


7. JAGGERY MACHINERY

i	Type of the Technology	:	Process and machine
	b) Technology developed	:	Crystal (<3.0mm) Jaggery Making Process and Crystal Jaggery Making Machine).
ii	Application/ Use	:	Crystal (<3.0mm) can be prepared by manually or by using the machine
iii	<p>Description of Technology : A Crystal (<3.0mm jaggery) making unit consists of hemispherical drum of stainless steel (for holding thick hot jaggery syrup) having 275 mm radius, 400 mm width and 800 mm length and is provided with perforated guard at the top having 475 mm width and 845 mm length for allowing natural cooling. The drum is provided with a circular opening of 114 mm diameter at the centre of bottom for discharge of crystal jaggery. An iron shaft (1300 mm long) is placed laterally in the drum leaving a gap of 100mm and fixed with bearings for easy rotation with the help of a handle. A total of 33 blades (each of 8 mm thick and 100mm long) arranged in 3 rows on the shaft in zigzag manner for facilitating scrapping of hot thick jaggery syrup into crystal/crystal form. Crystal jaggery making machine further modified by keeping rectangular projections (of 30 mm width and 32 mm length) with sharp edges at the end of the blades and were welded for easy shearing of jaggery into crystal form. This machine is superior in terms of saving time and drudgery.</p>		
iv	Input/raw material	:	Iron and Stainless steel for machine making Sugarcane juice for crystal jaggery
	a) Overall dimension	:	Outer length – 840mm, width – 470mm, radius 235mm, Stand length – 900mm, width, 600mm and height 550mm
	b) Weight	:	About 145 kgs -
	c) Prime mover	:	Lathe machine, Drilling machine, Welding machine and other accessories of workshop.
	d) Man power	:	4 No.
	e) Land	:	NA
	f) Investment	:	Rs. 30,000/-
v	Output capacity	:	25kg crystal jaggery/hour
vi	Unit cost (per machine)	:	Rs. 30,000/-
vii	Contact Address	:	PI, AICRP on PHT Regional Agricultural Research Station Anakapalle – 531 001 (Andhra Pradesh)

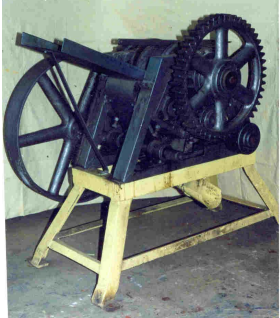


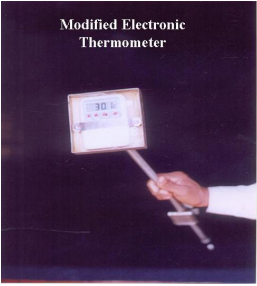
i	Name of the Technology	:	Mechanized Jaggery Granulator for production of free flowing jaggery granules.
ii	Application/ Use	:	Preparation of granular jaggery
iii	Description of Technology		<p>Scrapping of concentrated sticky mass into granules is being practiced manually in different countries including India. This process is tedious, labour intensive and not free from extraneous contamination. Development of a mechanized jaggery granulator for this sticky substance will reduce the cost of production and obtaining uniform size of granular jaggery, which could replace slow, unhygienic and labour intensive manual operation. First time, this was developed at this centre. Indian Patent on " Mechanized Jaggery Granulator" was filed in the name of "Acharya N.G.Ranga Agricultural University and Project Coordinator, AICRP on PHT" at Patent Office, Chennai through application No.1265/CHE/2013 dt.22-03-2013, which is under process.</p>
			
iv	Input/raw material	:	Sugarcane
	a. Overall dimension	:	1.0 m ×1.2 m
	b. Weight	:	850 kgs
	c. Prime mover	:	2.0 HP
	d. Man power	:	5 Persons
	e. Land	:	2.0 acres
	f. Investment	:	Total equipment cost: 16.0 Lakhs excluding land and buildings. The equipment includes crusher, juice collecting tank, juice clarifier, juice settling tank, pre heating pans, juice boiling pans, ladles, trays, hydraulic system for movement of boiling pan, mechanized jaggery granulator, hot air tray dryer, mechanical siever, packaging machine.
v	Output capacity	:	150 kg granular jaggery/batch
vi	Unit cost	:	Mechanized jaggery granulator unit cost: 3.1 lakhs
vii	Suitability for crop/ commodity	:	Suitable for production of granular jaggery
viii	Efficiency	:	80%
ix	Unit cost of operation	:	Rs.60.0 per kg
x	Contact Address	:	Dr.P.V.K.Jagannadha Rao, Principal Scientist (Ag.Engg.), Regional Agricultural Research Station, Anakapalli -531 001 (A.P.), Visakhapatnam dt. E-Mail : pvkjrao @rediffmail.com, pht.akp@gmail.com

