The Operation Framework for a Successful SRI Program

Wan Mohtar Wan Yusoff and Anizan Isahak
Protem President and mama SRI-Mas
SRI-Mas

Keynote Address Persidangan SRI 2
11-13, Lumut, Perak. Malaysia

NOBODY CAN DO THIS ALONE. WE NEED ALL THE HELP AND SUPPORT WE CAN GET.

- Jazakallah to Febri for helping with the power point job at very short notice.

- The big picture: A scenario

The Economist Technology Quarterly June 12th 2010

Dawn of the Frankenfish

Food science: Fast-growing genetically modified trout and salmon could soon be the first transgenic animals on the table

THE Belgian blue is an ugly but tasty cow that has 40% more muscle than it should have. It is the product of random mutation followed by selective breeding—as, indeed, are all domesticated creatures. But where an old art has led, a new one may follow. By understanding which genetic changes have been consolidated in the Belgian blue, it may be possible to design and build similar versions of other species using genetic engineering as a

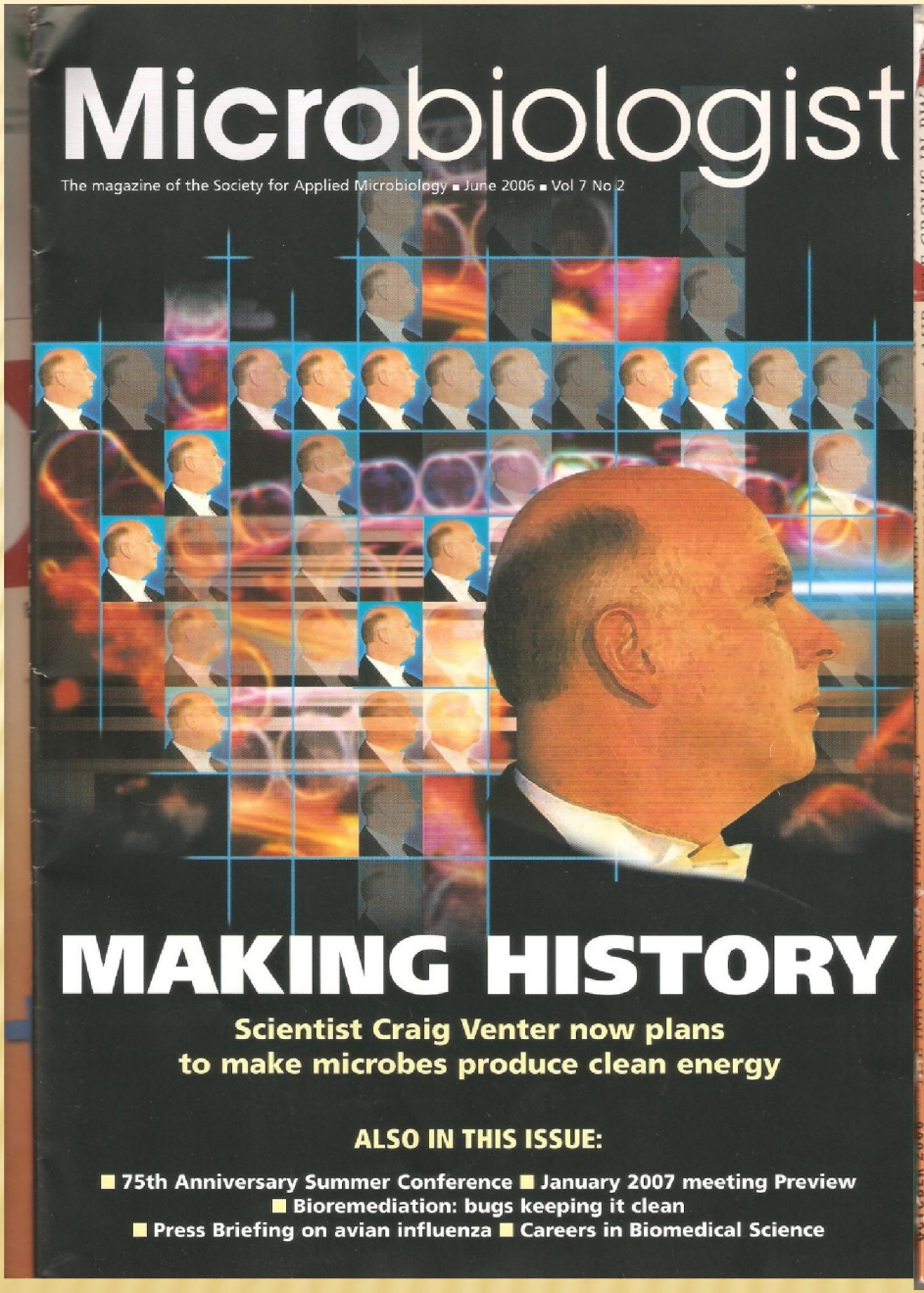
Behold, the transgenic salmon (top)

