GRANT-9132 INO: JFPR 9132-INO: Rice Fortification for the Poor - Strengthening Technical Capacity: Rice Fortification under RASKIN Program in Indonesia (41059-012)

INCEPTION REPORT

Prepared for

ASIAN DEVELOPMENT BANK

by

Agrifood Consulting International

In association with

PT AETS Indo Pacific (AETS)

December 2013

PREFACE

This document is the Inception Report[1] for the GRANT-9132 INO: JFPR 9132-INO: Rice Fortification for the Poor - Strengthening Technical Capacity: Rice Fortification under RASKIN Program in Indonesia (41059-012). The Inception report provides the background, objectives, and approach of the Consultant to the assignment. The report also details progress made during the Inception Phase and outlines a detailed plan of activities for the remaining part of the assignment.

Francesco Goletti

President, ACI

[1] To be referred as ACI and AETS 2003. Rice Fortification under RASKIN Program in Indonesia. Inception Report, prepared by Agrifood Consulting International (ACI) and PT AETS Indo Pacific (AETS), Kensington, Maryland, US, 13 December 2013.

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LIST OF ACRONYMS

BAPPENAS	Badan Perancang dan Pembangunan Nasional (Agency for National Planning and Development)
BBIA	Balai Besar Industri Agro (Agency for Agro Industry)
BPOM	Badan Pengawasan Obat dan Makanan (Agency for Food and Drug Control)
BULOG	Badan Urusan Logistik Nasional (National Logistics Agency)
EW	Extension Workers
FC	Flip Chart
FR	Fortified RASKIN
HACCP	Hazard Analysis Critical Control Point
Ibu-Ibu PKK	Ibu-Ibu Pemberdayaan Kesejahteraan Keluarga (Housewives organization for Empowering Family Wealth)
MN	Micro Nutrient
PDt	Point of Distribution for RASKIN
PDv	Point of Delivery for RASKIN
Pemda	Pemerintah Daerah (Regional Government)
QA	Quality Assurance
QC	Quality Control
RASKIN	Beras untuk Rumah Tangga Miskin (Rice for the Poor)
RMUs	Rice Milling Units
RTS PM	Rumah Tangga Sasaran Penerima Manfaat (Targetted Household as Beneficiary Recipients – THH BR)
SOP	Standard Operation Procedure
THH BR	Targeted Household as Beneficiary Recipients
Timkor RASKIN	Tim Koordinator RASKIN (Coordinating Team for RASKI)
UPGB	Unit Penggilingan Gabah dan Beras (Paddy and Rice Milling Units)
TOT	Training on Trainers

1. PROJECT BACKGROUND

1. The ADB Project of The Rice Fortification for the Poor (JFPR 9132-INO) in Indonesia has the goal to prevent and reduce iron-deficiency anemia, through the RASKIN program that will distribute 5000 metric tons of fortified RASKIN to about 60 000 targeted households as beneficiary recipients – THH BR (Rumah Tangga Sasaran Penerima Manfaat) residing in Karawang District.

2. Although other micronutrients will be blended into the fortified RASKIN, such as zinc, thiamin, vitamin B_{12}, folic acid and niacinamide, iron is considered key nutrient for this project. Iron is an essential mineral for the human being. The iron mineral functions as oxygen carrier in the red blood cells. The health and social consequences of anaemia and iron deficiency are well characterized and include impaired cognition, poorer educational achievement, increased morbidity and mortality in children, and reduced work capacity and poor pregnancy outcomes in women of reproductive age.

3. The project goal is to be achieved by blending the premix (fortified artificial rice kernels) that will be purchased and imported by the project with RASKIN (polished rice) in the three rice milling units (RMUs) in Karawang, as appointed by BULOG. The Government of Indonesia requested the ADB to strengthen BULOG technical capacity in fortifying of RASKIN through a technical assistance under this Project.

2. PROJECT OBJECTIVES

4. Project objectives as stated int the TOR are as follows:

i. Produce SOPs for rice fortification under RASKIN Program including handling and storage management for the premix and fortified RASKIN, producing fortified RASKIN, conducting QA and QC of the production and product
ii. Carry out a series of training/technical capacity development measure to produce quality fortified RASKIN in an efficient and effective manner, that includes training for BULOG and BPOM staff in handling and storage management of the premix and fortified RASKIN, and in producing the fortified RASKIN.
iii. Provide training in and supervision of the application of QA and QC for the mixing process, and the homogeneity test, monitoring the shelflife stability of the fortified RASKIN from the warehouse until the end users.
iv. Assist and supervise the identified rice mills during the mixing trials to meet the required homogeneity of fortified RASKIN, including guidelines for the scaling up.
v. Develop a community education and behavior change communication strategy, and prepare guidelines of complaint mechanism, and train extension workers in monitoring the actual consumption.
vi. Purchase the specified premix and digital volumetric feeders.
vii. Refurbish or provide appropriate equipment for the BULOG warehouse to store the premix.

3. PROJECT APPROACH

5. ACI in collaboration with AETS will draw on its experience in training and capacity building, and in food safety and quality assurance systems. ACI will provide training to raise awareness among the fortified rice stakeholders as well as the extension workers who will do the monitoring of distribution, and the actual consumption at THH BR.

6. **Purchasing of premix and equipment, and setting up equipment.** ACI will ensure the specifications for the premix and the three Digital Volumetric Feeders are met. Setting up equipment for rice blending or mixing trial, and fortification process, and for handling and storage of premix and fortified RASKIN will ensure the quality of the product. Prior to installation, the RMU machineries will be assessed to determine whether the Digital Volumetric Feeder can be directly attached or requires previous modification.

7. **Standard Operating Procedures (SOP) and training for rice fortification**. Our approach is to ensure BULOG has the capacity not only to implement the SOP, but also to train the RMU staff and to regularly update the QA system, QC procedures and SOP in line with emerging food safety threats, changes in distribution systems and technologies.

8. **Design, supervision and monitoring of QA, QC and mixing trials**. The fortification process needs to be fully supervised by BULOG and the Technical Consultant Team to ensure the homogeneity of fortified iron. The supervision will be linked with the QA and SOP monitoring system, which includes a HACCP system and also covers occupational health and safety (OH&S) requirements for process line equipment operation. The results from trials will be used to establish standards or benchmarks, and the procedures used in the most effective trial will be incorporated into SOPs and staff training. The amount of premix should be added by accommodating the sufficient level of iron content as the lead nutrient, and taken into consideration that the fortified RASKIN may be experienced 6-7 months of storage and distribution time, and exposed to washing, and cooking. The calculation will be done based on the existing data to be obtained from the premix supplier. The figure could be corrected later after close observation by the Project Technical Consultant Team on the points at the rice supply chain.

9. **Shelf life and supply chain**. The shelf life and stability of the iron content will be evaluated at the different process, starting with receipt of premix, to blending process, storage, distribution, and home cooking. The existing capacity of BPOM or other laboratories tasked with the quantitative analysis of iron content in fortified rice will have to be assessed. To extend the best fortified RASKIN quality for as long as possible under given conditions, storage of premix, and of the fortified RASKIN for the first6 months is recommended to be at low temperature of 15-20 ^{o}C with good stapling system and the space left between the rice staples, the storage walls and ground floor according to the project requirements. Supply chain management will be developed after close observation of existing practices throughout the

value chain supply points starting from the RMU storage of premix, to the RMU processing unit, RMU storage of fortified RASKIN, point of distribution (PDt), point of delivery (PDv), and targeted poor household (THH BR).

10. **Community Education and Communication Strategy.** Training will be carried out to raise the awareness of the advantages of fortified rice, and to understand the implementation of SOP for rice fortification, storage, and distribution for all stakeholders and household targets along the RASKIN supply chain. Standard labeling details including storage and cooking instructions, ingredients and nutritional information are required under CODEX Alimentarius. In the process and supply chain, a system for complaints handling, and corrective action requests (CAR) and responses to QA auditors, is an essential requirement for any standards-based certification of QA systems. Training extension workers to monitor the actual consumption of the fortified RASKIN will include three levels: provincial, district, and village levels. FGD (Focus Group Discussion) will be used as the delivery of raising awareness in the stakeholders of rice fortification: decision makers at both central and district, related institutions BULOG, BPOM, Ministry of Agriculture, RMUs from BULOG and private sectors, nutritionists, extension workers, poor household.

11. **Scaling up recommendations** will be developed if the results of the rice fortification project justify the nutrition impact upon the consumers. The consultant will summarize the feedback and complaint, if any, from the targeted poor households, the participating RMUs, and other stakeholders such as nutritionists, and decision makers.

4. MOBILIZATION OF THE TECHNICAL TEAM

12. The Technical Team started the project on November 13 with the Team Leader Prof Dr. Hadi K Purwadaria, called for internal meeting with Prof Dr Slamet Budijanto – Deputy Team Leader, and Prof Dr Ali Khomsan – Communication Specialist. Dr Fabian Rohner as the international expert joined the Team and has been in intensive communication by email and skype. The Technical Team met with ADB, and the Indonesian stakeholders in the kick-off meeting at Grand Citra Hotel, Karawang on 14 November 2013. Soon a second meeting was called at the same venue on 21 November 2013. One week afterward, there has been replacement of Prof Dr Ali Khomsan with Prof Dr Djoko Sutanto.