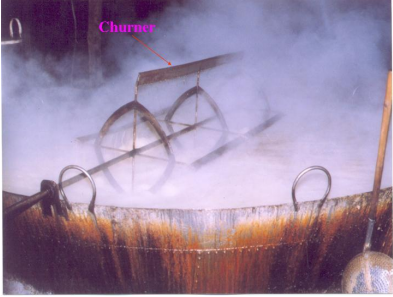
i	Name of the Technology	:	Steam boiling system using bagasse for the preparation of good quality jaggery.
ii	Application/ Use	:	The steam boiling system for the boiling of sugarcane juice during the preparation of jaggery, which reduces the boiling time by 20% and also produce export quality jaggery with good colour under hygienic conditions.
iii	<p>Description of Technology</p> <p>The preparation of jaggery involves: collection of juice by crushing canes, its filtration and concentration by open boiling, cooling of concentrated juice followed by moulding, drying and storage. The juice boiling is the main unit operation in preparation of solid, liquid and granular form of jaggery. Traditionally open pan boiling is being practiced by the jaggery producers which consume time as well as energy. Also the entire process is unhygienic as boiling of juice is carried out with direct burning of bagasse in open grate furnace. The combustion and heat utilization efficiency of commonly used furnace by the farmers is a low as 20% and consume high quantum of bagasse. Also, the quality of the jaggery is highly affected with smoke and contamination with ash particles, not suitable for export.</p> <p>The steam boiling system for the boiling of sugarcane juice during the preparation of jaggery was developed at AICRP on PHET, Regional Agricultural Research Station, Anakapalle consists of 500 kg juice capacity stainless steel (SS 304 grade) steam jacketed pan provided with glass wool insulation and tilt mechanism. The boiler and steam jacketed pan are connected through steam lines, used for the preparation of 80 kg jaggery per batch of 2.5 hrs. The whole system could be used for the production of 320.0 kg jaggery in a day and reduces the boiling time by 20% as compared to farmer's practice of traditional boiling (240 kg jaggery in a day). Also it produces export quality jaggery with golden yellow colour.</p>		
iv	Input/raw material		Sugarcane
	a. Overall dimension		Length: 12.0 m; Width: 2.0 m
	a. Weight		--
	b. Prime mover		Bagasse based furnace
	c. Man power		5 Persons
	d. Land		2.0 acres
	e. Investment		Rs.9,00,000-00 excluding land and buildings Building size: 12.2 m length and 6.2 m width
v	Output capacity		320 kg jaggery in a day
vi	Unit cost		Rs.9,00,000-00
vii	Suitability for crop/ commodity	:	Suitable for preparing good quality jaggery under hygienic conditions.
viii	Efficiency		60%
ix	Unit cost of operation		Rs.40-00 per kg.
x	Contact Address		Dr.P.V.K.Jagannadha Rao, Principal Scientist (Ag.Engg.),

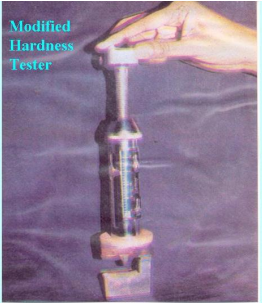


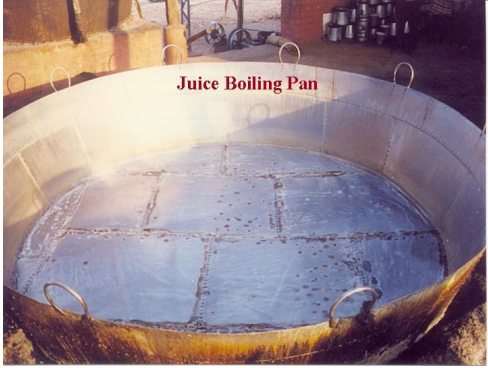
			Regional Agricultural Research Station, Anakapalli -531 001 (A.P.), Visakhapatnam dt. E-Mail : pvkjrao @rediffmail.com, pht.akp@gmail.com
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i.	Name of the Technology	:	Improved Four Roller Sugarcane Crusher
ii.	Application/ Use	:	To extract the juice by crushing sugarcane
iii.	Description of Technology:		
			<p>There are four rollers provided in this crusher compared to the three rollers in the conventional crushers. Through the shafts and gear wheels, power is transmitted to the rollers and extracts the juice by crushing the cane. About 60 – 70% of the available juice can be extracted from sugar cane. Thus 8-10% additional juice is recovered than the conventional crushers. The overall dimension of the unit is 1210 x 510 x 1100 mm.</p>
			
iv.	Input/raw material	:	Sugarcane
	f) Overall dimension	:	-
	g) Weight	:	-
	h) Prime mover	:	-
	i) Power	:	7.5 hp
	j) Man power	:	Two Persons
	k) Land	:	Nil
	f) Investment	:	Nil
v.	Output capacity	:	250 kg/h
vi.	Unit cost (per machine)	:	Rs. 50, 000/-
vii.	Suitability for crops/commodity	:	Sugarcane
viii.	Efficiency	:	60-70%
ix.	Unit cost of operation	:	Rs.25/h
x.	Patent obtained/applied	:	No
xi.	Commercialization status	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred		Farmer –cum-Processor/ Entrepreneur
	(b) Selected Addresses of Licensee /Manufacturer		M/s. Kesavan Industries, 87, Dharapuram Road, Udumalpet – 642 126, Tamil Nadu. Phone: 04252 – 223939 (Office/factory)
xii.	Contact Address	:	Professor and Head, Agricultural Machinery Research Centre, Tamil Nadu Agricultural University, Coimbatore – 641 003. Phone : 0422- 6611272 ; FAX : 0422-6611455 ; e-mail : processing@tnau.ac.in

