Appropriate technologies

Facilitation & transfer to AARDO member countries

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Outline

- PSA office Initiatives
- RuTAG technologies
- AARDO and member Countries
- Transfer of technologies
- Brief on Appropriate Technologies
- Way forward

Office of PSA

PSA's Office was set-up in November,1999

Primarily to evolve Strategies to strengthen S&T infrastructure, economic& social sector, Catalyse multi-disciplinary projects networking institution enhancing national competitiveness; social impact etc.

Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC) Empowered Technology Group (ETG) Both Chaired by PSA

Helps in assessing the status in specific science and technology domains to make futuristic roadmap Initiated . Also determining direction and trajectory of Government's R&D and Technology Development Programmes, Co-ordinates with Government departments, institutions and industry.

Few Initiatives –

Nine National missions, AGNii- Accelerating Growth of New India's Innovation. RuTAG-Rural Technology Action Group S& T Institutional clusters

Rural technology action group -RuTAG

RuTAG is a synergizing and catalyzing mechanism, not a major funding mechanism supporting technology interventions that

-Address different occupational groups,
-Reduce the drudgery & add value to their products & services

The intervention is essentially demand-driven, bridging technology gaps, training, demonstration and any other innovative approach.

- ✓**Field tested Innovations done by RuTAG centres are**
- ✓**Addressing problems identified by local level**
- ✓**Well accepted at rural level**
- ✓**Impact seen as –*better product output, ease of operation, social change etc.***

Till date developed more than 50 field tested technologies to rural people.

RuTAG

- Non-farm sector preferred
- Skill up-gradation through specialized training
- One- off intervention in some cases
- Modification in the existing technology
- Innovation
- Training NGO representatives in

RuTAG CENTRES at 7 IITs

Madras, Guwahati, Kharagpur

Delhi, Roorkee, Bombay, Kanpur

RuTAG - Appropriate Technologies

- Suitable Techniques/Technologies/methods –could be easily customized to the requirement
- Help in better operations, getting quality product, managing the produce
- Adaption- Easy/maintenance
- Locally manufactured- May help strengthening local, community, cluster national level
- Impact- Ecology/Environment/National
- **Basic Concept-Traditional/Evolved/Integrated R&D**

STINER exhibition at Aizawl

RuTAG Technologies-2

Related to Artisan/Cluster & other Technologies:

Improved material for Horse Shoe making, Machines- for -Coir Rope, Jute Rope- 2 models, Door Mat (Papose) Making, Felt making, Coir Ratt, Potter's wheel- 3 models, Foot-driven-bicycle/sewing machine, Device for Making Tulsi Mala Beads, Furnace for Bangle Making, Motorized Sabai Grass Rope Making Machine, Motorized Sisal Fiber Extractor, Value addition to bamboo through charring.

Related to Textile Sector (Cotton/Silk/wool):

Cotton- Foot-driven Amber Charkha, Pedal Loom, Silk- Motorized Muga re-reeling Machine, Eri Cocoon Opener, Power loom for Weaving of Muga Silk Fabrics, Accessory machines for Handloom and Power loom, Hank to Bobbin Winding Machine, Pirn Winding machine, Sectional Warping Machine, Wool- Modified Bageshwari Wool Charkha.

Related to Energy Sector:

Modified Pump used as Turbine for Pico hydro.

RuTAG Technologies -3

Related to Agriculture Sector:

- Improved Bullock Driven Tractor,
- Animal Driven Gear Box for Multiple Rural Applications,
- Low Cost Ground Water Level Measuring Device,
- Improved human operated Treadle Pump,
- Multi nutrient compressed feed blocks,
- Paddy thresher

Other Technologies:

Modified Bicycle for post harvest agriculture produce, Sanitary Napkin, Betel nut cutter, Chaff cutting.

RT Link - http://psa.gov.in/sites/default/files/pdf/rutagbooklet.pdf

RuTAG Compendium

A Compendium on Rural Technology Action Group (RuTAG)/- http://rutag.iitd.ac.in/rutag/?q=rutag-compendium

PSA office -AARDO Initiative-

Technology facilitation to the Member countries

AARDO through its diverse activities and programmes, Efforting to provides ample opportunities to the officials/experts from member countries exploring promotion of rural and agriculture development..