07/18/2011 07:24

taken from a chinook salmon, is a version of the growth-hormone gene itself. Unmodified salmon undergo a period of

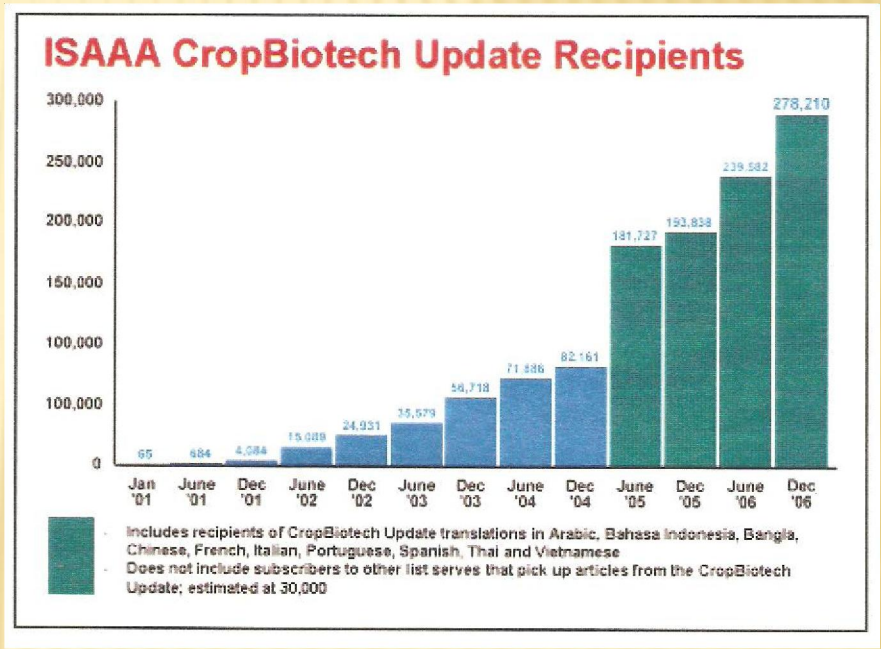
WHAT BOCOMES OF OUR FISH; SATU CONTOH HASIL TEKNOLOJI REKOMBINAN: IKAN SALMON JADIAN.

- What becomes of our researcher, our legislators, our farmers, our “Les environs”


Microbiologist
The magazine of the Society for Applied Microbiology ■ June 2006 ■ Vol 7 No 2
MAKING HISTORY
Scientist Craig Venter now plans to make microbes produce clean energy
ALSO IN THIS ISSUE:
■ 75th Anniversary Summer Conference ■ January 2007 meeting Preview
■ Bioremediation: bugs keeping it clean
■ Press Briefing on avian influenza ■ Careers in Biomedical Science


Ode
Muslim rock: Soundtrack for Mideast peace
WWW.ODEMAGAZINE.COM
For intelligent optimists
Big business goes organic
... here's what it means for you
Ode's Organic 17
The top companies and products of 2006
You don't need another pill, maybe you need more H2O
THE UNLIKELY RISE OF NOLLYWOOD
NEW ESSENTIAL TV
MAYORS REMAKE THE WORLD
HOW INTERNET WILL CHANGE BUSINESS
A MIRACLE GROWS IN RWANDA
DESIGNERS WHO GIVE A DAMN
VOLUME 4, ISSUE 8 OCTOBER 2006 U.S. $4.95, CANADA $5.95