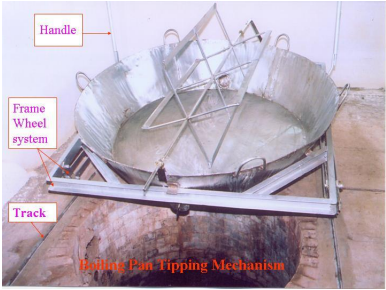
i.	Name of the Technology	:	Modified Electronic Thermometer
ii.	Application/ Use	:	Jaggery and liquid jaggery is prepared by the semi skilled / skilled labours on the basis of visual observations. Little error in judgment to remove boiling pan from furnace may lead to deterioration of quality of jaggery. Hence to indicate the striking point temperatures at liquid jaggery and jaggery stages modified electronic thermometer is useful. It would help to obviate the need of the skilled labour
iii.	Description of Technology :		<p>Digital display thermometer is provided with cable and probe for sensing and recording the temperature. The cable is passed through SS tube (11 mm OD, 1075 mm length) to which probe is fixed at one end by nylon bush. The thermometer fitted in SS casing is attached to the other end tube in inclined position. A provision has been made to clamp the thermometer to the sidewall of boiling pan. The probe is kept in juice sample in pan. The temperature (0-150°C) is read directly from the digital display screen of thermometer.</p> 
iv.	Input/raw material	:	Digital display thermometer, SS tube, nylon bush, probe
	a) Overall dimension	:	970 x 110 x 100 mm
	b) Weight	:	700 gm
	c) Prime mover/ Plant & Machinery	:	NA
	d) Man power	:	NIL
	e) Power	:	Electricity / battery
	f) Land	:	NA
	g) Investment	:	Rs. 3500/-
v.	Output capacity	:	NA
vi.	Unit cost (per machine)	:	Rs. 3500/-
vii.	Suitability for crops/commodity	:	Sugarcane juice
viii.	Efficiency	:	NA
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	Nil
xi.	Commercialization status	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	Farmer- cum processor
	(b) Selected Addresses of Licensee/Manufacturer	:	<ol style="list-style-type: none"> 1. Shri. Gopalrao Manku Patil At/post- Hirwade Khalsa Tal – Karveer Dist. Kolhapur (Cell : 9423040691) 2. Shri. Ramchandra Tukaram Budkar At/post – Shiroli (Pulachi), Tal- Hatkangle Dist- Kolhapur
xii	Contact address		PI, AICRP on PHT Regional Sugarcane & Jaggery Research Station, Opp. Market yard, Mahatma Phule Krishi Vidhyapeeth , Rahuri) Kolhapur-416005 (MS)

i.	Name of the Technology	:	Churner
ii.	Application/ Use	:	It is used during rigorous boiling of juice for Mechanical defrothing. It makes the operation smooth with minimum drudgery
iii.	Description of Technology : Churner is tetra- parallel-vane type and made up of stainless steel. It is light in weight. Its blades are fitted at spokes with specific angle of about 30 ⁰ on the main shaft which prohibits overflow of juice at the time of frothing. The unit is fitted on two ball bearing one each on two edges of the pan.		
iv.	Input/raw material	:	Stainless steel, Ball bearings
	Overall dimension	:	4572 x 1143 x 1143 mm
	Weight	:	25 Kg
	Prime mover/ Plant & Machinery	:	NA
	Man power	:	01 (man -h / batch)
	Power	:	Manual operated
	Land	:	
	Investment	:	Rs. 7000/-
v.	Output capacity (Churning)	:	20 rpm
vi.	Unit cost (per machine)	:	Rs. 7000/-
vii.	Suitability for crops/commodity	:	Sugarcane juice
viii.	Efficiency	:	NA
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	NIL
xi.	Commercialization status	:	Commercialized
xii.	No. of Licensees to whom the technology has been transferred	:	Farmer- cum processor
xiii.	Selected Addresses of Licensee or Manufacturer	:	Shri. Khanderao Ghadge At/post- Kadam wadi, Tal - Karveer , Dist. Kolhapur Shri. Shamrao Medhe At/post Bapat Camp, Tal- Karveer , Dist- Kolhapur
xiv.	Contact address		PI, AICRP on PHT, Regional Sugarcane & Jaggery Research Station, Opp. Market yard, Mahatma Phule Krishi Vidhyapeeth , Rahuri Kolhapur-416005 (MS)

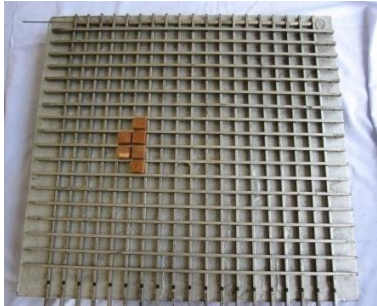
i.	Name of the Technology	:	Modified Hardness Tester
ii.	Application/ Use	:	Hardness tester is used for testing hardness of solid jaggery. It is useful in distinguishing the jaggery samples for storage, transport and various other purposes.
iii.	Description of Technology :		
	Hardness tester used for pharmaceutical purpose is modified with provision of special bracket at bottom. The jaggery sample of adequate size (approx 2.5 cm cube) is held inside the bracket and pressure is applied manually by tightening the knob till the rupture point is obtained. Hardness (kg /cm ²) readings are read on the dial marked by arrow.		
			
iv.	Input/raw material	:	-
	a) Overall dimension	:	295 x 45 x 45 mm
	b) Weight	:	1.0385 Kg
	c) Prime mover/ Plant & Machinery	:	NA
	d) Man power	:	01(man)
	e) Power	:	Manually operated
	f) Land	:	NA
	g) Investment	:	Rs. 1800/-
v.	Output capacity	:	1 jaggery cube/min.
vi.	Unit cost (per machine)	:	Rs. 1800/-
vii.	Suitability for crops/commodity	:	Jaggery
viii.	Efficiency	:	NA
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	Nil
xi.	Commercialization status	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	NIL
	(b) Selected Addresses of Licensee/Manufacturer and Contact addresses	:	Nil
xii	Contact address		PI, AICRP on PHT, Regional Sugarcane & Jaggery Research Station, Opp. Market yard, (Mahatma Phule Krishi Vidhyapeeth , Rahuri), Kolhapur-416005 (MS)