13. The Technical Team has visited the BULOG RMU to record the present facility and the SOP used in rice milling process. The Technical Team also consulted BAPPENAS, and Ministry of Agriculture for communication programs in this project. Preliminary mixing trial was carried out in BULOG RMU in Rengas Dengklok to ensure the possibility of the present machinery for the fortified rice production. Suppliers for DSM premix and digital volumetric feeders have been located and requested to send quotation.

5. DETAILED ACTIVITY PLAN

Table 1. Detailed activity plan for the project

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
1	**Project Preparation**			
1.1	Evaluation of existing milling equipment to assess type of feeder and possibly blending equipment.	1. Observation of existing milling equipment and required equipment for blending the RASKIN with premix. 2. Plan the possible modification of the blending equipment. 3. Pre-mixing trial to ensure the possibility of blending equipment.	1. Existing equipment required for blending is: vibrating shift, elevator, table container (**Attachment 1**). 2. Vibrating shift for rice grading was modified to transform its function into blending the rice and premix. 3. Preliminary mixing trial gave promising results (**Attachment 2**). 4. One UPGB (BULOG RMU) needs elevator and table container.	End November 2013
1.2	Inventory of storage infrastructure, existing SOP and QA system in RMU	1. Observation of space and building for storage. 2. Compiling existing SOP for milling and storage.	1. Space is ample inside tall and large rice storage. Thus, the premix storage has to be constructed separately inside the rice storage of BULOG RMU. 2. The premix storage was designed to be a semi-permanent one with dimension of 8.75 m x 7 m x 3 m (**Attachment 3**). These changes were proposed because the specification in the TOR for the premix was enough only to accommodate 9 tons, while the amount of the premix for each RMU is 16.5-17 tons. 3 Design of the rack for premix package and number of AC units were modified as described in Attachment 3. 4. Compiled existing SOP for rice milling and rice storage at the RMUs.	End November 2013
1.3	Assess capacities of laboratories in Indonesia for iron content analysis .	1.TOR stated that the iron content analysis should be done at the	1.The lab capacity assessment form is provided in **Attachment 4**. BBIA agrees to	End December 2013

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
		accredited lab of BBIA, Bogor. The lab capacity of BBIA and private lab for all mineral and micro nutrient content analytical procedures will be reviewed by Technical Team. 2. External lab analysis will be done by BPOM 14 days after the premix arrival.	analyze iron, Zn, folic acid and thiamin. Iron and Zn will be analyzed by AAS (Atomic Adsorption Spectrophotometer), while folic acid and thiamin by HPLC. Vitamin B_{12} and niacin will be analyzed by HPLC at a private accredited lab in Bogor. 2. Coordination with BPOM for the arrival time of premix.	
1.4	Meeting with all Indonesian stakeholders of the project, and ADB	1. Meeting with all relevant Indonesian stakeholders. 2.Meeting with individual Indonesian partner : Bappenas, Min. Health, Min. Agriculture, BULOG, Regional Government of Karawang District, BPOM 3. Coordination meeting with ADB	1. Confirmation of project goals and specifications. 2. List of poor household targets (**Attachment 5**) provided by Indonesian stakeholders.	3rd week of December, 2013
1.5	**Write Inception Report**	1. Each team member writes his own detailed plan. 2. Combine the detailed plan into an inception report.	**Submission of Inception Report**	**December 13, 2013**
2	**Purchasing Premix and Equipment**			
2.1.	Locate and select suppliers for premix, digital feeder, and other refurbish equipment	1. Prepare for specification of additional equipment to be purchased, see Attachment 3 2. Select and contact the suppliers for specified premix and digital feeder as specified by TOR, and specific additional equipment.	Name of suppliers, their products, and quotation. Suppliers and their products who sent the quotations are listed in **Attachment 6**.	December 13, 2013
2.2	Place order for premix, feeder and refurbish equipment (blending and storage)	1.Meeting with the suppliers 2. Evaluation of bids from suppliers 3. Determine the winning bidder based on the most promising product and reasonable product price	Orders of purchase are placed for selected suppliers	End of December 2013

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
		4. For feeders: do trial in one RMU for the selected one to confirm the capability of good homogeneity blending 5.Place orders		
2.3	Receipt of premix, and check quality	1. Prepare documents from Indonesian stakeholders to facilitate the arrival of premix and digital feeders if necessary. 2. Preparation of the sampling procedure for to check the premix quality 3. Sampling the premix 4. Sending samples for analysis of, to BBIA. 5.Run the analytical test for the premix : Iron, zinc, thiamin, folic acid, vitamin B_{12} and niacinamide at BBIA 6. Alert BPOM of the premix arrival	1.Premix is put in the storage of each the three RMUs, and ready for the rice fortification process 2.Assurance of the quality of the premix	1st week March 2014
2.4	Receipt of equipment	1.Arrival of digital volumetric feeders 2.Check the specification of feeders	Digital volumetric feeders are ready for installment	1st week March 2014
3	**Setting up Equipment and Storage**			
3.1.	Refurbish storage space to comply with quality requirements	1.Supervise construction of storage, and racks, and installment of air condition at the 3 RMUs as specified in the purchase order 2. Check the temperature and RH of all storages in compliance of the requirement	Storage spaces with air condition and racks at all three RMUs are ready to accept premix	Mid February 2014
3.2	Install feeders on-line with the blending equipment	1.Installing and commissioning of the digital volumetric feeders : electrical and machinery installation, and lay out	1. Blending process line is ready at all the 3 RMUs 2. Trained operators : 2 persons at each RMU	2nd Week March 2014

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
		2. Training 6 RMU operators to handle the feeder and blending operations		
4	**Blending Trial**			
4.1	Run pre-test trials to check for homogeneity, and training of the operators	1. Run pre-test trials for blending premix and RASKIN, sampling the fortified RASKIN at every one hour and check the homogeneity. 2.Homogeneity protocol is described in **Attachment 7** 3.Training 15 operators and BULOG Staff for blending premix and RASKIN to achieve the homogeneity by DSM Company for 5 hours running process SOP for inspection sampling at the factory	1. Homogeneity in physical mixture with the premix content ranges close to 1 part premix : 100 parts RASKIN and subsequently, with the iron content range close to 80 ppm. 2. Trained operators and BULOG staff (15 persons) who are ready to manufacture the fortified RASKIN.	2nd week of March 2014
4.2	Develop SOP for fortification process accommodating QC and QA	Write SOP and instruments for QA and QC for premix handling, and fortification process.	SOPs and instruments for QA and QC (**Attachment 8**)	3rd week of March 2014
4.3	Finalize trials for homogeneity tests	1. End of mixing trials. 2. Processed data resulted from the trials. 3. Write report	1. Assurance of production process for blending premix and RASKIN at the homogeneity level close to 1: 100. 2. Assurance of fortified RASKIN with iron content close to 80 ppm.	3rd week of March 2014
4.4	Adapt and finalize SOP for training curricula, conduct training	1. Put the SOPs in training modules 2.Conduct training for 15 operators and BULOG staff in the standard fortification process 3. Conduct training for 5 BPOM staff in QC of the FR	1.Training modules for blending fortified RASKIN 2. Fifteen trained operators and BULOG staff for blending FR 3. Five trained BPOM staff for QC of FR	4th week of March 2014
5	**Submission of Midterm Report**	**Write Midterm Report**	**Submission of Midterm Report**	**End of March 2014**

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
6	**Fortified RASKIN Production, and Distribution**			
6.1	Start and continue fortified RASKIN production until 5000 tons accomplished	1. Develop monthly production schedule with BULOG RMUs 2. Start production of FR (Fortified RASKIN) at the 3 RMUs 3. Continue production of FR until 5000 tons areaccomplished	FR is ready for distribution to household target at the required amount every month	First April – End November 2014
6.2	Monitor the process, and quality by taking and analyzing the samples	1. Monitoring the production process of FR 2.Sampling and analysis of the homogeneity of FR every month from all 3 RMUs	1.Assurance of the homogeneity of produced FR 2.Assurance of the stability of FR	First April – End November 2014
6.3	Distribution, and monitoring of the distribution of the fortified RASKIN	1.Distribution of FR to household targets 2.Monitoring of the distribution along the supply chain through extension workers (EW)	FR has reached the household targets	First April – End November 2014
7	**Community Education and Communication Strategy**			
7.1.	Develop materials for awareness of fortified RASKIN	Development of Learning Modules for the Extension Workers (EWs): 1. Definition and Objective of Fortification and FR 2. The meaning of Micro Nutrients (MNs) 3. Nutritional deficiency of lacking of MNs 4. Issues on Nutrition Problems and Fortification 5. Storage and Cooking of FR	1.Learning Modules put in Booklet: 2.Fifty printed Booklet for the EWs 3.Four modules in short statements will be the major content of the booklet : Adult Education Community Approach Community Education FR Purposes and Benefit	End December 2013
		Development of Flyer and Calendar for the EWs and the targeted poor household (THH) about FR Subject matters on:	1.Printed Flyer for the households and EWs: 6050 pieces 2.Printed Calendar for the EWs: 50 pieces	2nd week January 2014

