES	Mataya ES	1	1	
11	BUILDON	CAJANAN (PCE)	Pinadangan PS	Pinadangan PS		1	
12	BUILDON	KARIN	Dimaglan ES	Dimaglan ES		1	
13	BUILDON	EDCOR (GALLEGO EDCOR)	Royal PS	Royal PS		1	
14	BUILDON	ORING	Data Abolal Manalao PS	Data Abolal Manalao PS		1	
15	DATU ABDULLAH SANGKI	SABANA	Data Sabita CES	Data Sabita CES		1	6
16	DATU ABDULLAH SANGKI	DINARPAO	Dinarpao ES	Dinarpao ES	1	1	
17	DATU ABDULLAH SANGKI	KAYA-KAYA	Kaya-Kaya ES	Kaya-Kaya ES	1	1	
18	DATU ABDULLAH SANGKI	MOO	Moo ES	Moo ES	1	1	
19	DATU ABDULLAH SANGKI	MAGANDY	Old Magandy ES	Old Magandy ES	1	1	
20	DATU ABDULLAH SANGKI	SUGADOL	Sugadol ES	Sugadol ES		1	
21	DATU BLAH T. SINGSIAT	MATUBER	Data Sa Bawang ES	Data Sa Bawang ES	1	1	4
22	DATU BLAH T. SINGSIAT	PENANGARAN	Dawat Central Elementary School	Dawat Central Elementary School		1	
23	DATU BLAH T. SINGSIAT	MAJUAN	Majuan ES	Majuan ES		1	
24	DATU BLAH T. SINGSIAT	PURA	Pura ES	Pura ES	1	1	
25	DATU OEN SINGSIAT (DNAAS)	BAGOENED	Bagoened ES	Bagoened ES	1	1	6
26	DATU OEN SINGSIAT (DNAAS)	BENOLEN	Benolen ES	Benolen ES	1	1	
27	DATU OEN SINGSIAT (DNAAS)	SIFAWEN (SIFAWAN)	Sifawen ES	Sifawen ES	1	1	
28	DATU OEN SINGSIAT (DNAAS)	SIBUTO	Sibuto ES	Sibuto ES	1	1	
29	DATU OEN SINGSIAT (DNAAS)	BAGOENED	Camp Ebrakin Sama ES	Camp Ebrakin Sama ES	1	1	
30	DATU SAUDI AMPATUAN	SUPARAWAN	Dumawan CES	Dumawan CES	1	1	
31	DATU SAUDI AMPATUAN	MALDA	Malda ES	Malda ES	1	1	
32	DATU SAUDI AMPATUAN	SAUBO	Dinawon ES	Dinawon ES	1	1	
33	MATANOG	BAYANGA NORTE	Bayangag ES	Bayangag ES	1	1	6
34	MATANOG	Langlong	Langlong ES	Langlong ES	1	1	
35	MATANOG	Langlong	Langlong ES	Langlong ES	1	1	
36	MATANOG	SARNO	Maratag PS	Maratag PS		1	
37	MATANOG	SARNO	Lapuan PS	Lapuan PS		1	
38	MATANOG	BAYANGA SUR	Kulaba PS	Kulaba PS	1	1	
39	RAJAH BUAYAN	MULBROGOK	Mulbrogok ES	Mulbrogok ES		1	4
40	RAJAH BUAYAN	YABUNGAD	Pidabroggan ES	Pidabroggan ES		1	
41	RAJAH BUAYAN	PARAGITARAN	Sambolwan ES	Sambolwan ES	1	1	
42	RAJAH BUAYAN	GAUNAN	Gaunan ES	Gaunan ES	1	1	
43	SOUTH UPI	KORA	Limao ES	Limao ES		1	16
44	SOUTH UPI	ROMANGCOB	Braonobee ES	Braonobee ES	1	1	
45	SOUTH UPI	FLAR	Flar ES	Flar ES	1	1	
46	SOUTH UPI	STAW	Staw ES	Staw ES	1	1	
47	SOUTH UPI	ROMANGCOB	Kuhan ES	Kuhan ES	1	1	
48	SOUTH UPI	LARNO	Larned ES	Larned ES	1	1	
49	SOUTH UPI	FLAR	Mafan ES	Mafan ES	1	1	
50	SOUTH UPI	FLAR	Flar ES	Flar ES	1	1	
51	SOUTH UPI	KORA	Bawan ES	Bawan ES	1	1	
52	SOUTH UPI	SAN JOSE	San Jose ES	San Jose ES	1	1	
53	SOUTH UPI	LOOP	Eliac C. Sison Sr. ES	Eliac C. Sison Sr. ES	1	1	
54	SOUTH UPI	KORA	Trevero ES	Trevero ES		1	
55	SOUTH UPI	KORA	Kora ES	Kora ES		1	
56	SOUTH UPI	LOOP	Loop ES	Loop ES		1	
57	SOUTH UPI	PANDAN	Aliman B. Gust ES	Aliman B. Gust ES	1	1	
58	SOUTH UPI	ROMANGCOB (PCE)	Timan Taka Amida ES	Timan Taka Amida ES		1	3
59	SULTAN SA BARONGES	DABAMPUA	Daramosa ES	Daramosa ES	1	1	
60	SULTAN SA BARONGES	KULAMBOD	Kulambod ES	Kulambod ES	1	1	
61	SULTAN SA BARONGES	PARANAN	Data Tapan Manalo ES	Data Tapan Manalo ES	1	1	
62	TALAYAN	TALAYAN	Milbimbang CES	Milbimbang CES	1	1	2
63	TALAYAN	STANAGUA NORTH	North Bawangag ES	North Bawangag ES	1	1	
64	UPI	DARUGAD	Darugag Elementary School	Darugag Elementary School		1	6
65	UPI	BARIG	Kamunagan ES	Kamunagan ES	1	1	
66	UPI	KIBIG	Kindal ES	Kindal ES	1	1	
67	UPI	TRINISKAGAN	Paal ES	Paal ES	1	1	
68	UPI	DARUGAD	Tenongol ES	Tenongol ES	1	1	
69	UPI	RENEDE	Blala ES	Blala ES	1	1	
Total					46	21	69
Percentage					70%	30%	100%