- ✓ **Facilitates exchange of ideas and experiences among the member countries and to identify new areas of collaboration;**
- ✓ **Strengthen the institutional capacity of Afro-Asian member countries in sustainable agriculture and rural development**
- ✓ **Supports technical/financial pilot projects for experimentation and replication;**

Rich in traditional knowledge, natural resources, African-Asian region have significantly improved the quality, knowledge, skills and competencies of their human resources.

Technologies can help to address some of the challenges- Offer better livelihood/ value added products, natural resource management

Happy to share that dialogue has already started and we have got very positive response , identified few technologies for transfer.

Facilitation and TRANSFER-1

Making Technology Available to the member countries as per demand

- Cooperation and collaboration- Facilitation Channel Mechanismat the regional level -AARDO
- Technology transfer- With Handholding , Training upto complete social diffusion,
- Suitable Business Avenues

Technology Transfer –

a) Identifying the demand, Selection of the appropriate technologies, Considering Existing support system, Stake holders as per the member country etc. Zeroing on the no. of devices/ preferable transfer modalities

Facilitation and TRANSFER-2

b) Transfer Technical handholding and implementing at ground level and making community happy.

c) Sustainable Technology outreach to rural areas considering :-

- ✓ Traditional knowledge, Socio-economic structure
- ✓ Policy support , Stake holder capacity,
- ✓ Govt. Initiatives, Funding, Entrepreneurs/Manufacturing Training etc.

Empower Rural areas solving local demands through Local to Local, Accessible , Affordable technology solutions

Selected Technologies

Considering the technology potential in rural areas strengthening Agriculture sector following technologies are prioritized

Technologies

1. **Improved Bullock Driven Tractor**
2. **Animal Driven Gear Box Multiple Application**
3. **Low Cost Ground Water Level Measuring Device**
4. **Treadle Pump**
5. **Paddy thresher**
6. **Oil expeller**
7. ***Soil Organic carbon detection Kit- BARC***
8. ***Sanitary Napkins Reusable Bio-compostable***

Agriculture Sector

Technologies-6 nos.

1. Treadle Pump
2. Low Cost Ground Water Level Measuring Device
3. Bullock Driven Tractor
4. Paddy thresher
5. Animal Driven Gear Box
6. Oil expeller

1. Ergonomically Designed Treadle Pump

(Collaboration with Gramodaya Rachnatmak Vikas Samiti, Deoria. U.P.)

Background:

- Treadle pump is a mechanical device which uses human power to draw water from the ground.
- It is a twin-cylinder reciprocating water pump presently being used by small/marginal farmers in various parts of eastern U.P, Bihar, Orissa and other places for irrigation purposes.
- These are particularly popular in areas where water level is not too low (around 10 m or less).

Impact of the Improved Technology

- A total of about 19 pumps were sold (8 by vendors and 11 by RuTAG IIT Delhi)
- Two treadle pumps were sold through Innovative Products Delivery of FITT, IIT Delhi
- Useful for farmers with small land holdings
- Treadle pumps are installed in Orissa, Uttar Pradesh, Bihar, Madhya Pradesh, Karnataka, and West Bengal successfully

Feedback from the user

Very useful device for pumping water from ponds without electricity

-Residents, Ambalipura, Banglore

1- Ergonomically Designed Treadle Pump….