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
		1. Definition and Objective of Fortified Foods 2. Advantages of Fortified foods and FR 3. Nutritional Problems of lacking of MNs 4. Calendar: Dates of FR distribution and monitoring		
		Development of Pocket Book for the EWs. 1. Content of the Poster: The Objective of FR 2. Contents of Pocket Book: Important days for the EWs, namely: Dates of TOT, monitoring, evalua-tion and issue on complaints	1.Printed Pocket Book for EW: 50 pieces	2nd week January 2014
		Development of Flip Chart (FC) for the EWs 1. Definition andObjectiveof FR 2. Issues of Nutrition and fortification 3. Consequences of MN deficiency 4. Advantages of consumption of FR 5. Storage and cooking of FR	Printed of FC for EW : 50 pieces	End January 2014
7.2	Develop SOP and guidelines for monitoring actual consumption, and complaint mechanism	1.Development of guidance for monitoring consumption of FR among the THH 2.Development of instrument for Dietary Recall on FR consumption for the EWs 3. Development of guidelines in taking sampling of FR from	1.Developed SOP and guidelines 2.Developed networking for complaint mechanism 3.Developed media for complaint mechanism	2nd week February 2014

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
		distribution points, delivery points, and THH 4. Development of networking, and media for complaint mechanism including EW, village head, district head, TimKor RASKIN, BULOG, Ministry of Agriculture, BAPPENAS, and Project Team 5.Development of guidance for networking of complaints mechanism and handling responds of FR for the EWs		
7.3	Capacity building and training for extension workers, and program socialization for targeted poor households – THH	1.Capacity building in community approach methods for adults. 2.TOT for the 50 EWs in the developed learning modules. Two times training each two days. The TOT will be carried out at the Agricultural District Office in Karawang 3.Training THH by EW in community and social gatherings such as Ibu-Ibu PKK and majelis taqlim	1.Fifty trained EW with increased capacity building 2.Awareness among THH about the purposes of FR program, and the benefit of consuming FR	3nd week February 2014
7.4	FGD (Focus Group Discussion) with decision makers, BAPPENAS, BULOG, RMUs, Ministry of Agriculture, TimKor RASKIN, BPOM, nutritionists, extension workers, poor households, all other stakeholders	FGD will invite about 30 persons and will be carried out in Karawang	1. Awareness of FR program and benefit for community. 2.Problems identified as well as potential solutions devised	1st week April 2014
7.5	Monitoring actual consumption and handling of complaint mechanism	1.Coordinate EW in monitoring actual consumption in THH, taking FR samples, and receiving complaints and delivery of complaints into the appropriate networking channels	1.Data for actual consumption in THH 2.Recommendations on complaint mechanism networking and handling	April-November 2014

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
		2.Collection of data on actual consumption 3.Evaluation of the course of complaint mechanism		
8	**Supply Chain Management**			
8.1	Observe supply chain at all points starting at BULOG RMU storage to targeted poor household (THH-BR)	Survey of supply chain actors starting from BULOG RMU storage until the THH-BR	Data of characteristics of FR supply chain	Mid June 2014
8.2	Develop supply chain management at all points	Write management of FR handling at all points of supply chain	Developed supply chain management of handling FR	End June 2014
9	**Monitoring Shelf Life and Stability of Fortified RASKIN**			
9.1	Setup regular and accelerated stability tests	1. Run stability test for premix, and fortified RASKIN at room 30 C (regular), and high temperatures of 40 C, and 50 C (accelerated), and 70 % RH in the laboratory. The protocol is laid out in the **Attachment 9** 2. Samples will be taken every four days for one month or until the nutrient degradation reaches 50% (lower than 50 % content remaining). 3. Samples will be analyzed for folic acid content at the addition of iron that will be pretty stable.	Results of stability test with folic acid degradation as the marker.	End May 2014
9.2	Sampling from all supply chain points and conduct laboratory analysis	1. Sampling of FR at all supply chain points: 3 BULOG RMUs, 5 Distribution Points, 5 Delivery Points, and 25 Household targets for every two months in 8 months. 2. Run the homogeneity test	Assurance of homogeneity of iron content at supply chain points	First April – End November 2014
10	**Finalization of all SOP and Guidelines**		Final SOPs and Guidelines after receive feedback from operations in the field	End November 2014
11	**Scale-up Recommendations and Other Micronutrient Analytical**	1.Write recommendations for scaling up FR in Indonesia	1.Recommended scale up FR operation 2.Complete micronutrient analytical	End November 2014

No	Activity	Detailed Activity	Outcomes and Expected Outcomes	Expected Completion
	Procedures	2.Write all micronutrient analytical procedures of premix	procedures	
12	**Workshop on Project Output**	Conduct workshop for all Indonesian and ADB stakeholders In Jakarta	1.Awareness of FR and the outcomes of the project 2.Possibility to scaling up the program into a nationwide level	1st week December 2014
13	**Final Report and Dissemination**	Write final report	Disseminated Final report	December 2014

6. PROGRESS OF THE PROJECT

14. The progress so far could be described as follows:

i. Evaluation of existing milling equipment to assess type of feeder and possibly blending equipment (Activity 1.1). Outcomes in Table 1, the illustration of the existing equipment was described in **Attachment 1**.
ii. Pre-mixing trial in one BULOG RMU for simulated colored premix with rice which resulted in promising results (**Attachment 2**).
iii. Inventory of storage infrastructure, existing SOP and QA system in RMU (Activity 1.2). Outcomes in Table 1, required refurbish storage and its design was reported in the **Attachment 3**.
iv. Developed form for laboratory capacity assessment in **Attachment 4** which is related to activity 1.3.
v. Meeting with all Indonesian stakeholders of the project, and ADB (activity 1.4): 2 times in a whole group meetings, and more with individual stakeholders: BAPPENAS, Ministry of Agriculture, and BULOG. List of household targets was obtained from BAPPENAS (**Attachment 5**).
vi. Locate and obtain suppliers for DSM premix and digital volumetric feeders (activity 2.1). List of suppliers sending quotation was presented in **Attachment 6**.
vii. Developed protocol to analyze the homogeneity of premix in rice (related to activity 2.4) outlined in **Attachment 7**.
viii. Identified SOPs and instruments for QA and QC to be developed in relation of Activity 4.2 (Table 1) which was listed in **Attachment 8.**
ix. Developed protocol to run accelerated stability test of premix and fortified rice (Activity 9.1) which was described in details in **Attachment 9**.

7. PROCUREMENT OF PREMIX, DIGITAL FEEDER, AND REQUIRED REFURBISH STORAGE

15. Procurement of digital feeder is critical since the least delivery time quoted by suppliers was 10 weeks. If the order is placed in December 2013, the fastest expected arrival is the first week of March 2014. Thus, the pre-mixing trial will start only in the second week of March, and distribution will be in April to November 2014.

16. Procurement of DSM premix needs 36 days manufacturing in plant after purchase order. The factory did not give estimate of shipment time but warn that the arrival date should consider the shipment from factory to Shanghai, Shanghai to Jakarta via Singapore, and seaport to BULOG RMU. It also warned about the holiday time of Chinese New Year in the fourth week of January 2014.

17. There are 2 critical risks in procurement :

i. Shipment delivery time that is uncertain and affected by holiday time.

ii. Taking out of the goods from seaport needs letter to waive the tax from Indonesian tax holders. Even so, there is no guarantee that the Tax Office in the sea port will agree to waive 100 % tax of premix and the digital feeder.

18. All order required down payment prior to the manufacturing of the goods. Placed order means down payment has been already transferred.

19. Required refurbish storage has the least risk since it would be carried out domestically. However, the construction must start soon in early January after Christmas and New Year holiday time.

8. RISK MANAGEMENT

20. Risk management is necessary to be outlined for happenings out of the Technical Team control. It needs support from ADB and the Indonesian stakeholder agencies. The risks are outlined in Table 2 and the expected support is indicated.

Table 2. Possibility of risk and risk management

No	Deviation from Plan	Risk Level and Description	Requirement to overcome the risk	Expected Support from
1	Place of order for premix and digital feeder	High. Will delay the whole project.	Ready funding for down payment	ADB for timely release of down payment
2	Delay of manufacturing and shipment of goods	Very high. Will delay production and distribution	Only tight monitoring to supplier, and tracking ship can be done	AETS and ACI
3	Release of goods from sea port Jakarta because of handling and tax	Very high will extend spending, and delay production and distribution	i.If supplier agrees, contract should include door to door shipment. ii. Request Letter for waive the import tax from BAPPENAS as early as possible	i.BAPPENAS to produce the letter in due time ii.ADB to use contingency fund if the Tax Department refuse the request
4	Installment of feeder needs modification of existing milling equipment	High. Will delay production and distribution.	Intensive communication of technical needs of feeder between supplier and BULOG facilitated by Technical Team.	BULOG full support and flexibility in accommodating the digital feeder
5	Time for chemical analysis is 10-15 working days (2-3 weeks). Analysis of premix and fortified rice homogeneity in the initial phase of the project need immediate results.	Medium. It will delay the start of the production.	Pay double for the standard price of analysis only for the initial phase of the project.	ADB approval because the increase of price may cause the use of contingency fund.

