Annex 2.5

Protocol for assessment of the existing Small Millet Processing Units (SMPUs)

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Scaling Up Small Millet Post-Harvest and Nutritious Food Products Project

Protocol for assessment of the existing Small Millet Processing Units (SMPUs)

Background

As part of different initiatives to revive small millet cultivation and consumption, small scale local community focused small millet processing units (SMPUs) were set up in small millet production cultivating locations in different parts of India over the past decade. These initiatives were supported by different entities – State an Central governments, non- governmental organizations and research Institutions such as TNAU. From anecdotal accounts, it is learnt that the utilization of these units varied a lot and there is considerable scope to improve their performance and utilisation. Under Scaling up Small Millets Post-harvest and Nutritious Food Products project anchored by DHAN Foundation in India, reviving and optimising the performance of these existing units is identified as an important intervention to promote local consumption of small millets in the production areas. As a first step in this direction, a protocol was prepared to undertake an initial assessment of the performance status of the SMPU established primarily to offer milling services to the local community. This protocol would also help in identification of training needs and areas of support for the SMPUs. The data collected also serves as a baseline for assessing the impact of the follow-up interventions for reviving and improving the performance of SMPUs.

Background understanding and assumptions behind assessment of SMPUs

Input material variability

Small millets are rainfed crops cultivated with minimal inputs and very likely using seeds saved in the farmers' families for many generations. These, and other environmental factors and cultural practices lead to a huge degree of variability in the grain characteristics – the size of the grain, density/specific gravity, hardness, elastic modulus, husk-grain bonding, bran layer thickness & composition, etc. So even when a machine has been tuned and an operator trained to process a given millet into its edible forms, the output of processing a new batch of millets, for example, from their own farm, cannot be assumed to be the same as what they were trained with. So it must be kept in mind that even for a trained individual, working with new material is a challenge. And that the trainings have to be augmented with continuing skill development to enhance their capabilities to deal with natural variations in input material.

A fully functional SMPU

A SMPU needs to meet certain prerequisite standards for it to be considered a fully functional unit that can be operationalized. A crucial aspect of this sub-project is identifying what
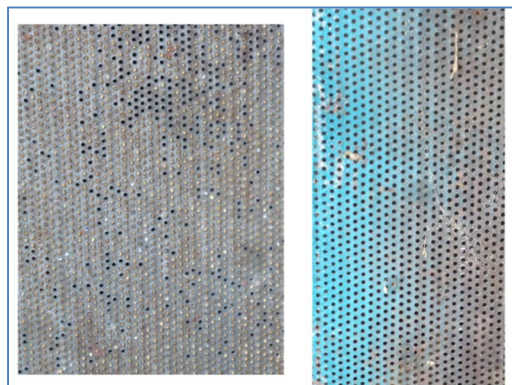
constitutes a fully functional small millet processing unit. Once these have been identified, developing an implementation plan becomes that much more objective and measurable.

After the first round of consultations with different stakeholders, a detailed list of different parameters was identified as being essential for a SMPU to be considered fully functional. This has been appended in Annex 1. These are broadly classified into four categories – 1) machine and infrastructure, 2) hard skills of the people running the SMPU, 3) soft skills of the people running the SMPU and 4) external/community factors. In the external/ community factors, utilisation of SMPU is given focus like quantum of processing, purpose of processing and user experience testimonials. What aspects of the SMPU are affected by each of these factors have also been identified and noted in the table. These four categories reflect the implicit understanding that addressing the critical infrastructure gaps, capacity building of the operators and addressing the concerns of the users are key for revival and/ or improving the utilisation of SMPU for ensuring local food and nutrition security.

In the following few paragraphs some of the salient factors are discussed in a little more detail.

Machines – correct size sieves for graders
One of the primary objectives of the SMPU is to reduce the drudgery of small millet processing. In order to do an effective job of this, the unit should have at least one machine each for grading, de-stoning and hulling/de-husking. For effective use of the destoner and huller, appropriate grading and cleaning in the grader is critical. It is extremely important to have the right size sieves for the grader, and know which sieve should be used in what position within the grader so that mechanized processing is effective and reduces the need to do manual processing.