FACE THE FACTS
Weapons or wealth?
$ 900 billion U.S.
Annual worldwide weapons spending
$ 150 billion U.S.
Yearly budget for all eight Millennium Development Goals*
1 Eradicate extreme hunger and poverty
2 Provide universal primary education
3 Promote gender equality
4 Reduce child mortality
5 Improve pre-natal health
6 Combat HIV/AIDS, malaria and other diseases
7 Ensure environmental sustainability
8 Develop a global partnership for development
* The Millennium Development Goals were developed by the United Nations to improve the quality of life of citizens worldwide, with a target completion date of 2015. All 191 member states agreed to participate, but have been sharply criticized for their lack of effort.
Marc Kolle, Dole / Source: The Inequality Predicament (United Nations Department of Economic and Social Affairs, 2005); World Bank's Development Report 2006: Equity and Development


ISAAA CropBiotech Update Recipients
300,000
250,000
200,000
150,000
100,000
100,000
0
65
684
4,084
15,089
24,931
35,579
56,718
71,886
82,161
181,727
193,838
239,582
278,210
Jan '01
June '01
Dec '01
June '02
Dec '02
June '03
Dec '03
June '04
Dec '04
June '05
Dec '05
June '06
Dec '06
Includes recipients of CropBiotech Update translations in Arabic, Bahasa Indonesia, Bangla, Chinese, French, Italian, Portuguese, Spanish, Thai and Vietnamese
Does not include subscribers to other list serves that pick up articles from the CropBiotech Update; estimated at 30,000

N48 SUNDAY STAR, 10 JUNE 2007

<WEDNESDAY

Nigeria sues Pfizer

The Nigerian government filed a lawsuit against pharmaceutical giant Pfizer Inc, asking for US$7bil (RM23.8bil) in damages. It alleged that Pfizer conducted drug experiments that led to death and disabilities among children more than a decade ago. Authorities allege that the company illegally conducted experiments of a drug, Trovan, during a meningitis epidemic.

Scientist set to make synthetic microbe

Effort to manufacture biofuels

LONDON: A scientist is poised to create the world's first man-made species, a synthetic microbe that could lead to an endless supply of biofuel.

Craig Venter, an American who cracked the human genome in 2000, has applied for a patent at more than 100 national offices to make a bacterium from laboratory-made DNA.

It is part of an effort to create designer bugs to manufacture hydrogen and biofuels, as well as absorb carbon dioxide and other harmful greenhouse gasses.

DNA contains the instructions to make the proteins that build and run and organism.

The J Craig Venter Institute in Rockville, Maryland, is applying for worldwide patents on what it refers to as "Mycoplasma laboratorium" based on DNA assembled by scientists.

Venter said: "It is only an application on methods."

As for whether the world's first synthetic bug was thriving in a test tube in Rockville, all he would say was: "We are getting close."

The Venter Institute's US Patent application claims exclusive ownership of a set of essential genes and a synthetic "free-living organism that can grow and replicate" that is made using those genes.

To create the synthetic organism his team is making snippets of DNA, known as oligonucleotides or "oligos", of up to 100 letters of DNA.

> »For the first time, God has competition«
>
> PAT MOONEY

The Canadian ETC Group, which tracks developments in biotechnology, believes that this development in synthetic biology is more significant than the cloning of Dolly the sheep a decade ago.

On Wednesday, an ETC spokesman, Jim Thomas, called on the world's patent offices to reject the applications.

He said: "These monopoly claims signal the start of a high-stakes commercial race to synthesise and privatise synthetic life forms. Will Venter's company become the 'Microbesoft' of synthetic biology?"

A colleague, Pat Mooney, said: "For the first time, God has competition. Venter and his colleagues have breached a societal boundary, and the public hasn't even had a chance to debate the far-reaching social, ethical and environmental implications of synthetic life." — © Telegraph Group Ltd, London

We need to tackle these issues immediately. With wisdom. With compassion. With lots of efforts and tawakkul.

Due to our own ignorance and arrogance; Serious Problems such as depletion of soil quality and health, ocean and ground water pollution, and emergence of resistant pathogens befall us by our own doing or worst undoing or not doing enough.

For our beloved soil

We have the proven solution, tested means and strong resolve.