Salient Features of Ergonomically Deigned Treadle Pump

- Portable
- Easy to assemble and operate
- Made using hand pumps and plumbing parts
- Save electricity and environment friendly
- Pedals can be adjusted according to the weight of the operator
- Discharge rate: 3500-4000 litre per hour
- Projected life span: 10 to 15 years

Dissemination Potential

Irrigation, lifting water from wells, bore holes, and ponds

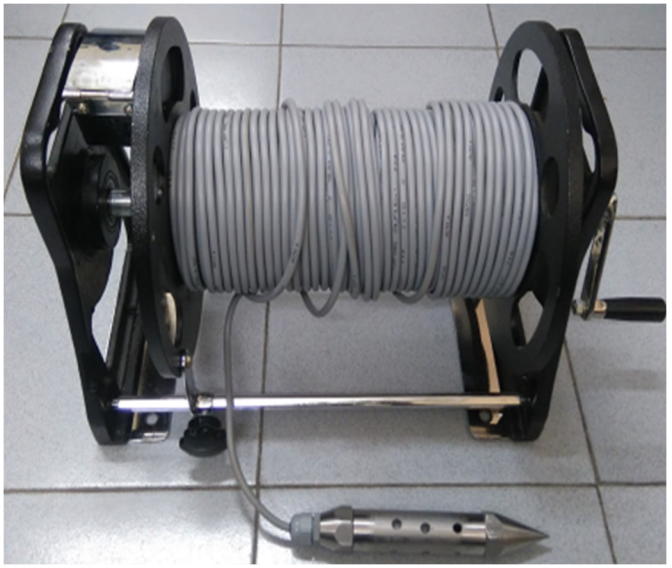
Tentative cost of the prototype: Rs. 10k-15k which excludes freight, installation, GST and other levies

2.Ground Water Level Measuring Device

(Collaboration with Ram Krishna Jaidayal Dalmia Seva Sansthan, Chirawa, Rajasthan)

Background:

- This device is used to measure ground water table in the monitoring well.
- It is an electric switch-type device, with electrodes having open ends attached to a wire, which is further connected to a battery beeper and LED.
- When electrodes encounter conductive fluid, the circuit is completed and buzzing starts and depth is measured from the marked cable.



Impact of the Improved Technology

- Nearly 3 devices have been sold/distributed (by RuTAG IIT Delhi)
- Used by Central Ground Water Board, Ministry of Water Resources, Govt. of India
- A new company at IIT Delhi extended the product to a contactless device, http://www.aquasense.tech/#products

Feedback from the user

Easy and accurate ground water level measurement

-Ram Krishna Jaidayal Dalmia Seva Sansthan, Chirawa, Rajasthan

2. Ground Water Level Measuring Device….

Salient Features of Ground Water Measuring Device (GWMD)

- Portable
- Complies with IS 15896:2011
- Probe is an assemblage of plumb bob, perforated tubular body, high pressure cord holding gland, a sensor, and stainless steel material
- High operational stability
- Accurate measurement

Dissemination Potential

Estimation of ground water resources, In-situ water measurement for various sectors like irrigation, domestic and industries

Tentative cost of the prototype: Rs. 10,000 which excludes freight, installation, GST and other levies

3. Ergonomically Designed Bullock Driven Tractor (BDT)

(Collaboration with Social Centre for Rural Initiative and Advancement (SCRIA), Rewari, Haryana)

Background:

- Bullock Driven Tractors use draught power of bullocks, and are suitable to the needs of the farmers with small land holdings.
- BDTs are capable of performing multiple tasks of agricultural operations such as ploughing, harrowing, sowing, planting, and harvesting.

Impact of the Improved Technology

- Nearly 3 BDTs have been distributed (by RuTAG IIT Delhi)
- One BDT was sold through Innovative Products Delivery of FITT, IIT Delhi
- Most suitable to farmers of small land holdings
- Relief to farmers from increasing price of the fossil fuel and electricity, and environment friendly
- Efficient harnessing of animal power
- Currently, it is being used in M. P. and Haryana

3. Ergonomically Designed Bullock Driven Tractor….

Salient Features of Ergonomically Designed Bullock Driven Tractor (BDT)

- Steel rope and winch mechanism for lifting attachments such as harrow, cultivator, seed drill, etc.
- Better sitting posture
- Easier in turning the tractor
- Provides comfort to the tiller

Dissemination Potential

Draught animal power for agricultural operations viz. ploughing, sowing, harrowing, planting and harvesting

Tentative cost of the prototype: Rs. 25k-30k which excludes freight, installation, GST and other levies