Good Practices

- Some LGU (SU and Matanog) provided fund to supplement feeding programme(purchase of vegetable and viands)
- Some schools allocated fund from monthly MOOE to purchase the viands and utensils
- Monitoring visits by Enumerators are unannounced to the schools. This resulted in the actual observation on how the school management and parents implement the feeding program.
- Assigned parents of students per class ensures students are well taken cared by their parents.
- School vegetable gardening projects help supplement the nutrition needs of students and learning environment for the students on the importance of healthy lifestyles.
- Participation of parents promotes good community relationship, unity and value of helping each other for a common goal.
- Parents used hygiene materials (head net, gloves and afron) SU

Testimonials

- From a teacher *"Good that WFP sent monitors to check the status of the project in order to improve the project"*
- From a parent *"Happy that their place is included in the feeding project by WFP"*
- Parents *"Masaaya kami kasi pumapasok na araw araw ang mga anak namin"*
- Bagoenged ES parent *"Malaking tulong para sa mga magulang at bata, less gastos narin at lagi nang nakakapasok sa school ang anak ko, kasi dito na siya kumakain, hindi na nag lalakad ng malayo"*
- Darugao Teacher *"Sana matulungan din ng World Food ang Kafangfang Elementary School, tulad namin para maging masaya at masigla ang mga mag-aaral"*
- Datu Tecson ES *"Salamat sa Programa na ito, kasi malaking tulong ito para mabawasan ang gastos namin sa pang araw araw, lalo na mahal ang bigas"*
- From a parent *"Minsan mahirap maghanap ng ulam kasi wala din masyado gulay sa garden kaya sana sa sunod po may kasama ng supply para sa ulam"*

Challenges

- Security concerns due to armed conflict in schools located in areas where armed groups operate result in suspension of classes and displacement.
- The lack of proper storage rooms proves a challenge for the schools, which causes safekeeping and pilferage concerns.
- No vegetable seeds to sustain school garden
- Majority of students belong to poor families and only have insufficient resources. In this case, not all parents are able to contribute vegetables or other viands to complement the rice meal. In order to meet the meal requirement, instant noodles and mung beans are cooked to augment the lunch meals.
- Lack of cooking and eating utensils. In some schools, parents per class are preparing the food of their children. However, classes without cooking utensils have to wait their turn to borrow the cooking pots of other classes (Pura ES in DBS) who have finished cooking.

Challenges

- Some schools in South upi using stone as stoves (Binaton ES, Brawarbatew ES, Binuan ES, Aliman Gunsu ES)
- The transportation via pumpboat in far-flung schools poses risk to rice cargo should the boat capsize.
- Security concerns due to armed conflict in schools located in areas where armed groups operate result in suspension of classes and displacement. (DASUA Schools)
- Some schools are not aware about the duration of the project, including calculation of daily consumption
- **Some teachers are not very cooperative when interviewed.**
- **Some parents are not openly responding to the questions, especially when teachers are observing the interviews.**
- .











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