Sieve before and after cleaning

Machines – control parameters
All of the machines – grader, de-stoner and huller – are fairly simple machines to operate. The control parameters of grader are i) screen size and ii) material flow rate. The control parameters of huller are i) material flow rate and ii) pulley ratio. The control parameters of destoner are i) air flow, ii) material flow rate and iii) bed angle. Though the de-stoner has three control parameters, for most practical purposes the bed angle does not need to be changed and once set properly can be considered a static parameter. So all together there are six machine control parameters in an SMPU that the operators would need to master.

The variations in the millets put into the machines needs to be dealt with effectively by using these six machine control parameters. Hence an understanding and ability to control the

machine functions using these parameters is very important. And maintaining the machines in such a condition that these parameters can be exercised is also important.

Documentation & Record keeping
The SMPU are being set up to meet either community requirements for processed millets and / or those of a commercial enterprise. This utilization is best documented by the individuals trained in millet processing. So along with skill development to better understand millet grains, millet rice, etc. the individuals would also be trained to maintain a utilization register that documents the users of the particular SMPU. Along with the users register, maintaining records of the maintenance and repair activities on the machines will help improve the reliability of the unit and to sustain and improve the quality of the output.

Limiting pest infestation
Even the best of processors today face major challenges when it comes to reducing pest infestations in the material they process. The primary reason that pests are seen in packed processed material is that pest eggs are getting deposited in the material as it is being processed in the SMPU. To maintain clean and hygienic conditions such that no residual material is left behind either within the machines, or outside on the processing floor is a mandatory discipline that all users of the SMPU have to develop. Any stray material lying around attracts pests and sustains local broods. Once these are established, it is extremely hard to remove.

Huller exit port – dusty & not cleaned for many days

It is important to realize that even the dust that accumulates within the room in which the SMPU is located is sufficient grounds for pest infestation to start. So it is important to not just remove the semi and fully processed millets, the byproducts of the processing such as the husk and bran rich materials, but also the dust that rises from the machines and settles on the rafters, girders, windows and any other parts of the structure housing the SMPU.

Quantifying efficiencies
There are three parameters that can be used to identify how efficient a SMPU is.

The **hulling efficiency** (bulk measure) is defined as the percentage of weight of the output edible material that is usable for human consumption, to that of the weight of the input material. In the process of cleaning, grading and hulling, some amount of usable / edible parts of the grains are removed along with the husk and dust in processing. The **hulling efficiency (bulk measure) for most of the small millets, when processing at village or micro enterprise scale, varies typically between 55 to 75%** i.e. anywhere from 25 to 45% of the millet grains, by weight, is husk, dust and foreign objects and gets removed in processing. If the hulling efficiency is less than this, it is an indicator that edible grains are being lost in processing. Higher the hulling efficiency, better the process and processing is.

Another parameter that helps quantify the detrimental effect of processing is the '**Broken percentage**'. It is the percentage of rice kernels that are broken relative to the number of kernels that are intact and whole. Given the input variations in every type of small millet, it is inevitable to get broken grains while processing. The process needs to be tuned such that the broken percentage is as low as practically possible. One would need to reduce the speed of the huller to decrease the broken percentage; but if it becomes too low, the hulling percentage will start dropping faster. So, the two efficiencies need to be balanced by the operator to identify the sweet spot to process the particular input material. A broken percentage of anywhere up to 25 number per 100 grains is normal. Please note that this could translate to about 5 to 15% by weight depending on the material, the extent of kernel shattering, etc.

The broken grains are edible and can be made into different products, but their shelf life is less. One needs to adopt a multi-product process flow approach rather than a single product process flow for ensuring utilization of broken grains.