4. **Paddy Thresher - Specifications**

Threshing is the process of separating the grains from the paddy stalks

Labour supply-demand gap for paddy threshing Use of large scale threshers is expensive and result in more grain wastage for marginal and small scale farmers

Device

- Type: Feed-in threshing machine,
- Capacity : 150-200 kg output/hour
- Power : 1000 rpm
- Threshing efficiency : 95-98%
- Thresher weight: ~ 200 kg
- Paddy varieties tested: Poongar, Kichili Samba, Jeeraga Samba, Vaikunta

Key Competitive Advantages

It can thresh paddy without chopping the straw of the moist crop

The straw, chaff, grains are separated and thrown separately thus reducing drudgery. Device is easy to install and maintain.It does not chop the straw and hence we get it in full length. Portable and easy maintenance

4. Field trials were done at small field in Zamin Endathur (Madurantakam) Tamilnadu on 29-1-2020

Observations:

Power Source	: Tractor PTO (VST Mitsubishi Sakthi VT 224-1D)
Duration of Trials	: 90 minutes
Thresher cylinder Speed	: 950 rpm
Paddy variety used	: Jeeraga Samba
Length of Paddy Stalks	: 1.5 ft (approx)
Quantity used	: Produce from 5 cents of land(approx)
Time of Harvest	: 2 days before trials
Thresher efficiency	: 98% approx
Productivity	: 200-250kg grain per hour.

5. Animal Driven Gear Box (ADGB) for Multiple Rural Applications

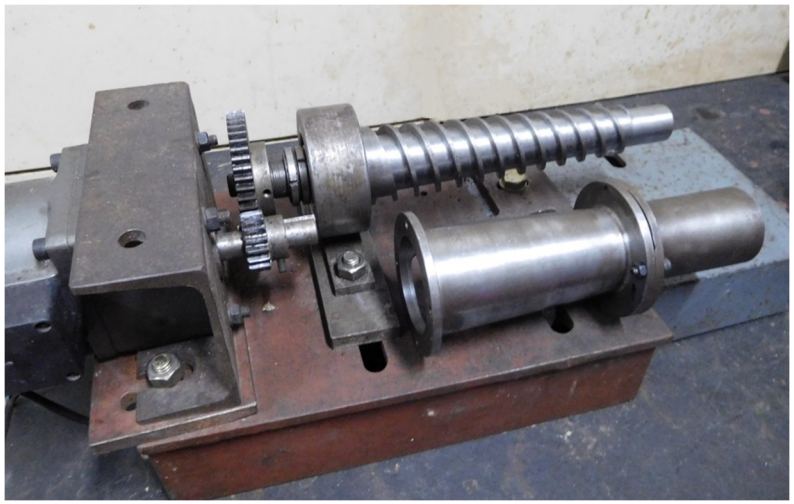
Salient Features and Advantages

•Redesigned gearbox is lighter in weight & smaller in size.
•Simplified designs with reduced cost and user-friendliness.
•Gearbox design is standardized.
•Power transmission is redesigned & standardized to couple with ADGB.
•Lever support is provided to reduce load on bullocks.
•Standard gear box & power transmission can be used to run multiple applications such as Screw Pump, Chaff-Cutter, Atta-Chakki, and Paddy Thresher.

6.Fabricated Oil Expeller

6. Fabricated Oil Expeller

1. Compact Cold press Oil expeller giving about 28% oil has been fabricated
2. Cost Rs 24,650.
3. Works well for Groundnut and Sesame (problematic for copra).
4. Works reliably - No stoppages, No overheating