No	Deviation from Plan	Risk Level and Description	Requirement to overcome the risk	Expected Support from
6	Since the project is semi-open to the household target, meaning the household targets are informed about the fortified rice, there is possibility that the community refuses to further accept the fortified rice.	Very high. It will delay the distribution, or cause problem to move the target area.	Ensure the capability and dedication of extension workers in socializing the program to the household targets	i. Ministry of Agriculture to sufficiently and timely provides funding for the extension workers' operation ii. Decision of all Indonesian stakeholders to move to another district when social unrest happens
7	Failure of household targets to pay some monthly distributed fortified rice	High. It will disrupt the data collection and analysis	Coordination with TimKor RASKIN will only result in effort to persuade the household target to find money for pay-ment	Decision of Indonesian stakeholders to allow missing data for some months, or delay the project until the full 8 months feeding is finished to be carried out

ATTACHMENT 1. EXISTING EQUIPMENT FOR BLENDING RASKIN WITH PREMIX IN BULOG RMUS

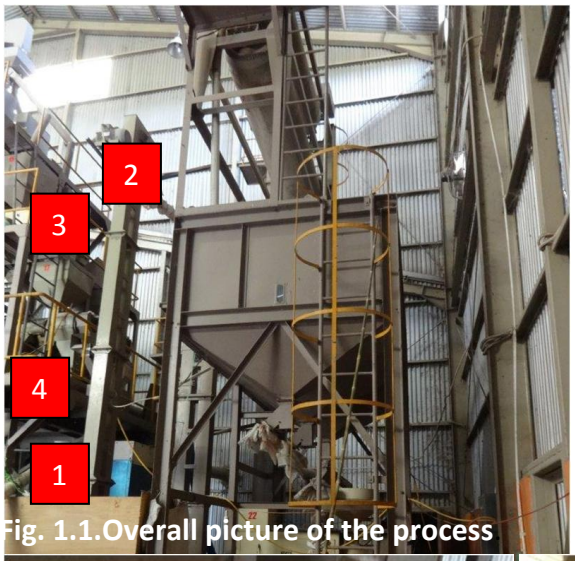


Fig. 1.1.Overall picture of the process

RASKIN rice will be downloaded in the table container (1) on the first floor.
The rice will be lifted by the elevator (2) and dropped on the point of feeding (3) at the second floor.
The digital volumetric feeder will be positioned on the top of this point of feeding (3).
RASKIN rice and premix will flow down together into the vibrating shift (4) to be mixed.


Fig. 1.2. Details of feeding point (3).


Fig. 1.3.The vibrating shifter.

2 RMUs have this complete setup of machinery, 1 RMU only has vibrator shifter and elevator that needs repair. The project has to include the table container in the refurbish equipment, and the repair of the

ATTACHMENT 2. RESULTS OF PRE MIXING TRIAL

Fig. 2.1.Results of manual blending using colored simulated premix.

Table 2.1.Colored simulated premix content in the mixed rice

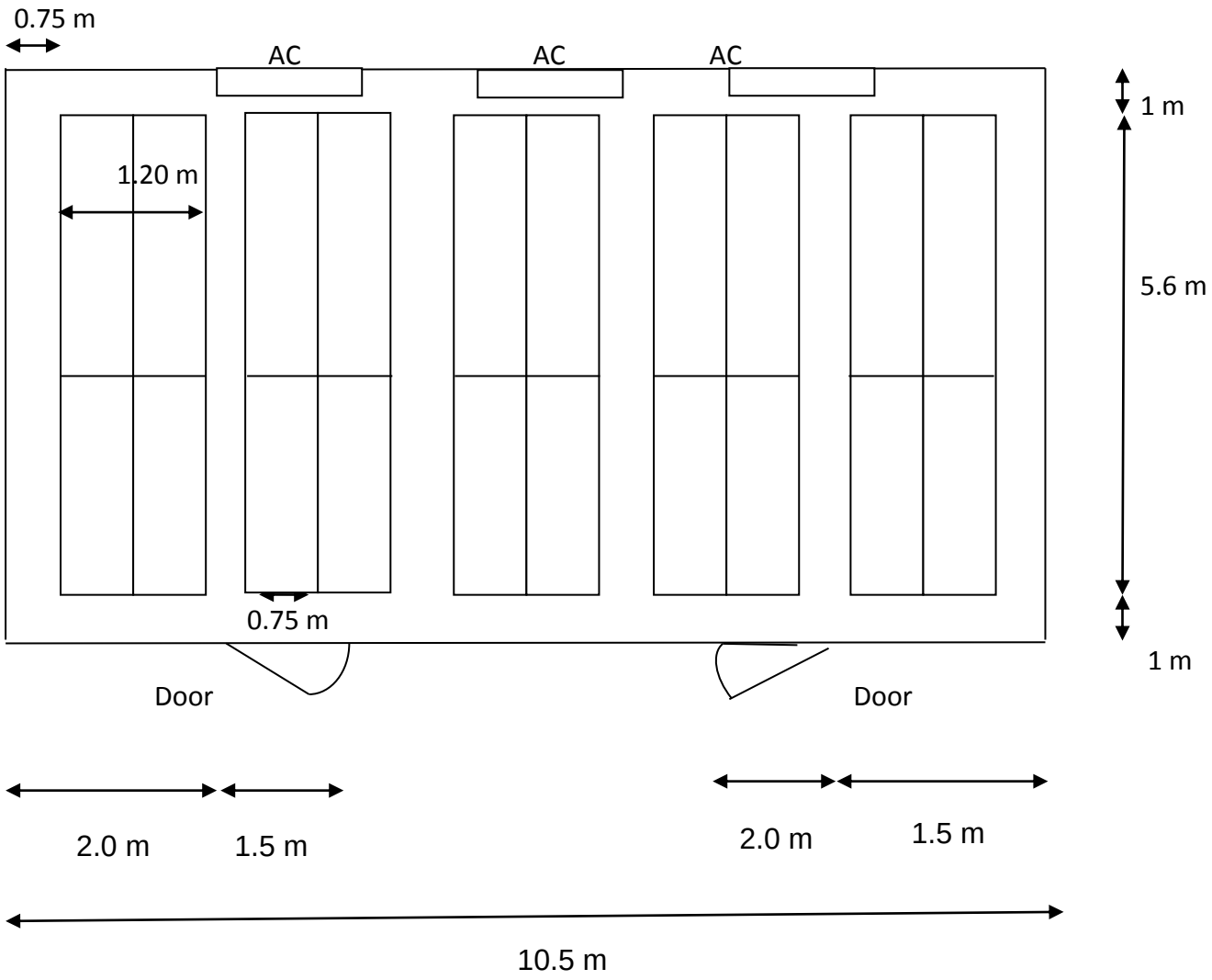
No Sample	Mixed Rice Weight	Premix Weight	g premix/100 g mixed rice
1	115.0	1.3	1.1
2	100.0	1.0	1.0
3	101.0	1.0	1.0
4	100,0	1.0	1.0
5	88.4	0.9	1.0
6	158.0	1.3	0.8
7	116.9	1.3	1.1

ATTACHMENT 3. REQUIREMENT FOR REFURBISH STORAGE

1. **Semi permanent storage**

Dimension : 10.5 m x 7.6 m x 3 m

Suggested construction material : metal frame with multiplex board walls.



Rack

5 pairs of rack in rows each consist of 4 racks with dimension of 2.8 m x 1.75 m x 0.6 m to accommodate 16.5 – 17 tons of premix in 25 kg bags (dimension 0.6 m x 0.4 m x 0.25 m)

Figure 2.2. Dimension of wooden rack.

2. Air Conditioner

For 10.5 m x 7.6 m x 3 m storage: 3 AC units are required of 2 HP each.

3. Table Container and Elevator

One unit table container as illustrated in Fig. 2.3 to facilitate down load of RASKIN at the beginning of blending process. Material: metal frame, metal sheet, multiplex board.

One unit elevator needs repair for the motor and cups.

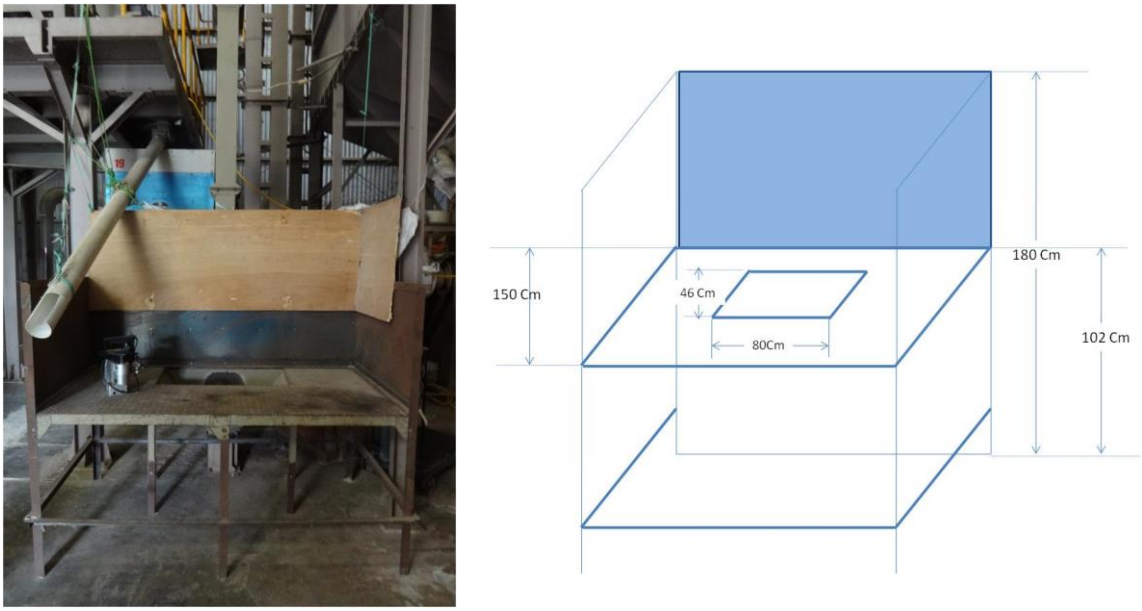


Figure 2.3. Table container for down loading RASKIN in blending process and its dimensions.