Soil bacteria which flourish in the Rhizosphere of plants, and grow in, on, or around plant tissues, stimulate plant growth by a plethora of mechanisms

Phosphate solubilization,
siderophore production
biological nitrogen fixation
rhizosphere engineering
production of 1-Aminocyclopropane-1-carboxylate deaminase
phytohormone production
exhibiting antifungal activity
production of volatile organic compounds
induction of systemic resistance
promoting beneficial plant-microbe symbioses
interference with pathogen toxin production

Table 1 Growth factor produced by microbes

microbes	Factor Produced	Reference
Azospirillum lipoferum	Gibberellins	Cassan *et al*. (2001)
	N Fixation	Nayak et al. (1986)
Azospirillum brasilense	Gibberellins	Cassan *et al*. (2001)
	IAA	Mehnaz and Lazarovits (2006)
	N Fixation	Tien *et al*. (1979)
Zoogloea	N Fixation	Xie and Yokota (2006)
Azoarcus	N Fixation	Hurek *et al*. (2002)
Bacillus	Phosphate-solubilizing	Rodriguez and Fraga (1999)
Rhizobium	N Fixation	Yanni *et al*. (2000)
Pseudomonas fluorescens	N Fixation	Park *et al*. (2004)
	Phosphate-solubilizing	Vyas and Gulati (2009)
	Siderophore producing	Kloepper (1980)
Pseudomonas putida	Siderophore producing	Kloepper (1980)
	Phosphate-solubilizing	Wahyudi *et al*. (2011)
Azetobacter	N Fixation	Park *et al*. (2004)
Azorhizobium	N Fixation	Anyia et al. (2004)
Azospirilium	N Fixation	Park *et al*. (2004)

Table 2 microbes improve rice growth and yield

PGPR	Effect on rice	Reference
Azospirillum lipoferum	-Increasing biomass and nitrogen content of the rice tissue -Improve rice yield	Malik *et al*. (1997) Pedraza *et al.* (2009 Banayo *et al*. (2012)
Azospirillum brasilense	-Increasing biomass and nitrogen content of the rice tissue Improve rice yield	Malik *et al*. (1997) Pedraza *et al.* (2009 Banayo *et al*. (2012)
Zoogloea	-increasing biomass and nitrogen content of the rice tissue	Malik *et al*. (1997)
Azoarcus	increasing biomass and nitrogen content of the rice tissue	Malik *et al*. (1997)
Bacillus	Improve rice seedlings	Mia *et al*. (2012)
Rhizobium	Improve rice seedlings	Mia *et al*. (2012)
Pseudomonas fluorescens	Improve rice yield	Sakthivel and Gnanamanickam (1987)
Cyanobacteria	increasing N uptake	Carreres *et al*. (1996)

Table 3 Growth factor produced by microbes

PGPF	Factor Produced	Reference
Gliocladium virens	Lytic enzymes	Sreenivasaprasad and Manibhushanrao (1990).
Trichoderma virens	Auxin	Contreras-Cornejo et al. (2009)
	Jalicylic acid	Contreras-Cornejo et al. (2011)
	Jasmonic acid	Contreras-Cornejo et al. (2011)
Trichoderma harzianum	Phosphate-solubilizing	Saravanakumar *et al*. (2013)
	Siderophore producing	Rawat and Tewari (2011)
Trichoderma viride	Phosphate-solubilizing	Saravanakumar *et al*. (2013)
	Siderophore producing	Rawat and Tewari (2011)
	Cellulose degrading	Jiang *et al.* (2011)
Aspergillus niger	IAA	Bilkay *et al*. (2010)
	Gibberellins	Gujar *et al*. (2013)
	Phytase producing	Gujar *et al*. (2013)

Table 4 microbes improve rice growth and yield

PGPF	Effect on rice	Reference
Gliocladium virens	Improve rice seedling growth	Mishra and Sinha, 2000
Trichoderma virens	Improve rice seedling growth	Mishra and Sinha, 2000
Trichoderma harzianum	Improve rice seedling growth	Khan *et al*. (2005) Shukla *et al*. (2012) Mishra and Sinha, 2000
Trichoderma viride	Improve rice seedling growth	Al-Taweil (2009)
Aspergillus niger	Improve rice seedling growth	Mishra and Sinha, 2000
Candida tropicalis	Improve rice seedling growth	Amprayn *et al*. (2012)
Trichoderma ghanense	Improve rice seedling growth	Banaay *et al*. (2012)
Lepista sordida	Increased rice grain yield	Choi *et al*. (2010)

Mycorrhizal Fungi: a class of microbes

Arbuscular mycorrhizal (AM) fungi are vital components of nearly all terrestrial ecosystems

Forms mutually beneficial symbioses with the roots of around 80% of vascular plants and often increasing phosphate (P) uptake and growth.