Cost	**Rs.24,000-25000**

7. Working with Sanitary Napkins

Affordable

Field tested at North East Region

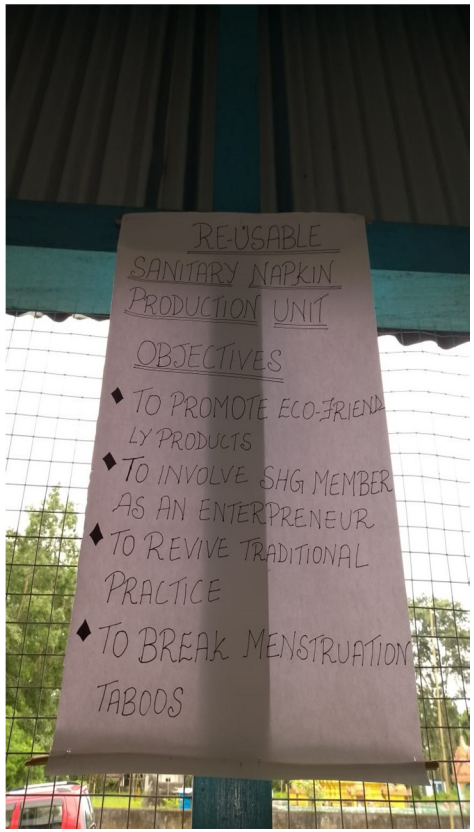
Supported by -

Technically Mentored -PSA office

RuTAG Centre – IIT Madras

Financial - M/o DONER

STATE	LOCATION
ASSAM	Mahur, Dima Hasao at the house of the president of Viva Federation
ARUNACHAL PRADESH	Bordumsa, Changlang. Separate space , a community Centre given by NERCORMP
MEGHALAYA	Purashinga, West Garo Hills, run by Chokcshima SHG Federation. Unit runs in a vacant house organized by SHG.
MANIPUR	Ukhrul, Manipur run by IKRA SHG. Presently, it is running in UDCRMS Office campus organized by NERCORMP. Later may be shifted to a resource centre being developed by NERCORMP.



Awareness creation and training sessions by Jatan Sansthan in Arunachal Pradesh and Manipur