4. Stair case and Standard for Digital Volumetric Feeder

Stair case to pour premix into the hopper of digital feeder : metal frame and wooden board.
Standard for positioning the digital feeder : metal frame, metal column, and metal sheet.

ATTACHMENT 4. FORM FOR ANALYTICAL LABORATORY CAPACITY ASSESSMENT

Lab name: _____

Institution: _____

Date of visit: _____
Enumerator: _____

Type of lab: ☐ Government ☐ Academia ☐ Clinical ☐ Industry ☐ Other
Personnel: Name lab director: _____

Phone: _____
E-mail:_____

Name other key staff: _____

Phone: _____
E-mail:_____

General information
Number of Staff: _____

Education and training of key staff: _____

_____

As attachments, please provide the following documentation, if available:

Attachment description	**Yes, attached**	**No, not attached**
Organizational chart of the laboratory personnel		
Table of Contents of your documented QA/QC system		
Copy of any accreditation or certification you may have		
Copy of any membership in relevant association, e.g. AOAC, ISO, AACC		

Lab activities related to relevant analyses for the fortified RASKIN project

1. Which of the following food types does your lab analyze in chemical and physical characteristics?

	Food type	**Yes**	**No**
1.1	Cereal (grains)		
1.2	Cereal products (flours, blends,…)		
1.3	Rice		
1.4	Rice flour		
1.5	Extruded products : premix etc.		

2. Regardless of the food type, what chemical analyses does your lab conduct on food? Also indicate the estimated number of food analyses for each category per annum

	Chemical analysis	**Yes**	**No**	**Number of analyses/p.a.**
2.1	Iron, any/all forms			
2.2	Ferric pyrophosphate specifically			
2.3	Zinc, any/all forms			
2.4	Zinc sulphate monohydrate specifically			
2.5	Thiamin, any/all forms			
2.6	Folic Acid, any/all forms			
2.7	Vitamin B_{12}			
2.8	Niacinamide			

3. From the table above, which are the food items most often analyzed, and would you state that your laboratory has experience in analyzing grain cereals and or rice for each analyte?

	Chemical analysis	**Food item most often analyzed?**	**Experience with grain cereals?**
3.1	Iron, any/all forms		
3.2	Ferric pyrophosphate specifically		
3.3	Zinc, any/all forms		
3.4	Zinc sulphate monohydrate specifically		
3.5	Thiamin, any/all forms		
3.6	Folic acid, any/all forms		
3.7	Vitamin B_{12}		
3.8	Niacinamide		

Comments for questions 1-3:

_____

_____

4. Analytical method used for grain cereals (or, if no experience on grain cereals, on pasta or cereal flours)? Please fill in for which food type you use the method and then, which protocol

you use (e.g. AACC, AOAC,…; if in-house method developed, please attach protocol to this questionnaire). Always think of the food type most closely resembling rice kernels (rice flour for certain)

	Type ofanalysis	**Food type for which protocol is used**	**Protocol description (e.g. AACC 40-70 iron AAS)**
4.1	Iron, any/all forms		
4.2	Ferric pyrophosphate specifically		
4.3	Zinc, any/all forms		
4.4	Zinc sulphate mono hydrate specifically		
4.5	Thiamin, any/all forms		
4.6	Folic Acid, any/all forms		
4.7	Vitamin B_{12}		
4.8	Niacinamide		

Comments for question 4:

_____

_____

_____

_____

QC/QA systems and certifications in place for relevant analyses

5. Internal quality control: If for any of the test below, you are using standard reference material (e.g. from NIST or other standard reference material supplier), please provide the name of the supplier and the exact product name or identification number). If for a given analyte, you use several standard materials, please indicate the one most closely resembling rice kernels (or rice flour), e.g. other grain cereals or flours. Also, specify, how often you run these standard materials (e.g. daily, every 20th sample analyzed,…)

	Type ofanalysis	**Supplier/name of standard**	**Frequency the standard is run in your lab**
5.1	Iron, any/all forms		
5.2	Ferric pyrophosphate specifically		
5.3	Zinc, any/all forms		
5.4	Zinc sulphate monohydrate specifically		
5.5	Thiamin, any/all forms		
5.6	Folic Acid, any/all forms		
5.7	Vitamin B_{12}		
5.8	Niacinamide		

Comments for question 5:

_____

_____

_____

_____

6. External validation: If for any of the tests below, you are participating in some kind of external validation (ring testing, round robin, etc.), please attach the reports of the two most recent result reports, where the performance of your laboratory can be easily estimated.

	Type ofanalysis	**Description of external validation**	**Name of the attachment**
6.1	Iron, any/all forms		
6.2	Ferric pyrophosphate specifically		
6.3	Zinc, any/all forms		
6.4	Zinc sulphate monohydrate specifically		
6.5	Thiamin, any/all forms		
6.6	Folic Acid, any/all forms		
6.7	Vitamin B_{12}		
6.8	Niacinamide		

Comments for question 6:

_____

_____

_____

_____

7. National or national inspections: If your lab is inspected/audited from time to time, please provide in the table below the scope of the inspection/audit and the frequency and outcomes (if needed, provide reports to substantiate your answers). Again, keep in mind that the main objective of this questionnaire is to find out information on analyses/types of food relevant for the fortified RASKIN project.

	Inspection body	**Scope of inspection/ audit**	**Frequency**	**Outcome of the most recent inspection/lab audit**
7.1				
7.2				
7.3				
7.4				

Comments for question 7:

_____

_____
_____
_____

8. Data and QC/QA book keeping and documentation: please provide below a description of how analytical results are recorded and kept (format, how long after release), how QC results are recorded and kept, and what the SOP's in place are to take action in case of non-conforming QC tests. Although this question is kept in general wording, please bear in mind the above discussed methods and food types most relevant to the fortified RASKIN project. Substantiate your response by any relevant documentation in the attachment.

   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

9. Major lab equipment: in the table below, please fill in the table according to the equipment you have, the make/model, purchasing year and maintenance frequency (by an external maintenance company or the supplier of the equipment). If you have several equipment of the same type, you may use empty rows at the bottom of the table to complement the list.

	Equipment	**Make/model**	**Year of purchase**	**Maintenance schedule**
9.1	HPLC			
9.2	HPLC detector 1			
9.3	HPLC detector 2			
9.4	AAS			
9.5	GC			
9.6	UV/VIS spectrophotometer			
9.7	Plate reader			
9.8	Fridge, +4°C			
9.9	Freezer, -25°C			
9.10	Freezer, -80°C			
9.11	Muffle furnace			
9.12	Sterilisingoven			
9.13	Large centrifuge			
9.14	Small centrifuge			

9.15	Temp. controlled incubator			
9.16	Temp./humidity controlled incubator			
9.17	Automated RH. measuring device			
9.18	Lab scale, mg precision			

ATTACHMENT 5. LIST OF SELECTED HOUSEHOLD TARGETS

Following is the list of the household target in the 50 villages in Karawang district selected by BAPPENAS and Pemda Karawang who have good track record in paying the RASKIN in scheduled time, and high percentages of poor household families per village. BAPPENAS and Pemda Karawang promised in the second meeting to reevaluate the list by their last performances in 2013.

NUMBER OF VILLAGES, HOUSEHOLD, AND POOR HOUSEHOLD IN KARAWANG DISTRICT

No	Subdistricts	Villages	Populat-ion	Ave Persons per Family	Household (Hh)					
				#/family	Jan-May	THH (PPLS 2012)	Hh (SP 2010)	% THH	Raskin Quota Tons/10 m Pagu Raskin (ton) 8 bulan	
									Tons/ 10 m	Tons/ 8 m
1	BANYUSARI	TANJUNG	2.758	3,5	604	682	788	87%	102,30	81,84
2	KUTAWALUYA	SINDANGMULYA	3.445	3,4	963	863	998	86%	129,45	103,56
3	CILEBAR	PUSAKAJAYA SELATAN	2.909	3,7	645	633	778	81%	94,95	75,96
4	BANYUSARI	GEMBONGAN	3.138	3,6	692	625	861	73%	93,75	75
5	TEMPURAN	JAYANAGARA	2.505	3,3	409	535	749	71%	80,25	64,2
6	TALAGASARI	PULOSARI	2.460	3,2	523	540	756	71%	81,00	64,8

No	Subdistricts	Villages	Populat-ion	Ave Persons per Family	Household (Hh)					
				#/family	Jan-May	THH (PPLS 2012)	Hh (SP 2010)	% THH	Raskin Quota Tons/10 m Pagu Raskin (ton) 8 bulan	
									Tons/ 10 m	Tons/ 8 m
7	PEDES	KEDALJAYA	4.500	3,9	683	794	1161	68%	119,10	95,28
8	CIBUAYA	GEBANGJAYA	2.014	3,7	468	364	542	67%	54,60	43,68
9	BANYUSARI	TALUNJAYA	2.158	3,4	377	419	626	67%	62,85	50,28
10	CIBUAYA	KALIDUNGJAYA	2.973	3,9	472	515	770	67%	77,25	61,8
11	JAYAKERTA	JAYAKERTA	5.262	3,9	840	884	1346	66%	132,60	106,08
12	BATUJAYA	BATURADEN	4.768	3,9	924	802	1230	65%	120,30	96,24
13	KUTAWALUYA	WALUYA	3.274	3,6	572	590	910	65%	88,50	70,8
14	KARAWANG BARAT	MEKARJATI	12.092	3,8	1.681	1.986	3177	63%	297,90	238,32
15	KUTAWALUYA	SINDANGKARYA	3.032	3,2	601	582	940	62%	87,30	69,84
16	CIBUAYA	KEDUNGJERUK	5.578	4,2	809	822	1331	62%	123,30	98,64
17	TEMPURAN	LEMAHKARYA	3.343	3,4	513	600	987	61%	90,00	72