REPORTS OF THE ABILITY OF MYCORRHIZAL ON ENHANCING RICE GROWTH OR YIELD

Hajiboland *et al*. (2009), Secilia and Bagyaraj (1992), Secilia and Bagyraj (1994), Solaiman and Hirata (1997), Li *et al*. (2011), and Zhang *et al*. (2012). Yeasmin *et al*. (2007), Isahak *et al.* (2012), Zhang *et al*. (2005) and Xu *et al*. (2013).

Titik mula perlu;

Pemetaan dan pengkhazanahan mikrob berasaskan:

-peristilahan berdasarkan bahasa serumpun,

-pembangunan kerangka ilmu mengikut acuan kebangsaan,

-pengungkapan ilmu untuk pembangunan masyarakat dan

-pemasyuran gagasan acuan kita seantero

- Apakah padanan lebih serasi untuk perkataan mikrob, mikroba?

Mungkinkah **Kuman ???**

- Kamus Dewan edisi baru 1989 memberi perkataan kuman sebagai sesuatu(**makhluk**) yang sangat kecil atau seni.

Kamus R.J. Wilkinson (1903) = **kuman** adalah ***a very small louse*** dan seterusnya perturunkan peribahasa dan pemerhatian berikut,

- ‘Sa-ekor **kuman** di-benuwa China dapat di-lihat, tetapi gajah bertangkap di-batang hidong tiyada sedar’

- ‘Sa-ekor **kuman** kena pelantek, Darah menimpa sa-rata alam’
- ‘Hati gajah sama di-lapah, Hati **kuman** sama di-chechap’

- Mencungkil **kuman** dengan alu memperihalkan membuat pekerjaan yang sia-sia.
- **Kuman** menjadi barah perihalkan perkara kecil menjadi besar kerana dibiarkan.

Ternyata perkataan **kuman** sudah terbudaya di Alam Melayu untuk menjelaskan:

1-sesuatu yang sangat kecil,

2-sebab musabab atau pembawa penyakit,

3-sebagai pengajaran,

4-bahan makanan

Makanya,

- kami mensarankan perkataan **kuman** mengantikan perkataan mikrob atau mikroba

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE.

PLEASE BEAR WITH ME. THIS COMES DEEP FROM MY HEART.

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

The 7OF-SRI focuses on the transformation of vast acreages of the heart of the advocate and not the terrestrial acreage. It begins with the declaration that;

“There is no other way but SRI way”

A brave and sincere first step.

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

The Challenges: The acceptance of System of Rice Intensification (SRI) in most countries has been lukewarm to the point of unexplained resistance by government agencies dealing with anything concerning the planting of rice. **For reasons best known to them.**

For us: "There is no other way but SRI way"

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

The advocates say:

On the contrary, slow but strong acceptance to the point of becoming an obsession (Lirik Lagu Gila bears testimony to this strong acceptance amongst SRI advocates in Malaysia)

For us: "There is no other way but SRI way"

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

Kita Orang Gila (*We are labeled madman*)
Orang Gila Kita (*People taunt us as mad*)
Jika Tidak Gila (*If we are not mad*)
Bukan Orang Kita (*You are not with us, maaan*)

Gerakan Insan Lestari Alam = GILA=Mad=Majnun

For us: "There is no other way but SRI way"

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

The support: Intensive and extensive supports by researchers in Universiti Kebangsaan Malaysia, Universiti Putra Malaysia and several others are joining. Organizations especially Seacon, Felcra Training and consultancy, and Bernas has been the main movers.

For us: "There is no other way but SRI way"

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

More supports: some local authorities are involved heavily on the ground especially in Tanjung Karang, Selangor, Sri Lovely, Kedah and at Tunjung, Kelantan.