i.	Name of the Technology	:	Juice Boiling Pan
ii.	Application/ Use	:	It is used for concentration of sugarcane juice and preparation of quality liquid jaggery and jaggery. It is made up of stainless steel and prohibits release of iron in juice which imparts dark colour to jaggery.
iii.	Description of Technology : It is open type of boiling pan and trapezoidal in cross section. The top and bottom of the pan is circular with 3658 mm and 2820 mm diameters, respectively. The height of the pan is 686 mm. It has 8 rings fixed at equal distance on the top edge. The rings facilitate removal of boiling pan manually from the furnace. Sugarcane juice from 1000 to 1200 liters can be processed at a time per batch in this pan.		
iv.	Input/raw material	:	-
	a) Overall dimension	:	3685 x 3685 x 790 mm
	b) Weight	:	100 Kg
	c) Prime mover/ Plant & Machinery	:	NA
	d) Man power	:	NA
	e) Power	:	Bagasse / Agril. Waste for boiling juice
	f) Land	:	
	g) Investment	:	Rs. 1,00,000/-
v.	Output capacity	:	240 Kg jaggery per batch
vi.	Unit cost (per machine)	:	Rs. 1,00,000/-
vii.	Suitability for crops/commodity	:	Sugarcane juice
viii.	Efficiency	:	NA
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	Nil
xi.	Commercialization status	:	
	(a) No. of Licensees to whom the technology has been transferred	:	Farmer- cum processor
	(b) Selected Addresses of Licensee/Manufacturer	:	Shri. Khanderao Ghadge At/post- Kadam wadi ,Tal - Karveer , Dist. Kolhapur (MS)
xii	Contact address		PI, AICRP on PHT, Regional Sugarcane & Jaggery Research Station, Opp. Market yard, (Mahatma Phule Krishi Vidhyapeeth , Rahuri) Kolhapur-416005 (MS)


i.	Name of the Technology	:	Sugarcane Juice Collection and Settling Tank
ii.	Application/ Use	:	Tanks are useful for collection and settling of juice during jaggery processing. It facilitates collection of impurities at the bottom of the tank. Specially developed bottoms of tanks are helpful in easy and complete removal of juice impurities It is also helpful for fast cleaning of tank during batch processing.
iii.	Description of Technology :		
	<p>Juice collection and settling tanks are prepared from 18 gauge stainless steel. Juice collection tank is partly cylindrical and partly conical in shape while juice settling tank is cylindrical in shape. Both the tanks are provided with ball valves at bottom for quick discharge of the juice and/or impurities. To avoid mixing of outside dust and to maintain the hygiene the tanks are provided with lids.</p>		
iv.	Input/raw material	:	Stainless steel
	a) Overall dimension	:	Collection Tank – Dia. 1100 mm, Height 900 mm Settling Tank – Dia. 700 mm, Height 900 mm
	b) Weight	:	NA
	c) Prime mover/ Plant & Machinery	:	Electric motor
	d) Man power	:	NIL
	e) Power	:	0.5 hp ele. motor for juice pumping in overhead settling tank
	f) Land	:	NIL
	g) Investment	:	Rs.40,000/-
v.	Output capacity	:	500 kg juice storage
vi.	Unit cost (per machine)	:	Rs.40,000/-
vii.	Suitability for crops/commodity	:	Sugarcane juice
viii.	Efficiency	:	NA
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	NII
xi.	Commercialization status	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	Farmer- cum processor
	(b) Selected Addresses of Licensee/Manufacturer	:	Nil
xii	Contact address		PI, AICRP on PHT, Regional Sugarcane & Jaggery Research Station, Opp. Market yard, (Mahatma Phule Krishi Vidhyapeeth , Rahuri) Kolhapur-416005 (MS)


i.	Name of the Technology	:	Boiling Pan Tipping Mechanism
ii.	Application/ Use	:	It facilitates easy and smooth removal of boiling pan containing hot jaggery from the furnace. This mechanism also helps to save labour with minimization of risk and hazards during the tipping operation.
iii.	Description of Technology :		
	Tipping mechanism consists of frame - wheel - track arrangement to carry the boiling pan up to cooling pit. Lifting of pan and tilting of pan is carried out simultaneously. The collar-cap system is fitted at bottom of pan for removal of hot jaggery from pan into cooling pit.		
iv.	Input/raw material	:	-
	a) Overall dimension	:	1820 x 1820 x 150 mm
	b) Weight	:	NA
	c) Prime mover/ Plant & Machinery	:	NA
	d) Man power	:	Two persons during operation
	e) Power	:	Manual
	f) Land	:	NA
	g) Investment	:	Rs. 8,000/-
v.	Output capacity	:	NA
vi.	Unit cost (per machine)	:	Rs. 8,000/-
vii.	Suitability for crops/commodity	:	Jaggery
viii.	Efficiency	:	NA
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	Nil
xi.	Commercialization status	:	Ready for commercialization.
	(a) No. of Licensees to whom the technology has been transferred	:	Nil
	(b) Selected Addresses of Licensee/Manufacturer and Contact addresses	:	Nil
xii	Contact address		PI, AICRP on PHT, Regional Sugarcane & Jaggery Research Station, Opp. Market yard, (Mahatma Phule Krishi Vidhyapeeth , Rahuri) Kolhapur-416005 (MS)