The third efficiency parameter used to quantify the SMPU performance is the time taken to fully process a batch of millet grains – a round figure of 5kgs of millet grains is used as a standard

measure. The time measured includes not just the time taken for mechanized processing of the millets at the SMPU, but also the final cleaning of the material by the user to start cooking it. So when assessing for this parameter, one should look at the final output from the mechanized processing and estimate how much manual work would be needed to get that ready for cooking. On an average, it would take a *skilled person* about *3 hours of rigorous work* to process 5 kgs of millet grains, if one were to be doing all the steps manually. At a SMPU, mechanized processing of 5 kgs using destoner, grader and huller would typically take about 30 to 45 minutes and the final manual cleaning, would take about 15 to 30 minutes. The time needed would depend strongly on the quality of the final output from the mechanized processing and the skill levels of the person doing the final manual cleaning. Also the time taken for mechanized processing depends very strongly on the quality of the millet grains – if there are too many small foreign objects very similar in size and weight to the millet grains, the time taken to clean would be more. *The times given above should be used to get an idea of what the averages are like and should not be used as an absolute measure/standard.*

By-products of small millet processing

In processing millets using machines, we will end up with various components of the millet grain separated out and segregated. By developing each of these segregated millet grain components to a product that can be remunerative, one can recoup the cost of processing to a certain extent.

The **primary output** of the SMPU is the **millet rice**. The **secondary output is the broken millet rice kernels**. These are the main edible components obtained from the processing of millet grains. Other than these two, there are two minor components that are obtained from the SMPUs in sufficient volumes which can be commercially exploited namely (i) the millet husk and (ii) the bran rich flour with fine millet grits/brokens.

Collecting user experience testimonials

Testimonials about the experience of the SMPU users, mainly women users, would be important in understanding the utilization of the SMPU by the local community. It would also help better plan follow up activities to increase local consumption of millets and millet based products. The primary source of information of who among the community has used the SMPU should be the log book. In the absence of a log book, the reliability of the data goes down. From among the log book entries or the list given by the operator or supervisor of the SMPU, randomly select 5 users to talk to. If the number of users is large, randomly select another 5 users to talk to. Ensure that at least 50% of them are women. The data to be collected from the user through testimonials include 1) quantum of rice recovery from one unit of grain, 2) share of broken grains in the output, 3) quantum of work to be done manually after getting the SM processed at the SMPU for making the output ready for cooking, 4) polish level, 5) cooking quality and 6) usage of by-products. Record the perception of the users using a set of simple qualitative options. Compile the answers from these users in a separate table. Draw a summary from the data table and use it in the main SMPU status assessment spreadsheet.

The SMPU status assessment

In order to assess the status of the SMPU as discussed above, a survey needs to be undertaken. The number of questions and points to be observed and noted is significantly large in number. Hence caution should be exercised that those conducting the survey understand the various aspects being surveyed and use appropriate conversation, observation and sampling techniques to ensure a good and true assessment of the situation.

Training those conducting assessment survey

It is necessary that those conducting the assessment are given adequate practical training. The main areas in which one would need training to do a good assessment of the status of SMPUs are:

- Local language proficiency and basic skills in data collection through interviews
- Appreciation of the local socio-economic-political situations in and around the SMPU
- Proficiency in reading the quality of the millet grains, the millet rice and the other SMPU outputs
- Knowledge and understanding of the millet processing machines and process flow for mechanized processing of different millet grains
- Dealing with variations in the input materials
- Understanding of the electrical and mechanical components of the SMPU
- Storage techniques and identifying signs of pest infestation
- Utilization of different byproducts of millet processing generated from a SMPU
- Planning agenda, logistics and route for assessing multiple SMPUs

Conducting the SMPU status assessment

In planning the route map of the different SMPUs to be assessed, it is important to ensure that

1. The local operators and active community users are notified in advance for their active participation.

2. There is electricity and the machines in the SMPU are in working condition.

3. There is ample quantity of grains to be trial processed (at least 5kg of each type) either with the SMPU or the assessment survey taking person.

4. Checklist of tools and accessories the assessment surveyor should carry:
   i. Data recording sheets
   ii. A portable weighing balance, either battery operated or mechanical type. In case of mechanical type necessary standard weights should also be taken.
   iii. Pen & pencil
   iv. Ruler / measuring scale
   v. Sample collection kit (small covers, marker pen, stapler)
   vi. Camera
   vii. Voice recorder
   viii. Torch / flash light
   ix. Test sieves
   x. Tester
   xi. RPM meter
   xii. Clamp meter (to measure power drawn)

The assessment survey should be taken up in a planned and phased manner. The details of the methods and criteria for assessing the status of an SMPU according to each parameter are presented in the table in the Annex 1. Some of the process aspects to be given attention are:

1. The initial focus has to be on observing the infrastructure and machine related aspects of the SMPU.

i. The presence and utilization of various safety equipment, sieves and other tools required for cleaning the machines and the SMPU need to be noted.

ii. The installation of machines, storage of tools and spares, the wear and tear on the machine control mechanisms all need to be not just enquired about but must be observed closely

2. In assessing the hard and soft skills, as far as possible conversations should be conducted while handling and discussing some of the millets being processed and in the context of the processing of the particular material. It would be advisable to avoid conversations centered on recalling from memory or theoretical discussions as much as possible.

3. While assessing the utilization of the SMPU, it is important to look at the records maintained at the SMPU. If records are not maintained, conversations with different community members might be needed to get a full picture.

4. As far as possible notes, audio and video documentation of the interactions and of the samples of different forms of millets – grains, rice, husk, other by products – should be diligently collected, labeled and documented.

Documentation of the assessment surveys

Once the assessment survey has been conducted, it is important that the observations are compiled. An entry needs to be added to the survey spreadsheet and details recorded for each of the identified SMPU status parameter. An example of this can be seen in the survey data compiled for the SMPUs in Jawadhu Hills, Tamil Nadu in Annex 2. The collected audio, photos and videos need to be appropriately labeled, tagged for content keywords and cataloged for future reference and use in preparing testimonials and other documentation formats.

Development of plan for strengthening SMPUs

1. The process of assessing the initial status of the SMPUs is first undertaken.

2. Once completed, a full machine and infrastructure servicing plan will be developed and implemented.

3. Next training and skill development sessions will be organized for SMPUs having similar machines

4. On completion of training, intensive campaigns would be undertaken in the SMPU villages to increase the visibility of the processing units and their utilization

5. After each round of intervention, an assessment of the functionality and utilization of the SMPU would be undertaken.

Annex 1

List of parameters to be used for the assessment of small millet processing unit at the village level

Category	Sl. No.	Parameter	Has an effect on …	Measurement of parameter
I. Machine and infrastructure	1	Accessible location	Visibility, Utilization	In the main road or not; in the village or outside the village; part of rice mill or not
	2	Electricity	Existential	Single phase or three phase; No. of HP; No. of motors, status of infrastructure
	3	Clearly visible and legible display /sign boards in the local language	Visibility, Utilization	Yes/ No/ Present but needs improvement
	4	Designated operators	Reliability, Utilization	Yes/ No; Supervisor operates / employee / community member on hire
	5	Machines installed – Grader	Existential	Yes/ No; if yes, capacity in kgs/hour
	6	Machines installed – Destoner	Existential	Yes/ No; if yes, capacity kgs/hour
	7	Machines installed – Huller	Existential	Description– Single chamber/ Double chamber; capacity in kgs/hour
	8	Machines operational - Grader	Existential	Yes/ No/ Not applicable (NA)
	9	Machines operational - Grader - Screens needed for local small millets	Existential	Yes/ No/ NA
	10	Machines operational - Destoner	Existential	Yes/ No/ NA
	11	Machines operational - Huller	Existential	Yes/ No/ NA
	12	Repairs done on machines in the last year	Reliability, Utilization	No repairs/ Description of the repair; who repaired
II. Hard skills	13	Start up and shut down of machines	Reliability, Utilization	Good / Ok but needs training