No	Subdistricts	Villages	Populat-ion	Ave Persons per Family	Household (Hh)					
				#/family	Jan-May	THH (PPLS 2012)	Hh (SP 2010)	% THH	Raskin Quota Tons/10 m Pagu Raskin (ton) 8 bulan	
									Tons/ 10 m	Tons/ 8 m
18	CILAMAYA WETAN	MUARA	4.105	3,2	870	776	1282	61%	116,40	93,12
19	CIBUAYA	SUKASARI	3.594	3,8	697	578	959	60%	86,70	69,36
20	CILEBAR	MEKARPOHACI	4.378	3,5	615	742	1236	60%	111,30	89,04
21	CILAMAYA KULON	TEGALURUNG	4.611	3,8	848	735	1225	60%	110,25	88,2
22	TEMPURAN	CIPARAGEJAYA	4.818	4	653	723	1209	60%	108,45	86,76
23	LEMAHABANG	LEMAHMUKTI	4.183	3,6	719	680	1147	59%	102,00	81,6
24	PAKISJAYA	TANJUNGPAKIS	5.178	3,9	682	790	1339	59%	118,50	94,8
25	PEDES	LABANJAYA	5.099	3,7	719	801	1359	59%	120,15	96,12
26	JATISARI	TELARSARI	3.884	4	543	569	978	58%	85,35	68,28
27	TEMPURAN	PURWAJAYA	3.490	3,5	697	584	1006	58%	87,60	70,08
28	CIBUAYA	JAYAMULYA	4.095	3,6	841	654	1132	58%	98,10	78,48

No	Subdistricts	Villages	Populat-ion	Ave Persons per Family	Household (Hh)					
				#/family	Jan-May	THH (PPLS 2012)	Hh (SP 2010)	% THH	Raskin Quota Tons/10 m Pagu Raskin (ton) 8 bulan	
									Tons/ 10 m	Tons/ 8 m
29	CILEBAR	SUKARATU	2.161	3,1	450	394	686	57%	59,10	47,28
30	PEDES	MALANGSARI	3.139	4	550	444	776	57%	66,60	53,28
31	CILAMAYA WETAN	TEGALSARI	4.698	3,8	644	708	1240	57%	106,20	84,96
32	KUTAWALUYA	MULYAJAYA	2.203	3,2	495	391	687	57%	58,65	46,92
33	CILEBAR	CIPTAMARGI	5.540	3,3	915	928	1662	56%	139,20	111,36
34	PEDES	PAYUNGSARI	7.081	3,9	1.186	1.008	1819	55%	151,20	120,96
35	TIRTAJAYA	SUMURLABAN	3.514	3,2	573	604	1094	55%	90,60	72,48
36	CIBUAYA	KERTARAHAYU	4.589	3,6	653	688	1262	55%	103,20	82,56
37	CILEBAR	PUSAKAJAYA UTARA	4.480	3,6	622	661	1224	54%	99,15	79,32
38	TALAGASARI	KALISARI	4.220	3,6	792	633	1182	54%	94,95	75,96
39	CILAMAYA KULON	MANGGUNGJAYA	5.735	3,8	834	805	1513	53%	120,75	96,6

No	Subdistricts	Villages	Populat-ion	Ave Persons per Family	Household (Hh)					
				#/family	Jan-May	THH (PPLS 2012)	Hh (SP 2010)	% THH	Raskin Quota Tons/10 m Pagu Raskin (ton) 8 bulan	
									Tons/ 10 m	Tons/ 8 m
40	JATISARI	JATIRAGAS	5.201	4	663	687	1295	53%	103,05	82,44
41	JATISARI	BARUGBUG	4.007	3,5	619	602	1135	53%	90,30	72,24
42	TELUKJAMBE BARAT	PARUNGSARI	3.922	3,8	640	546	1040	53%	81,90	65,52
43	BANYUSARI	BANYUASIH	2.733	3,3	414	440	839	52%	66,00	52,8
44	PEDES	DONGKAL	3.869	3,3	683	622	1188	52%	93,30	74,64
45	JAYAKERTA	MAKMURJAYA	3.927	3,9	692	524	1001	52%	78,60	62,88
46	TIRTAMULYA	TIRTASARI	4.082	3,8	528	556	1063	52%	83,40	66,72
47	TIRTAJAYA	TAMBAKSARI	7.222	3,6	1085	1.028	1977	52%	154,20	123,36
48	TIRTAMULYA	KAMURANG	3.087	3,3	496	485	934	52%	72,75	58,2
49	JAYAKERTA	CIPTAMARGA	8.173	4,4	1018	941	1855	51%	141,15	112,92
50	RENGAS-DENGKLOK	DUKUHKARYA	4.488	3,7	775	615	1216	51%	92,25	73,8

No	Subdistricts	Villages	Populat-ion	Ave Persons per Family	Household (Hh)					
				#/family	Jan-May	THH (PPLS 2012)	Hh (SP 2010)	% THH	Raskin Quota Tons/10 m Pagu Raskin (ton) 8 bulan	
									Tons/ 10 m	Tons/ 8 m
	Total 50 Villages					**34.178**	**57.510**	**60%**	**5.126,70**	**4.101,36**
	Total Fortified Raskin:110% from quota								**5.639,37**	**4.511,50**

ATTACHMENT 6. LIST OF SUPPLIERS SENDING QUOTATIONS FOR PREMIX AND DIGITAL FEEDER

Premix

FIRM	CONTACT	SPECIFICATION	COST	DELIVERY	VALIDITY OF QUOTATION	WARANTY
DSM Singapore 2 Havelock Road #04-01 Singapore 059763 Tel 65-66326633	Yannick	Analytical specifications : Iron 64-80 ppm, zinc 24-30, vit B1 51.2-64 ppm, folic acid 1776-2220 mcg/100 g, vit B12 80-100 mcg/100 g, niacin amide 48-60 ppm	3500 USD per tons FOB Shanghai	35 days manufacturing in the factory Delivery time must be added by shipment time from the factory to Shanghai seaport – Jakarta seaport – delivery site		12 months at storage temperature 18-20 C

DSM premix kernel

Colored DSN premix kernel

Digital Volumetric Feeder

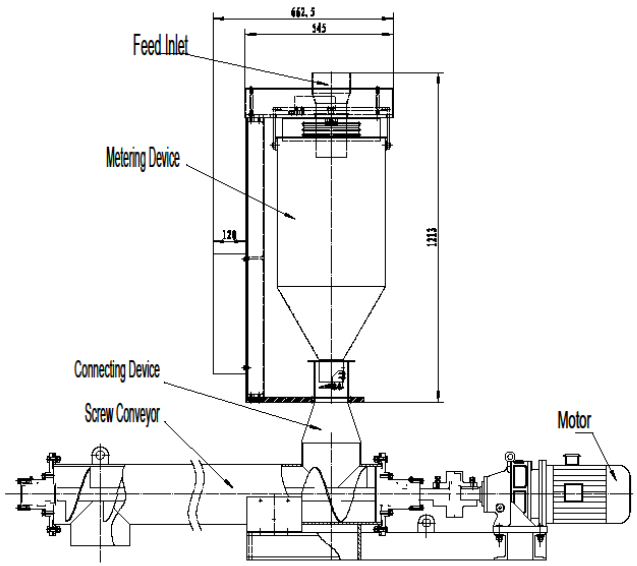
	FIRM	CONTACT	TYPE	SPECIFICATION	TOTAL COST FOR THREE UNITS	DELIVERY	VALIDITY OF QUOTATION	WARANTY
1	COPERION K-TRON ASIA Pte Ltd	TECK KIM CHOO (+65 6899-7255). Email: TKChoo@ktronasia.com.sg	K-TRON MODULAR VOLUMETRIC FEEDER, MODEL K2-MV-S60	minimum rate feeder : 30 kg/hrs and hopper capacity: 50 L thoughput rate: min 30kg/hrs, Max 50 Kg/hrs screw: single auger, tube: 40 mm diameter, gearbox : hi, DC motor: 450W, 200V, IP65 hopper capacity: 50 L Agitator connecting with screw at gear box.	**USD 51,074**	APPROXIMATELY 10 WEEKS AFTER RECEIPT OF LETTER OF CREDIT AND CLARIFICATION OF COMMERCIAL AND TECHNICAL DETAILS	60 DAYS FROM 19 NOVEMBER 2013	MECHANICAL AND ELECTRICAL PARTS = 1 YEAR; LOAD CELLS ONLY: 5 YEARS