i.	Name of the Technology	:	Jaggery Moulding Frame
ii.	Application/ Use	:	Production of cube shaped jaggery
iii.	Description of Technology: The equipment is made of mild steel flats. Six small grooves are cut in each flat. The flats are fitted in these grooves. Each flat is electroplated to make the surfaces smooth. At one end of the each flat, a small hole is made, in which a rod is inserted. Two flats are separated with a steel spacer. The fitted molding frame is kept on a wooden (wrapped with aluminum sheet). The equipment is easy to fit and dismantle.		
iv.	Input/raw material	:	Flats : 37 No.(19 No of 685mm x 25 mm x3 mm and 20 No of 710 mm,x25 mmx3mm), Aluminum sheet : (900 mm x 900 mm with 19 gauge thickness), Wooden platform: (900 mm x 900 mm x 25 mm) Steel spacer: 19 No of 3 mm length and 6 mm dia), steel rod :506mm length and 3 mm diameter
	a) Overall dimension		625x 675 mm
	b) Weight		17 Kg
	c) Prime mover/ Plant & Machinery	:	N.A.
	d) Man power		01 No..
	e) Land	:	N.A.
	f) Investment		Rs. 6000/-
v.	Output capacity	:	7 kg per batch
vi.	Unit cost (per machine)	:	Rs. 6000/-
vii.	Suitability for crops/commodity	:	Sugarcane/ jaggery
viii.	Efficiency	:	90 %
ix.	Unit cost of operation		Rs 1.50 /kg
x.	Patent obtained/applied	:	Not applied
xi.	Commercialization status	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	Enterprises
	(b) Selected Addresses of Licensee/Manufacturer	:	M/s Vishkarma Krishi Yantra, Kalli Bazar Kalli Bazar, Mohanlal Ganj, Lucknow.
xii	Contact addresses		Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP) Phone: 0522-2480726 Fax: 0522-2480748

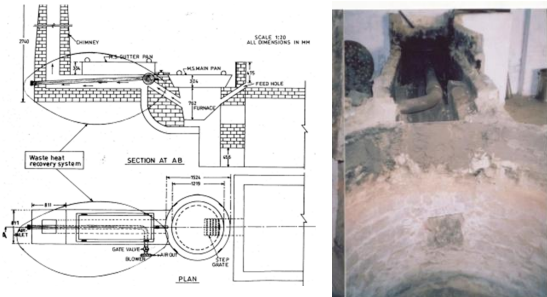
i.	Name of the Technology	:	Rectangular Shaped Jaggery Moulding Frame
ii.	Application/ Use	:	Production of rectangular shaped jaggery
iii.	Description of Technology: This equipment is made of 6x12x625 mm thick bright flat. 19 slots of 6 mm deep and 6 mm width each are cut in each flat of 625 mm length on one side. Similarly 18 slots of same size are cut in the bright flat of 625 mm length. These flats are fitted in these grooves. For making the surfaces smooth bright bar flats are electroplated. The steel spacer is provided to separate these two flats. Thus arranged /tightened rectangular frame is then kept on the aluminium wrapped wooden platform. The fitting and dismantling of this frame is quite easy.		
iv.	Input/raw material	:	The 19 no. of bright flats having size of 685mm x 25 mm x 6 mm and 18 No of 625 mm,x25 mmx6 mm), Aluminum sheet : (900 mm x 900 mm with 19 gauge thickness), Wooden platform: (900 mm x 900 mm x 25 mm) Steel spacer: 19 No of 3 mm length and 6 mm dia), steel rod :506mm length and 3 mm diameter
	a) Overall dimension		625 x625 mm
	b) Weight		25 kg
	c) Prime mover/ Plant & Machinery	:	N.A.
	d) Man power		01 No.
	e) Land	:	N.A.
	f) Investment		Rs. 4000/-
v.	Output capacity		3.5 kg/batch
vi.	Unit cost (per machine)		Rs.4000
vii.	Suitability for crops/commodity	:	Sugarcane/ jaggery
viii.	Efficiency		95%
ix.	Unit cost of operation		Rs 2 / kg
x.	Patent obtained/applied	:	Not applied
xi.	Commercialization status	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	--
	(b) Selected Addresses of Licensee/Manufacturer	:	Nil
xii.	Contact addresses	:	Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP). Phone: 0522-2480726 Fax: 0522-2480748 email:iisrko@sancharnet.in


i.	Name of the Technology	: Drying-cum-Storage Bin
ii.	Application/ Use	: Drying and storage of jaggery
iii.	Description of Technology:	
	<p>It is used for drying cum storage of jaggery for a family of six members for one year. It works on the principle of natural drying/natural draft. It is made of a circular GI sheet of 20 gauge. Towards bottom side, four holes of 10 mm diameter are made. These holes are open during summer and closed during monsoon. For loading the jaggery, a lid is provided on top. On bottom, a circular perforated plate having 10 mm diameter holes rests on a wooden cross.</p>	
		
iv.	Input/raw material	: G.I. sheet: 2100 mm x 900mm, wooden plank (2No. of 600 mm x250mm x25 mm)
	a) Overall dimension	: height 770 mm and diameter 540mm
	b) Weight	: 25 kg
	c) Prime mover/ Plant & Machinery	: N.A.
	d) Man power	: 02 Man
	e) Land	: N.A.
	f) Investment	: Rs 2500
v.	Output capacity	: 100 kg per batch
vi.	Unit cost (per machine)	: Rs 2500/-
vii.	Suitability for crops/commodity	: Jaggery
viii.	Efficiency	: 90%
ix.	Unit cost of operation	: NA
x.	Patent obtained/applied	: Nil
xi.	Commercialization status	: Commercialized
	(a) No. of Licensees to whom the technology has been transferred	: M/s Vishkarma Krishi Yantra Kalli Bazar, Mohanlal Ganj, Lucknow
	(b) Selected Addresses of Licensee/Manufacturer	: M/s Vishkarma Krishi Yantra Kalli Bazar, Mohanlal Ganj, Lucknow
xii.	Contact addresses	: Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP). Phone: 0522-2480726 Fax: 0522-2480748 email: iisrko@sancharnet.in