Category	Sl. No.	Parameter	Has an effect on …	Measurement of parameter
II. Hard skills…	14	Understanding and ability to use machine control parameters – Grader – Screen selection	Quality of SM output, Visibility	Yes/ No/ NA
	15	Understanding and ability to use machine control parameters – Grader – Flow rate	Quality of SM output, Visibility	Yes/ No/ NA
	16	Understanding and ability to use machine control parameters – Destoner – Flow rate	Quality of SM output, Visibility	Yes/ No/ NA
	17	Understanding and ability to use machine control parameters – Destoner – Fan window setting / air flow rate	Quality of SM output, Visibility	Yes/ No/ NA
	18	Understanding and ability to use machine control parameters – Destoner – Bed angle	Quality of SM output, Visibility	Yes/ No/ NA
	19	Understanding and ability to use machine control parameters – Huller – Flow rate	Quality of SM output, Visibility	Yes/ No
	20	Understanding and ability to use machine control parameters – Huller – Pulley selection	Quality of SM output, Visibility	Yes/ No/ NA
	21	Log book – Usage of SMPU	Existential	Yes/ No
	22	Log book – Repairs	Reliability, Utilization	Yes/ No
	23	Cleaning procedures – Husk removal from premises	Pest control, value realization, work environment	Yes/ No
	24	Cleaning procedures – Storage of processed material	Pest control, value realization, work environment	Yes/ No/ NA
	25	Periodic maintenance tasks - Motor mounts	Reliability, Utilization	Yes/ No
	26	Periodic maintenance tasks - Pulleys	Reliability, Utilization	Yes/ No
	27	Periodic maintenance tasks - Belts	Reliability, Utilization	Yes/ No
	28	Periodic maintenance tasks - Greasing	Reliability, Utilization	Yes/ No
	29	Problem identification skills – Change in the running sound of the machines	Reliability, Utilization	Yes/ No/ May be

Category	Sl. No.	Parameter	Has an effect on …	Measurement of parameter
II. Hard skills…	30	Problem identification skills – Wear and tear of critical components – Sieves / screens	Quality of SM output, Efficiency, reliability	Yes/ No/ May be/ NA
	31	Problem identification skills – Wear and tear of critical components – Drive belts	Reliability, Work Environment	Yes/ No/ May be
	32	Problem identification skills – Wear and tear of critical components – Flow control valve / gate mechanism	Reliability, Work Environment, Quality of SM output	Yes/ No/ May be
	33	Problem identification skills – General Fitness of machines – Loose nuts/bolts – used for motor mounting	Reliability, Work environment	Yes/ No/ May be
	34	Problem identification skills – General Fitness of machines – Loose nuts/bolts – Body frame joints & covers	Reliability, Work environment, Quality of SM output	Yes/ No/ May be
	35	Problem identification skills – General Fitness of machines – Wear out of welded joints	Reliability, Work environment, Quality of SM output	Yes/ No/ May be/ NA
	36	Basic trouble shooting – Changing belts	Reliability, Work environment	Yes/ No/ May be
	37	Basic trouble shooting – Replacing pulley	Reliability, Work environment	Yes/ No/ May be
	38	Basic trouble shooting – Clearing clogged screens in graders and destoner bed	Quality of SM output, Efficiency, reliability	Yes/ No/ May be/ NA
	39	Basic trouble shooting – Electrical switches & connections– *To be able to identify a faulty connection and either repair and make a safe connection or know that they should not do anything and should call an electrician*	Reliability, Work environment	Yes/ No/ May be
III. Soft skills	40	Ability to identify quality of grains	Quality of SM output, Efficiency, Reliability	Yes/ No
	41	Screen selection for effective grading of SMs	Quality of SM output, Efficiency, Reliability	Yes/ No/ NA

Category	Sl. No.	Parameter	Has an effect on …	Measurement of parameter
III. Soft skills…	42	Understanding what needs to be taken out to get quality output – Stones, pebbles and sand	Quality of SM output, Visibility, Efficiency	Yes/ No/ May be
	43	Understanding what needs to be taken out to get quality output – Weed seeds and foreign objects	Quality of SM output, Visibility, Efficiency	Yes/ No/ May be
	44	Understanding what needs to be taken out to get quality output – Grains that are too small & unfilled / immature grains	Quality of SM output, Visibility, Efficiency, Value realization	Manually: Yes/ No; Using Machines: Yes/ No.
	45	Understanding what needs to be taken out to get quality output – Unhulled grains from the processed SM rice	Quality of SM output, Visibility, Efficiency	Using machines: Yes/ No / Partly; Manually: Yes/ No / Partly
	46	Efficiencies - Hulling efficiency	Efficiency, Quality of SM output	Below average/ Average/ Above average
	47	Efficiencies - Broken percentage	Efficiency, Quality of SM output	Below average/ Average/ Above average
	48	Efficiencies - Time taken to process 5 kgs	Efficiency, Quality of SM output	Time taken in hours; Below average/ average/ above average
	49	Handling of by-products – Do you know what is it fit to be used for?	Value realization, Visibility	Yes/ No
	50	Handling of by-products - What is being done with it now?	Value realization, Visibility	Used or not; actual usage as understood by the operator
	51	Real world challenges encountered so far	Reliability, Visibility	Description of the challenges actually faced
	52	Solutions found to overcome the real world challenges encountered	Reliability, Visibility	Description of the solutions actually tried
IV. Utilization of SMPU	53	Number of users in the last month living less than 5 kms away	Visibility, Utilization	In number
	54	Number of users in the last month living more than 5 kms away	Visibility, Utilization	In number
	55	Little millet - quantity processed in the last month	Visibility, Utilization	In Kg
	56	Foxtail millet - quantity processed in the last month	Visibility, Utilization	In Kg