	FIRM	CONTACT	TYPE	SPECIFICATION	TOTAL COST FOR THREE UNITS	DELIVERY	VALIDITY OF QUOTATION	WARANTY
2	INDOSCALE INSTRUMEN	R. MIRAWATI (021-56944222, 5667353)	VOLUMETRIC FEEDER AccuRate Series 602 DC, EXTENTION HOPPER MODEL 651R-001	Feed rate range : 30 - 150 dm3/h (l/h); Temperature : Max 80 C degree; Feeder with Helix and Nozzle, DC drive 0.18 kW, 90 VDC; Agitation with Paddles-system; Extension Hopper 70 dm3, 651R-001, SANITARY; Hopper Volume: 2.5 cubic feet (70dm3)	**USD 66,562**	APPROXIMATELY 4-5 MONTHS AFTER RECEIVING PURCHASE ORDER AND DOWN PAYMENT	30 DAYS FROM 7 NOVEMBER 2013	1 YEAR FROM THE DATE OF SHIPMENT
3	GERICKE INDONESIA	C. KURNIAHDIE (021 6884 4288) - 0816 483 7227	VOLUMETRIC FEEDER WITH HOPPER, MODEL GAC 207	Feeding Rate of GAC is 14-300kg/hr Hopper Capacity- 100 Litre the vertical agitator on the hopper has direct drive motor screw: single auger, tube: 40 mm diameter, gearbox : hi, DC motor: 450W, 200V, IP65	**USD 68,736.14**	18 - 20 WEEKS UPON RECEIPT OF OFFICIAL PO AND DEPOSIT	60 DAYS FROM 4 OCTOBER 2013	1 YEAR FROM THE DATE OF SHIPMENT

	FIRM	CONTACT	TYPE	SPECIFICATION	TOTAL COST FOR THREE UNITS	DELIVERY	VALIDITY OF QUOTATION	WARANTY
4	SCHENCK INDONESIA (PT NEW MODULE INTERNATIONAL)	SUMIHAR TORUAN (021 - 3857751) - 08179191677	VOLUMETRIC FEEDER AccuRate Series 602 DC, EXTENTION HOPPER MODEL 651R-001	Feed rate range : 30 - 150 dm3/h (l/h); Temperature : Max 80 C degree; Feeder with Helix and Nozzle, DC drive 0.18 kW, 90 VDC; Agitation with Paddles-system; Extension Hopper 70 dm3, 651R-001, SANITARY; Hopper Volume: 2.5 cubic feet (70dm3)	**USD 91,377**	8 WEEKS AFTER RECEIVED PURCHASE ORDER AND COMERCIAL PAYMENT	30 DAYS FROM 8 NOVEMBER 2013	1 YEAR AFTER COMMISSIONING
5	CV. KARUNIA MITRA	ARIEF CH (0812 1212 7710) - PAK EKO 59490083	K-TRON MODULAR VOLUMETRIC FEEDER, MODEL K2-MV-S60	minimum rate feeder : 30 kg/hrs and hopper capacity: 50 L thoughput rate: min 30kg/hrs, Max 50 Kg/hrs screw: single auger, tube: 40 mm diameter, gearbox : hi, DC motor: 450W, 200V, IP65 hopper capacity: 50 L Agitator connecting with screw at gear box.	**USD 155,812.5**	EFFECTIVE DELIVERY : 12-14 WEEKS AFTER RECEIPT OF PO AND CLARIFICATION OF COMMERCIAL AND TECHNICAL DETAILS.	7 DAYS FROM DATE OF OFFER (25 OCTOBER 2013)	MECHANICAL AND ELECTRICAL PARTS = 1 YEAR, WARRANTY PERIOD STARTS FROM EX-WORKS DATE

	FIRM	CONTACT	TYPE	SPECIFICATION	TOTAL COST FOR THREE UNITS	DELIVERY	VALIDITY OF QUOTATION	WARANTY
6	HENAN FENGBO AUTOMATION CO., LTD.	TILLY FENG (0086-371-56981162; 0086-18703682028; tilly@fengbo.co.cn)	VOLUMETRIC FEEDER MODEL GM400	Ambient Temperature: -20c - 100c; Working Voltage: AC380V 50Hz; Measuring Accuracy: ±0,4%; Material Moisture: , ≤ 2%; Feeding Speed: 0,03m3/h - 300m3/h; Communication Interface: RS 485, Mod-bus	USD 47,121.98	EFFECTIVE DELIVERY: WITHIN 30 DAYS AFTER RECEIVING THE DEPOSIT WITH PURCHASE ORDER	30 DAYS FROM 25 NOVEMBER 2013 (25 DECEMBER 2013)	1 YEAR

Notes:
Evaluation on the four quotations:
1. Henan Fengbo is the most reasonable for the price and delivery time (one month).
Four critical points: electricity 380 V, connection through screw conveyor, handling of machinery to exit the sea port, installation and commissioning
2. Coperion Ktron Asia is the second choice for the price.
Three critical points: 10 weeks delivery time, connection through screw conveyor, handling of machinery to exit the sea port, installation and commissioning
Agent in Indonesia: trial prior to purchase could be suggested



ATTACHMENT 7. PROTOCOL FOR HOMOGENEITY DETERMINATION

Sampling Technique

Sampling technique is a very decisive part of the lab analysis results. Samples for lab analysis should be a representation of population that are on the ground (called the distinguished representative sample), namely:

1. Compositions containing the same material with the original material
2. Represent quantitatively from the sample in the test
3. Samples must be physically and chemically maintained its stability

Sampling Method

1. Sample size
    a. Less than 10 sacks, the sampling is done on the whole sack.
    b. Larger than 10 sacks, the sampling is done from the number of sacks = square root of the total number of sacks.
2. Sampling tools
    a. Manual (hand)
    b. Sample probe / Stick trier
    c. Sample nobbe
    d. Sample pan
3. Sampling points for sacks
    Samples were taken from at least 3 different points
4. Sampling analysis
    For quantitative analysis, all the collected samples will be mixed well, and 100 g composite sample will be taken. If duplo is carried out for the analysis, then 2 composite samples will be taken.

Sampling in the Supply Chain

1. Arrival Premix
    Composite sample of 100 g will be taken for each BULOG RMU from 15 sacks of the premix selected randomly out of 667 sacks. Note that total amount of premix is 2000 sacks for each 25 kg package. Square root of 2000 is equal to 45.

2. Sampling Premix on Warehouse Storage
    Composite sample of 100 g will be taken every month for each BULOG RMU from 10 sacks, each from one rack, taken into consideration the location at the top, bottom, and middle layer of the rack.

3. Sampling FR at Pre-mixing Trial

   In the pre-mixing trial, 100 g composite sample will be taken from collected samples at the exit of vibrating shifter, at every hour. The pre-mixing trial will be observed for three days in a row after successful operation has been achieved.

4. Sampling FR at Production Process.

   In production process, 100 g composite sample will be taken from collected FR grains from every 4 hour of operations, every 7 day of operation

5. Sampling FR at BULOG Warehouse

   Composite samples will be taken from 12 randomly selected sacks of 15 kg at every two week in the storage.

6. Sampling FR in point of Distribution (1) (Head of Village)

   Sampling at the Office of Head of Village will be done at the time Fortified Raskin arrives at the site. Composite samples will be taken from 10 sacks selected randomly for 5 villages out of 50 targeted villages at every two months.

7. Sampling FR in point of Delivery (2) (Head of sub-village or RW)

   Sampling at the Office of head of sub-village/RW will be done at the time Fortified RASKIN arrives at the site. Composite samples will be taken from 1 sacks at every 5 sub-villages at the selected 5 villages in item 6 at every two months.

8. Sampling FR in Household

   Sampling will be conducted 3 days after FR received by RTS. Composite sample of 100 g rice and 100 g cooked rice will be drawn from 5 RTS at each 5 sub-villages at the selected 5 villages in item 6 at every two months. Samples taken should be replaced by some money for the household family.

Determination of Homogeneity

1. Satisfy value of Fortified RASKIN: Fortified Raskin said to be satisfied if the iron content of a substance is equal to the desired target with a tolerance limit of plus-minus 10%.

No of Samples	Result Analysis : number of samples falls inside or out of the standard criteria range	
	Iron content (72 ± 8) ppm	Weigh of colored premix content (1± 1.2) g premix/100 g rice
1	+	+
2	+	-

3	_	+
4	-	+
…		
N	M+	P+
Homogeneity		
Samples are called homogenous when the homogeneity is ≥ 90 %		

*) + : samples fall inside the criteria range

- : samples fall out of the criteria range

$$\text{Homogeneity based on iron analysis} = \frac{M_+}{N} \times 100\%$$

$$\text{Homogeneity based on colored premix analysis} = \frac{P_+}{N} \times 100\%$$

N = the number of samples analyzed

M_+ = the number of samples fall inside the iron content criteria

P_+ = the number of samples fall inside the colored premix content criteria

2. Calculate the mean, standard deviation, and Coefficient of Variation of samples taken from pre-mixing trial. During the blending process, 100 g samples will be taken every hour from the outlet to the packaging or fortified rice. When the value is fallen out of range of mean ± 2 standard deviations for five times in a row, the process will be stopped and the machinery has to be checked if they need adjustment and or repaired.