i.	Name of the Technology	:	IISR Two Pan Furnace with Forced Draft System
ii.	Application/ Use	:	Boiling and concentration of sugarcane juice
iii.	Description of Technology: It is two pan furnace; one for boiling and other for preheating of juice. Main parts of the furnace are; pans, combustion chamber, flue passage and chimney. The pans are made of mild steel sheet whereas other components are made of masonry structure. The bagasse is used as fuel. For transferring the preheating juice from preheating pan to boiling pan, gate valve is fitted. <div data-bbox="894 506 1360 821" style="float: right; text-align: center;">  </div>		
iv.	Input/raw material	:	M.S. sheet (10 mm thick 8' x 4' x 2 No) Flats 35 x 35 x 5 mm) size 30 ' length, Wooden planks (150x1000x50 mm size – 10 Nos.) and blower
	a) Overall dimension	:	2x5 m
	b) Weight	:	N.A.
	c) Prime mover/ Plant & Machinery	:	N.A.
	d) Man power		04
	e) Power	:	Bagasse fed
	f) Land	:	10 m ²
	g) Investment	:	Rs 50000
	v. Output capacity		115 kg juice/h and 21 kg jiggery/ h
	vi. Unit cost (per machine)	:	Rs. 50000/-
	vii. Suitability for crops/commodity	:	sugarcane juice
	viii. Efficiency	:	32 %
	ix. Unit cost of operation	:	Rs 20/ kg
	x. Patent obtained/applied	:	Not applied
	Commercialization status	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	M/S Sun Light Foundry,Barabanki
	(b) Selected Addresses of Licensee/Manufacturer	:	M/S Sun Light Foundry,Barabanki
xi.	Contact addresses	:	Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP). Phone: 0522-2480726 Fax: 0522-2480748 email:iisrlko@sancharnet.in


i.	Name of the Technology	:	Improved Triple Pan Furnace
ii.	Application/ Use	:	Boiling and concentration of sugarcane juice
iii.	Description of Technology:		
	It is three pan furnace; one for boiling and other two are for preheating the juice. The pre-heated juice is transferred to boiling pan by gravity drop system.		
iv.	Input/raw material	:	M.S. sheet , Mild steel flats, Wooden planks
	a) Overall dimension	:	2x6 m
	b) Weight	:	NA
	c) Prime mover/ Plant & Machinery	:	NA
	d) Man power	:	04 no.
	e) Power	:	Bagasse fed
	f) Land	:	12 m ²
	g) Investment	:	Rs. 65000
v.	Output capacity	:	120 kg juice per hour 25 kg/hour jaggery
vi.	Unit cost (per machine)	:	Rs. 65000/-
vii.	Suitability for crops/commodity	:	sugarcane juice
viii.	Efficiency	:	34%
ix.	Unit cost of operation	:	Rs18 /kg
x.	Patent obtained/applied	:	Not applied
xi.	Commercialization status	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	M/S Sunlight Foundry,Barabanki
	(b) Selected Addresses of Licensee/Manufacturer	:	M/S Sunlight Foundry,Barabanki
xii.	Contact addresses	:	Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP). Phone: 0522-2480726 Fax: 0522-2480748 email:iisrlko@sancharnet.in

i.	Name of the Technology	:	Modified juice Heating /Boiling/ Concentrating Pans
ii.	Application/ Use	:	Heating/boiling and concentration of sugarcane juice
iii.	Description of Technology:		
	<p>Fins (40 x 5 mm at 60 mm spacing) have been provided to the bottom of main and gutter pan of IISR 2-pan furnace for increasing area of heat receiving surface. With fins more heat is transferred to the juice hence the processing time of juice is reduced. This results in saving of fuel and time, and increase in jaggery productivity.</p>		
iv.	Input/raw material	:	Mild steel sheet and flats, m.s. bar
	a) Overall dimension	:	<i>Circular main pan:</i> Dia.: top 1555 mm, bottom 1270 mm, Height 304 mm <i>Rectangular gutter pan:</i> Length: 1220 mm, Width: 660 mm, Height: 304 mm
	b) Weight	:	150 kg
	c) Prime mover/ Plant & Machinery	:	N.A.
	d) Man power	:	02
	e) Power	:	Manual
	f) Land	:	2x5 m
	g) Investment	:	
v.	Output capacity		120 kg juice/h: 22 kg jaggery/h
vi.	Unit cost (per machine)		Rs 20000
vii.	Suitability for crops/commodity	:	Sugarcane Juice
viii.	Efficiency		34%
ix.	Unit cost of operation		Rs 18/kg
x.	Patent obtained/applied	:	Patent application No. 3457/DEL/2005 dated 23.12.2005
xi.	Commercialization status	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	-
	(b) Selected Addresses of Licensee/Manufacturer	:	-
xii.	Contact addresses	:	Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP). Phone: 0522-2480726 Fax: 0522-2480748 email:iisrko@sancharnet.in