Category	Sl. No.	Parameter	Has an effect on …	Measurement of parameter
IV. Utilization of SMPU…	57	Kodo millet – quantity processed in the last month	Visibility, Utilization	In Kg
	58	Proso millet – quantity processed in the last month	Visibility, Utilization	In Kg
	59	Barnyard millet – quantity processed in the last month	Visibility, Utilization	In Kg
	60	Processing purpose - For consumption by local families	Visibility, Utilization	In Kg
	61	Processing purpose - For sale of SM rice - directly to customer	Visibility, Utilization	In Kg
	62	Processing purpose - For sale of SM rice - to traders	Visibility, Utilization	In Kg
	63	User experience testimonials - quantum of processed rice per one unit of grain processed	Efficiency, Quality of SM output, Utilization	Meets expectation/ Below expectation
	64	User experience testimonials – Share of broken grains in the output	Efficiency, Quality of SM output, Utilization	Less/ High/ Too high
	65	User experience testimonials – quantum of work to be done manually after getting the SM processed at the SMPU for making the output ready for cooking	Efficiency, Quality of SM output, Utilization	Not significant/ Still quite a bit/ Too much
	66	User experience testimonials - polish level	Efficiency, Quality of SM output, Utilization	From inspection of the processed material: Unpolished/ Not polished enough / Ok/ Too much polished
	67	User experience testimonials - cooking quality	Efficiency, Quality of SM output, Utilization	Good/ Not good
	68	User experience testimonials - Usage of by products	Efficiency, Quality of SM output, Utilization, Value realization	Actual usage by the users

Annex 2

Assessment spread sheet for two small millet processing units at Jawadhu Hills

Category	Sl. No.	Parameter	SMPU in Jamunamarathur Run by: Mrs. Rajalakshmi Contact phone No.: Established by LAMP	SMPU in Athipattu Run by: Mr. Selvaraj Contact phone No.: 9751292150 Established by DHAN
I. Machine and infrastructure	1	Accessible location	Main road; part of agro processing unit	Main road; in the village; part of a rice mill
	2	Electricity	Three phase; 5 HP (3 phase) motor on huller	three phase; 30 HP, 3+ motors
	3	Clearly visible and legible Display /sign boards in the local language	Yes	No
	4	Designated operators	Yes	Yes
	5	Machines installed - Grader	Yes	Yes
	6	Machines installed - Destoner	Yes	No
	7	Machines installed - Huller	Yes	Yes
	8	Machines operational - Grader	Yes	Yes
	9	Machines operational - Grader - Screens needed for local small millets	No	Yes
	10	Machines operational - Destoner	Yes	NA
	11	Machines operational - Huller	Yes	Yes
	12	Repairs done on machines in the last year	Grader, destoner, huller - repair by Victor	Motor replaced
II. Hard skills	13	Start up and shut down of machines	Good	Good
	14	Understanding and ability to use machine control parameters - Grader - Screen selection	Yes	Yes
	15	Understanding and ability to use machine control parameters - Grader - Flow rate	Yes	Yes
	16	Understanding and ability to use machine control parameters - Destoner - Flow rate	Yes	NA