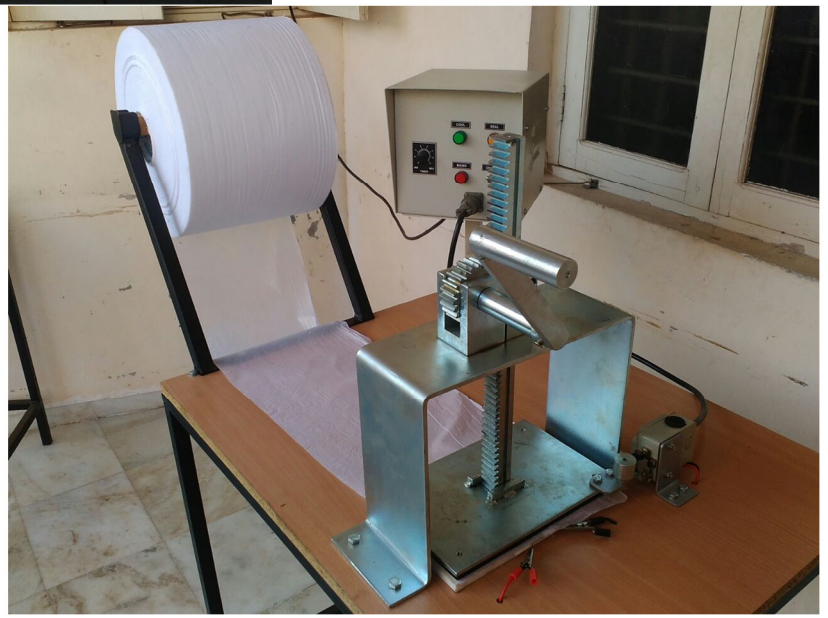


Awareness creation sessions in schools in Assam and Tripura by Ecofemme



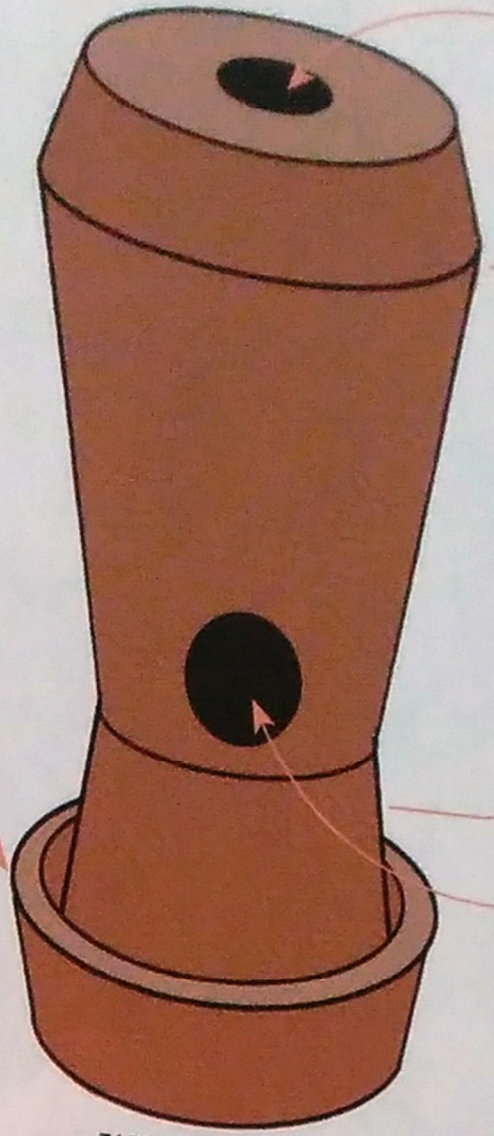
Baseline survey, production center and training session by Ecofemme (from left to right)

Sanitary Napkin Units – STINER



A neat solution

Ashuddhi-nashak is the only technology in the country to destroy used sanitary napkins



The lid is used to drop the used napkin

The central section holds the sanitary napkins and also works as a combustion chamber