i.	Name of the Technology	:	Waste Heat Recovery System for Open Pan Jaggery Furnace
ii.	Application/ Use	:	Recovery of waste heat for other useful purposes
iii.	Description of Technology:		
	<p>A counter-current type of heat exchanger has been installed in the flue gas channel of open pan jaggery furnace for heating of fresh air drawn through this system with the help of a blower. The heated air can be used for drying of jaggery/bagasse or space conditioning.</p>		
iv.	Input/raw material	:	G.I. pipe, bend and sockets, gate valve, air blower with regulator
	a) Overall dimension	:	2.4x2 m
	b) Weight	:	50 kg
	c) Prime mover/ Plant & Machinery	:	0.20 electric motor kW
	d) Man power	:	01 man
	e) Power	:	Electricity for running the blower
	f) Land	:	NA
	g) Investment	:	Rs. 5000
v.	Output capacity	:	30°C higher to input
vi.	Unit cost (per machine)	:	Rs. 5000/-
vii.	Suitability for crops/commodity	:	sugarcane juice
viii.	Efficiency	:	85%
ix.	Unit cost of operation	:	NA
x.	Patent obtained/applied	:	-
xi.	Commercialization status	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	-
	(b) Selected Addresses of Licensee/Manufacturer and Contact addresses	:	-
xii.	Contact addresses	:	Director or Research Engineer Indian Institute of Sugarcane Research, Lucknow (UP). Phone: 0522-2480726 Fax: 0522-2480748 email:iisrko@sancharnet.in

i	Name of the Technology	:	Sugarcane Peeler
ii	Application/ Use	:	Reduction in human drudgery during cane cleaning
iii	Description of Technology :		
	<p>The peeling unit consists of four peeling blades attached inside a square frame of 15 cm. The blades are attached at uniform spacing through the slots in the inner plate and inter-connected with four springs to provide uniform tension. The other ends of the blades are hinged to outer plate of the frame. The peeling blades are tapered and are 15cm long having 22-25 teeth. The peeling unit is mounted on a hollow shaft with bearings to facilitate rotation. The whole unit is mounted on a rectangular frame. The unit is operated by electric motor(1 h.p.) through belt and pulley arrangement.</p>		
iv	Input/raw material	:	Sugarcane
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	1 h.p.
	e. Man power	:	-
	f. Land	:	--
	g. Investment	:	-
v	Output capacity	:	100 kg sugarcane/h
vi	Unit cost (per machine)	:	Rs. 15,000
vii	Suitability for crop/ commodity	:	Sugarcane
viii	Efficiency	:	-
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Ready for commercialization
	a) No. of Licensees	:	-
	b) Addresses of Licensees or Manufacturer	:	-
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow, Phone: 0522-2480726, Fax: 0522-2480748 Email: iisrlko@sancharnet.in


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i	Name of the Technology	:	IISR 3-Roller Horizontal Power Driven Crusher
ii	Application/ Use	:	Higher jaggery recovery
iii	Description of Technology :		
	<p>The king roller of crusher has been provided with 25 mm thick and 35 mm deep collar for proper feeding of cane.</p>		
			
iv	Input/raw material	:	Jaggery
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	10 h.p.
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	8-10 quintal per hour
vi	Unit cost (per machine)	:	Rs. 45000
vii	Suitability for crop/ commodity	:	Jaggery
viii	Efficiency	:	65%
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Commercialized
	a) No. of Licensees	:	1
	b) Addresses of Licensees or Manufacturer	:	Sunlight Foundry, Lucknow Road, Barabanki
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow, Phone: 0522-2480726, Fax: 0522-2480748 Email: iisrko@sancharnet.in


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i	Name of the Technology	:	Small Capacity Cane Crusher
ii	Application/ Use	:	Fresh juice availability under hygienic conditions at low cost
iii	Description of Technology : A compact small capacity sugarcane crushing unit consisting of one set of three horizontal rollers (king, feed and extraction rollers), a 1 h.p.electric motor, speed reduction gear box and a chain sprocket arrangement to get 15 rpm roller speed, sugarcane entry and bagasse exit port, rectangular framing plate and a stand. It performs smoothly without making any noise and has single and double pass capacity of 60 and 30 kg/h with 30% and 60% juice recovery respectively.		
iv	Input/raw material	:	Sugarcane
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	1 h.p.
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	Single pass : 60 kg/h Double pass : 30 kg/h
vi	Unit cost (per machine)	:	Rs. 30,000
vii	Suitability for crop/ commodity	:	Sugarcane
viii	Efficiency	:	Single pass : 30% Double pass : 60%
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Commercialized
	a) No. of Licensees	:	1
	b) Addresses of Licensees or Manufacturer	:	M/S Prabh Enterprizes, Subhash Nagar, Alambagh, Lucknow
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow Phone:0522-2480726,Fax:0522-2480748 Email: iisrko@sancharnet.in


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i	Name of the Technology	:	Mechanical Cane Juice Filtration Unit
ii	Application/ Use	:	Reduction in impurities results in better quality jaggery, which has more demand
iii	Description of Technology :		<p>The filtration unit consists of a prefilter and four synthetic filters. Each filter is made of plastic cartridge. Inside cartridge, synthetic candle filter media are kept. The diameter and length of the candle is 70 mm and 260 mm respectively. The raw juice is passed to the unit from one end and filtered juice comes out through other end. A small submersible pump of capacity 800 l/h is used for pumping the juice. The system is operated with an electric motor of 12 watt.</p> 
iv	Input/raw material	:	Jaggery
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power	:	12 watt
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	300 l/h of filtered juice
vi	Unit cost (per machine)	:	Rs. 7000
vii	Suitability for crop/ commodity	:	Jaggery
viii	Efficiency	:	75% of insoluble impurities present in the cane juice are filtered.
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Ready for commercialization
	a) No. of Licensees	:	-
	b) Addresses of Licensees or Manufacturer	:	-
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow Phone:0522-2480726,Fax:0522-2480748 Email: iisrko@sancharnet.in