II. Hard skills...	17	Understanding and ability to use machine control parameters - Destoner - Fan window setting / air flow rate	Yes	NA
	18	Understanding and ability to use machine control parameters - Destoner - Bed angle	No	NA
	19	Understanding and ability to use machine control parameters - Huller - Flow rate	Yes	Yes
	20	Understanding and ability to use machine control parameters - Huller - Pulley selection	Yes	NA
	21	Log book - Usage of SMPU	No	No
	22	Log book - Repairs	No	No
	23	Cleaning procedures - Husk removal from premises	Yes	Yes
	24	Cleaning procedures - Storage of processed material	No	NA
	25	Periodic maintenance tasks - Motor mounts	Yes	Yes
	26	Periodic maintenance tasks - Pulleys	Yes	Yes
	27	Periodic maintenance tasks - Belts	Yes	Yes
	28	Periodic maintenance tasks - Greasing	Yes	Yes
	29	Problem identification skills - Change in the running sound of the machines	Yes	Yes
	30	Problem identification skills - Wear and tear of critical components - Sieves / screens	Yes	Yes
	31	Problem identification skills - Wear and tear of critical components - Drive belts	Yes	Yes
	32	Problem identification skills - Wear and tear of critical components - Flow control valve / gate mechanism	Yes	Yes
	33	Problem identification skills - General Fitness of machines - Loose nuts/bolts - used for motor mounting	Yes	Yes
	34	Problem identification skills - General Fitness of machines - Loose nuts/bolts - Body frame joints & covers	Yes	Yes

II. Hard skills...	35	Problem identification skills - General Fitness of machines - Wear out of welded joints	Yes	Yes
	36	Basic trouble shooting - Changing belts	Yes	Yes
	37	Basic trouble shooting - Replacing pulley	No	Yes
	38	Basic trouble shooting - Clearing clogged screens in graders and destoner bed	Yes	Yes
	39	Basic trouble shooting - Electrical switches & connections	Yes	Yes
III. Soft skills	40	Ability to identify quality of grains	Yes	Yes
	41	Screen selection for effective grading of SMs	Yes	Yes
	42	Understanding what needs to be taken out to get quality output - Stones, pebbles, and sand	Yes	Yes
	43	Understanding what needs to be taken out to get quality output - Weed seeds and foreign objects	Yes	Yes
	44	Understanding what needs to be taken out to get quality output - Grains that are too small & unfilled / immature grains	Machine- yes	Machine- yes
	45	Understanding what needs to be taken out to get quality output - Unhulled grains from the processed SM rice	Manual- partly	Manual- No
	46	Efficiencies - Hulling efficiency	Average	Average
	47	Efficiencies - Broken percentage	Above average	Above average
	48	Efficiencies - Time taken to process 5 kgs	3 hr- Above average	2 hr- Above average
	49	Handling of by-products - Do you know what is it fit to be used for?	Yes	Yes
	50	Handling of by-products - What is being done with it now?	Used; as *rava* (grits)	Used; as *rava*
	51	Real world challenges encountered so far	Grader screens leaking	Motor related problem
	52	Solutions found to overcome the real world challenges encountered	Padding and tape on edges	Motor replaced
IV. Utilization of SMPU	53	Number of users in the last month - Living less than 5 kms away	11	37

IV. Utilization of SMPU...	54	Number of users in the last month - Living more than 5 kms away	6	59
	55	Little millet - quantity processed in the last month	200 Kg	520 Kg
	56	Foxtail millet - quantity processed in the last month	0	0
	57	Proso millet - quantity processed in the last month	0	0
	58	Processing purpose - For consumption by local families	0	520 Kg
	59	Processing purpose - For sale of SM rice - directly to customer	200 Kg	0
	60	Processing purpose - For sale of SM rice - to traders	0	0
	61	User experience testimonials - quantum of processed rice per one unit of grain processed	Below expectation	Meets expectation
	62	User experience testimonials - Share of broken grains in the output	Too high, but using for *rava*	Too high, but using for *rava*
	63	User experience testimonials - quantum of work to be done manually after getting the SM processed at the SMPU for making the output ready for cooking	Too much	Still quite a bit
	64	User experience testimonials - polish level	Unpolished	Ok
	65	User experience testimonials - cooking quality	Good	Good
	66	User experience testimonials - Usage of by products	For *rava* based preparations	For *rava* based preparations