Recapitulation of Number of Samples for Analysis

No	Sample Description	Sampling	Total Samples	Analysis
	Arrival Premix	3 RMU x 1	3	Full : iron and other micro nutrient
	Premix stored in warehouse	3 RMU x 8 months	24	Iron and homogeneity
	FR pre-mixing trial	1 RMU x 8 hours x 3 days	24	Iron and homogeneity
	FR production process	3 RMU x 2/dayx 2/2 weeks	12	Iron and homogeneity
	FR in warehouse	3 RMU x 2/2 weeks	6	Iron and homogeneity
	FR in Distribution Points	5 villages x 4/2 months	20	Iron and homogeneity
	FR in Delivery Points	5 sub-villages x 5 villages x 4/2 months	100	Iron and homogeneity
	FR and cooked rice in Households	2 types x 5 sub-villages x 5 villages x 4/2 months	200	Iron and homogeneity
	Grant total samples		389	

ATTACHMENT 8. LIST OF SOPS ACCOMMODATING QA AND QC TO BE DEVELOPED

Level of use	Instrument/SOP	Short description of instrument/SOP	Responsible party for drafting SOP	End User
Internal monitoring	**01:** SOP for premix storage handling	Storage handling steps for premix	ACI	BULOG RMU
Internal monitoring	**02**: Monthly premix inventory log book	Instrument to track amount of premix used, mainly to anticipate need for new orders and to ensure FIFO (first-in first-out) practice	ACI	BULOG RMU
Internal monitoring	**03**:Premix QC log book	Instrument to ensure premix entry quality control : iron, and other micronutrient contents	ACI	BULOG RMU
Internal monitoring	**04**: Premix specification sheet	„Cheat“ sheet for premix receiving agent for easy comparison with delivered premix and the ordered premix	ACI	BULOG RMU
Internal monitoring	**05**: SOP for feeder calibration	SOP for initial feeder calibration	ACI	BULOG RMU
Internal monitoring	**06:** SOP for blending process	SOP for blending process	ACI	BULOG RMU
Internal monitoring	**07.A**: Daily QC log for fortified rice	Core QC log based on bags of premix used vs. bags of natural rice use, feeder checks	ACI	BULOG RMU
Internal monitoring	**07.B**: Monthly quality control log for fortified rice	Synthesis of daily QC log for reporting purposes	ACI	BULOG RMU
Internal monitoring	**08:** SOP for sampling method for blending process	SOP in taking samples during the blending process	ACI	BULOG RMU
Internal monitoring	**09.A**: Quantitative methods for testing iron in fortified rice	SOPs adapted from AACC or AOAC for quantitative iron analysis, including QC	ACI, BBIA, BPOM	BBIA, BPOM

Level of use	Instrument/SOP	Short description of instrument/SOP	Responsible party for drafting SOP	End User
Internal monitoring	**09.B**: Quantitative methods for testing folic acid in fortified rice	SOPs adapted from AACC or AOAC for quantitative iron analysis, including QC	ACI, BBIA, BPOM	BBIA, BPOM
Regulatory /external monitoring	**10**: Questionnaire for laboratory evaluation	Questionnaire to assess lab capacities for relevant micronutrients	ACI	BPOM, BBIA
Regulatory /external monitoring	**11**: Audit checklist for blending operation	Checklist for regular auditing of the RMU's	ACI, BPOM	BPOM
Regulatory /external monitoring	**12**: SOP for inspection sampling at the factory	SOP specific to correct sampling during inspection/audits	ACI, BPOM	BPOM
Regulatory /external monitoring	**13**: Sampling framework for external QC	Visiting and sampling scheme for inspection/audits	ACI, BPOM	BPOM
Regulatory /external monitoring	**14:** Handling of complaints mechanism	Guidelines of handling complaints mechanism	ACI	Pemda, BULOG, Ministry of Agriculture, Tim Kor RASKIN
Commercial/House-hold monitoring	**15**:Commercial inspection SOP at distribution and delivery points	SOP describing how to sample, when to sample at distribution and delivery points	ACI	Ministry of Agriculture
Commercial/House-hold monitoring	**16**: Protocol for household consumption monitoring	Protocol describing sampling approach and procedures to estimate coverage and use at the household level	ACI	Ministry of Agriculture

ATTACHMENT 9. STABILITY TEST FOR PREMIX AND FORTIFIED RICE

Shelf Life

There are many changes that occur in foods during processing and storage (Man 2000). The various processing, distribution and storage parameters result in changes ofthe quality attributes of food. During storage at certain conditions (in particular temperature), one or more quality attributes will reach undesirable conditions. At that time, the food will become unfit for consumption and considered that the food has reached the expiration date or end of shelf life (Man 2000).

According to the Institute of Food Science and Technology (IFST1993), there are two factors that affect the breakdown of foodstuffs, namely intrinsic and extrinsic factors. Part of the intrinsic factors are a_w, pH, oxygen in the product, oxidation-reduction potential (Eh), content of nutrients, the total initial microbial, biochemical content of the product, and the use of preservatives. The intrinsic factors are influenced by conditions that include quality of raw materials, product formulation and structure of the dough.

As extrinsic factors are defined those factors that affect product quality along the food chain. Included in this group of factors are temperature-time profile during the process and the amount of pressure in the head space, temperature regulation during storage and distribution, RH conditions during the manufacturing process, storage and distribution, light exposure [UV and IR]), sanitary conditions, atmospheric conditions in the packaging, the existence of subsequent heat treatment before consumption of products, as well as the handling by the consumer. Both of these factors will interact and usually cannot be directly predicted.

According to Man (2000), there are three parts of the interactions (basic model of food deterioration) in degradation of food quality. The third part of this interaction occurs due to the factors previously mentioned. According to Corradini and Peleg (2007), accelerated destruction of foodstuffs by chemical reaction and increased temperature is certainly a common cause of food spoilage. Storage at higher temperatures may lead to acceleration of chemical, microbiological, and physical reactions.

Determination Method of Shelf Life Premix and Fortified RASKIN (FR)

The shelf lif determination of Premix and FR was conducted using the Accelerated Shelf Life Test (ASLT) used to accelerate the deterioration of the effect of temperature using the Arrhenius approach. Storage temperature used is 40 °C, 50 °C, 60 °C. Critical parameters chosen are folic acid, because among the ingredients added to the premix, folic acid has the characteristics of the most unstable.

Determination of Shelf Life Premix and FR with the Arrhenius model be described below:

a. Five samples each 300 g of premix and FR prepared for 3 different temperatures are stored at 40°C, 50°C and 60°C
b. Folic acid analysis performed on days 0, 7,14, 21, and 28.
c. The results of the data from product analysis over time, will be plotted and linear regression equation will be calculated. Then there are three regression equations for the three temperature conditions of storage products using Y = a + bx, where Y = value Premix characteristics, X = the amount of time (days), a = value at the beginning of the storage characteristics of Premix, b = rate of change of characteristic values (b value equals the value of k).
d. From each of these equations, the slope (b) will be obtained which is the reaction rate constant or quality reduction rate (k).
e. To determine the reaction order, a best fitted regression with the largest R^2 will be selected. ,
f. For the Arrhenius approach, the value of k is plotted against 1 / T (K^{-1}) and ln k valu^{e}s obtained from the intercept and slope of the linear regression equation ln k = ln ^{k0} -(E / R) (1 / T), where ln k_0 = intercept , / R = slope, E = activation energy and R = ideal gas constant = $_1$, 986 cal / mol^{o}K.
g. From equation at stage 5, the value of the constant k_0 is the pre-exponential factor and activation energ^y values characteristic changes premix instant reaction (Ea = E). Then determined the reaction rate equation model (k) changes in the characteristics of premix with $\mathbf{k = k_0 . e^{E / RT}}$ where T is the storage temperature, eg, room temperature = 25^{o}C. This equation is known as the Arrhenius equation.
h. With the Arrhenius equation, the calculation can be performed on the value of the Arrhenius constants (k) at a temperature (T) deviation determined.
i. Determination of key parameters by looking at the parameters that have the lowest activation energy.
j. Premix and FR shelf life is calculated using the equation of reaction kinetics, by order of the reaction, ie, if the reaction takes place on the order of zero, then the equation is At = A_0-kt, while using the first-order equation is ln A = ln A_0-kt, where A_0 is the concentration of A at the end of shelf life, and t is the shelf life.
k. For the determination of shelf life at room temperature is to put the value of temperature (25 ° C = 298 K) into the equation ln k = ln k_0-(E / R) (1 / T) and obtained values of k, then the value of k is inserted into the order equation to get a premix and FR shelf life.
l. Find concentration Folic Acid at time t by equation or by graph

Observation

Observation of changes in the concentration of folic acid in the premix and FR , performed on days 0, 7, 14, 21 and 28 days.

LIST OF PERSONS MEET WITH TECHNICAL TEAM IN MEETINGS AND PRELIMINARY MIXING TRIALS

Kick-Off Meeting and Second Meeting

Wolfgang Kubitzki, and Rooswanti Soeharno – ADB Indonesia

Kick-off Meeting. Bappenas (Chair the meeting – Vice Director of Health) , Kementan (Ministry of Agriculture), BULOG (Director of R&D, Provincial Head of BULOG Office- Divre West Java, District Head of BULOG – SubDivre Karawang District, all three Heads of BULOG RMU – UPGB, Kemenkes (Ministry of Health), Pemda (Regional Government) Karawang District.

Second Meeting. Bappenas (Chair the meeting – Secretary of the Project), Kementan (Ministry of Agriculture), BULOG (Staff of R&D, District Head of BULOG – SubDivre Karawang District, all three Heads of BULOG RMU – UPGB), Kemenkes (Ministry of Health), Pemda Karawang District.

Preliminary Mixing Trials and Consultancy

Sulais Damsu -Head of BULOG RMU Rengkas Dengklok

Aan Atmaja -Head of BULOG RMU Jatisari

Burhan Cokro Aminoto - Head of BULOG RMU Plumbon

Sunarno Ranu Widjojo - BAPPENAS

Riena Syawal and Sri Sulihanti – Ministry of Agriculture

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