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i	Name of the Technology	:	Boiling Juice Churning Device
ii	Application/ Use	:	Uniform heating and mixing of juice for better quality jaggery
iii	Description of Technology :		
	The device is used for mixing of hot juice during the boiling operation. It is operated when juice boils in the open pan. It is operated at the speed of 11-15 rpm. Each set of rotor lifted the juice from the boiling pan and poured it back to the boiling pan during the rotary motion of the rotor. It is operated by a manual labourer.		
iv	Input/raw material	:	Jaggery
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	1
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	20 l/h
vi	Unit cost (per machine)	:	Rs. 3000
vii	Suitability for crop/ commodity	:	Jaggery
viii	Efficiency	:	-
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Ready for commercialization
	a) No. of Licensees	:	1
	b) Addresses of Licensees or Manufacturer	:	-
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow Phone:0522-2480726,Fax:0522-2480748 Email: iisrko@sancharnet.in

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i	Name of the Technology	:	Scum Settling Tank
ii	Application/ Use	:	Juice loss reduction
iii	Description of Technology :		
	<p>The scum, which is removed in the process of juice clarification, contains about 54 per cent juice by volume. This juice is normally lost. Scum settling tank helps in recovery of this trapped juice. For this, scum is settled for some time in the settling tank and then the tap is opened. Clear juice comes out. Recovery of this juice helps in reduction of losses in jaggery making.</p>		
iv	Input/raw material	:	Jaggery
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	20 litre of scum per batch
vi	Unit cost (per machine)	:	Rs. 300
vii	Suitability for crop/ commodity	:	Jaggery
viii	Efficiency	:	-
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Commercialized
	a) No. of Licensees	:	1
	b) Addresses of Licensees or Manufacturer	:	Vindhyavasini Traders, Lucknow
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow Phone:0522-2480726,Fax:0522-2480748 Email: iisrko@sancharnet.in

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i	Name of the Technology	:	Mechanical Jaggery Dryer
ii	Application/ Use	:	Improved quality of dried jaggery helps producer/farmer to earn more income
iii	Description of Technology : The dryer consists of an air blower for supply of forced air, a heating device for heating of supplied air and a drying chamber for housing of jaggery to be dried. A thermostat is provided to regulate the temperature of supplied air. Thermo-hygrometers are provided for recording temperature and relative humidity of the air entering into and leaving from the drying chamber. The capacity of dryer is 100kg/bath.		
iv	Input/raw material	:	Jaggery
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	100kg/batch
vi	Unit cost (per machine)	:	40,000 cost of dryer and 1.85 per kg drying cost of jaggery
vii	Suitability for crop/ commodity	:	Jaggery
viii	Efficiency	:	-
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Ready for commercialization
	a) No. of Licensees	:	-
	b) Addresses of Licensees or Manufacturer	:	-
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow Phone:0522-2480726,Fax:0522-2480748 Email: iisrko@sancharnet.in

i	Name of the Technology	:	Solar Dryer for Jaggery
ii	Application/ Use	:	Facilitates jaggery packaging and elongates its' shelf life.
iii	Description of Technology :		<p>Solar drier consists of solar collecting device, drying chamber, plenum inlet, chimney with aspirator and metallic stand. It has eight wooden trays each having capacity of holding 12.4 kg of jaggery. The The dryer works on the principle of faster low grade thermal drying with the help of solar energy and natural draft of the air flow.</p> 
iv	Input/raw material	:	Jaggery
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	Output capacity	:	100 kg per batch
vi	Unit cost (per machine)	:	Rs. 30,000
vii	Suitability for crop/ commodity	:	Jaggery
viii	Efficiency	:	-
ix	Unit cost of operation	:	-
x	Patent obtained/applied	:	-
xi	Commercialization status	:	Ready for commercialization
	a) No. of Licensees	:	-
	b) Addresses of Licensees or Manufacturer	:	-
xii	Contact Address	:	Director, Indian Institute of Sugarcane Research, Raebareli Road, Lucknow Phone:0522-2480726,Fax:0522-2480748 Email: iisrlko@sancharnet.in

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i.	Name of the Technology	:	Drying-cum Storage Jaggery Bin
ii.	Application/ Use	:	Storage of jaggery to retain its physical and chemical characteristics
iii.	Description of Technology : Bin is made of GI Sheet. It is rectangular in shape, having four compartments of equal size. Each compartment has two holes at the bottom for entry of air. A thick wire mesh is placed at the bottom of each compartment and jaggery is stored above the mesh. There is a chimney with a lid on the top of each compartment for passage of air. During summer season the stored jaggery dries naturally, due to aeration process inside the bin and its moisture content decreases up to 6-7% from its initial moisture content 13-14%. Before rainy season the lid and holes of the bin are closed tightly and the jaggery retains its physical and chemical characteristics unchanged during storage.		
iv.	Input/raw material	:	GI sheet, wire mesh, chimney with a lid
	a) Overall dimension	:	L×W×H (74'×61'×67').
	b) Weight	:	Information not available
	c) Prime mover	:	Not applicable
	d) Power	:	Not applicable
	e) Man power	:	One
	f) Land	:	100' ×100'
	f) Investment	:	Rs. 2500/-
v.	Output capacity	:	175 kg
vi.	Unit cost (per machine)	:	Rs. 2500/-
vii.	Suitability for crops/commodity	:	Jaggery
viii.	Efficiency	:	Good
ix.	Unit cost of operation	:	Not applicable
x.	Patent obtained/applied	:	Not applied
	Commercialization status	:	
	(a) No. of Licensees to whom the technology has been transferred	:	Nil
	(b) Selected Addresses of Licensee /Manufacturer	:	UP Small machinery corporation Near Kashipur Road, Gandhi Colony, Rudrapur
xi.	Contact Address	:	Head, Department of Process and Food Engg, College of Tech., G. B. Pant University of Agriculture & Tech., PANTNAGAR - 263 145 (Uttaranchal)