The lid is used to insert burning newspapers

The false bottom is used to collect the ash

TARIQUE AZIIZ / CSE

soil since the

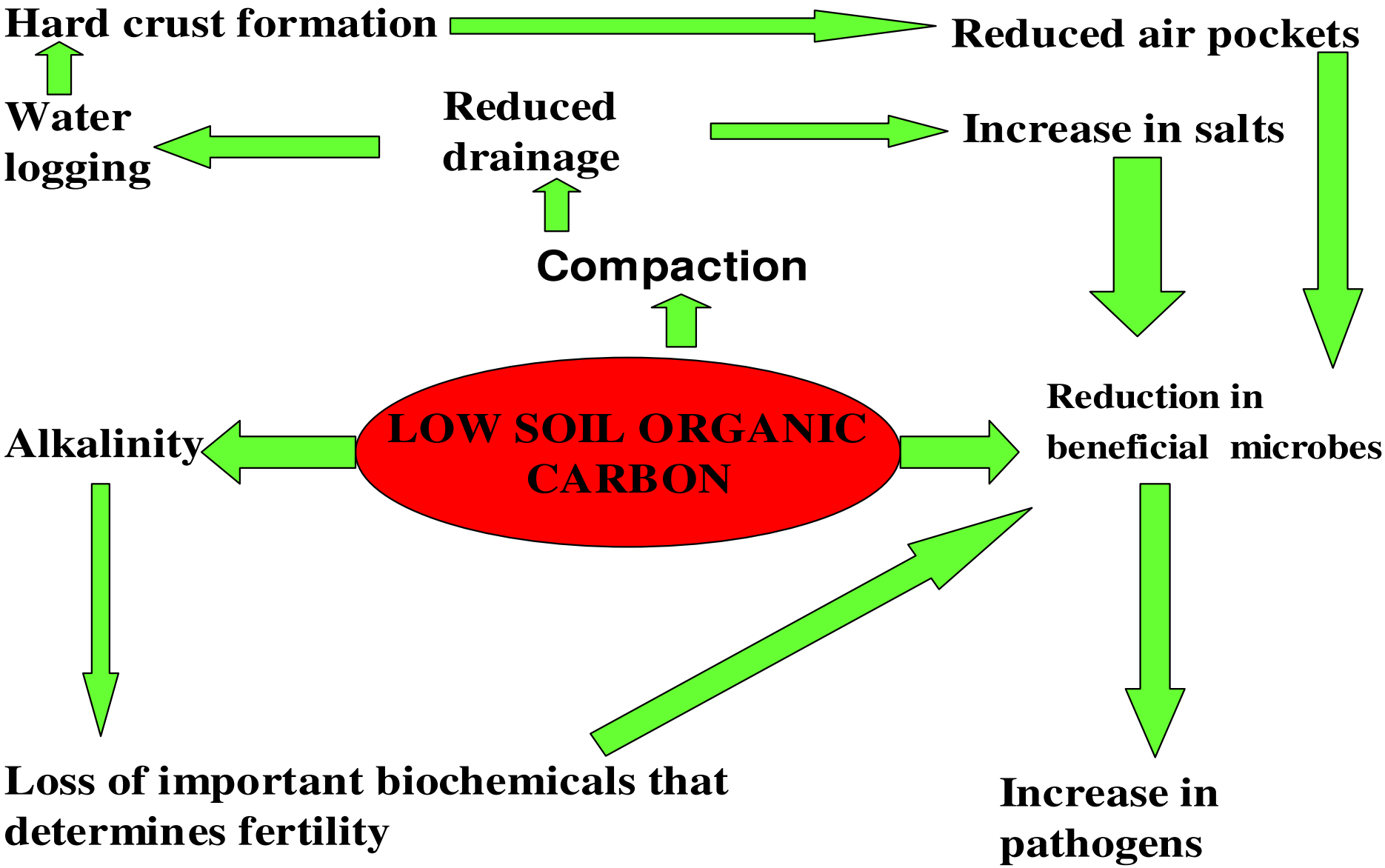

सैनेटरी नैपकिन
नष्ट करने का यंत्र
Professional

Soil Organic Carbon Kit

Developed by – Bhaba Atomic research Centre BARC

Supplied – Pan India / Various Countries

8. IMPORTANCE OF SOIL ORGANIC CARBON



Soil Detection Carbon Kit – Bhabha Atomic Research Centre (yBARC)

Soil organic carbon Kit -

✓Overall fertility indicator affected over a period.

✓The kit reagents are safe, and farmer can easily do the test at an affordable cost at the field.

✓The increased outreach of the technology would help the farmers in restoring soil fertility. SDG goals ,Overall Health

✓Evaluates the impact of organic carbon amendments,Gives idea of amount of organic manure additions necessary for better yield.

✓Highly economical as compared with other standard methods.

MODIFIED BICYCLE

- Disseminated 5 numbers of gents and 5 numbers of ladies bicycles to various rural areas of Assam.
- Feedback from end users are satisfactory .
- Vendors of rural areas found it very useful for transportation of goods

Modified Bicycle	Normal Bicycle
In modified cycle a vendor can save an additional amount of Rs 300/- to Rs. 350/- for carrying 15-16 bunches of bananas.	In Normal bicycle a vendor can carry 6-8 bunches of bananas.
Cost of the bicycle is Rs. 7,500/- (Gents) and Rs. 6,500/- (Ladies)	Cost of the bicycle is Rs. 5,500/-

Way Forward

Mechanism could be appropriately worked out to transfer the technologies with great speed at field level.

Details timeline could be mutually worked out by Member countries and AARDO and demands, selection of technologies and system support etc. may be considered.

-First step proposed by PSA office-

- ✓ **Transferring few identified technologies to the AARDO member countries**
- ✓ **All the member countries may like to select technologies from the ones which are presented today.**
- ✓ **The technology and nos. required to be shared to AARDO.**
- ✓ **Web meeting as required can be organized to get better clarity.**

Acknowledgement

- Prof. K Vijayaraghavan, PSA
- Dr. R. Chidambaram, former PSA
- Dr. Arabinda Mitra, Scientific Secretary
- Team RuTAG-All IIT PIs and staff
- Ms. Gunjan Rohilla

THANK YOU !

Together Lets MOVE forward ----

Combustion

- Combustion takes place at maximum three hundred degrees centigrade.
- Plastic needs temperature of 800 + degrees to burn. Plastic does not burn in Ashudhhinashak hence does not send out bad fumes.