The Platform: Sri-Mas, a non-governmental coalition of concerned researchers across Malaysia, are emboldened by strong support from friends in the corporate sector (BERNAS, Tradewinds…)and from the cooperative movement, UNIKEB (having declared their readiness to market SRI rice), ANGKASA , KEDA, Jab Pertanian Kedah dan Sabak Bernam, TWN and MOA Malaysia.

THE SEVEN OPERATION FRAMEWORK FOR SRI (7OF-SRI) ADVOCATE

SRI-Mas: Malaysian Agro-ecology Society For Sustainable Resources Intensification.

A new phase begins. Intensifying association of energies.
Please acknowledge core members: Dr Anizan, Dr Anni, Prof Rosenani, Dr Muhammad Saiful, Dr Siti Hajar, Sdr Rohaizad, Mak Tam, Pak Tam, Pn Nor Wahida and husband, Dr Norela, Hj Marzuki Md. Zain, Pak Saepudin, Kapt. Zakaria, Pn Salwati, Dr Siti Zaharah, Dr Alfitr, Azmir Firdaus, Mohd Roslan Bani.....dan rakan2.

For us: "There is no other way but SRI way"

UNIVERSITY NETWORKED WITH SRI-MAS

Universiti Kebangsaan Malaysia
The National University of Malaysia

Universiti Malaysia Kelantan

UPM
Universiti Putra Malaysia
Berilmu Berbakti

UUM
Universiti Utara Malaysia

Universiti Teknologi MARA

SRI-Rice
SRI International Network and Resources Center

Cornell University
Cornell International Institute for Food, Agriculture and Development

- And with many other organizations especially farmer-based:
- Women Farmer Group Kelantan
- PACOS/Farmer Sabah
- SRI Farmer Malaysia
- SRI Farm and BioValley
- NS Nature Rice.
- .....more to come.

WHAT NEEDS TO BE DONE IN THE 7OF-SRI?

First STEP: make a declaration, like declaring an article of faith.

Will face the resistance from farmers, agencies that for decades have implemented non-SRI approaches, suppliers of seeds and chemicals, farm services operators, rice millers, rice distributors and even from non-SRI extension workers**. They could be from amongst those very close to you at heart.**

Second STEP: persevere and endure (sabr) the barrage of criticism meted against the self-declared SRI-person (man or woman) or the demands of the 6 approaches needed for a 100% SRI ranking.

Sabr and fully aware of challenges ahead. A going up-hill task that rewards you with a feeling of resignation (redha) to your creator.

Third step: Constantly remember your declaration, again and again as that would be the source energy point to fall back on. This will put into the background those early resistances.

This step (termed dzikrullah in arabic in relation to the Shahadatain, declaration) that stipulates constant remembrance to the declaration to **become a successful SRI farmer** is the neutralizer/stabilizer to manage stress at a level that do not interfere with a 100% SRI operation.

Fourth step: a natural progression emerges as you move into the realm of acculturation of SRI operation and the witnessing (Ashhadu) the emergence of rice growth never seen before.

-a state of thankfulness (Shukranlilah) to being in a new state of realization about rice , its environ and its cosmology.

Keeping the goal in mind: Completing all 6 requirements of SRI to become **100% SRI.**

Fifth step: The act of staying the course (istiqomah) will open up more doors for self-actualization and contributing to community empowerment within an enggaging networking framework.

This stage of experiential learning and the manifestation of the goodness in SRI approaches will develop a situation where the dictum of prosper thy neighbor becomes expressed in its full form and function

The target: completing all 6 requirements of SRI to become **100% SRI are in sight.**

Sixth step:

The SRI and non SRI farmers will be in an integrative mode, albeit at an initial slow rate, and until acts of sadeka or khidmat becomes immersed in them. They will be intoxicated by its manifestation.

The end in clear sight: **The completion** of all 6 requirements of SRI to become **100% SRI.**

Seventh step:

The acculturation of doing things as part of worship or *ibada* to the one-true Creator as the full expression of the implementation of Sunnahtullah (in all sincerity, *ikhlas*) bears its pristine reality.

The sweetness of arriving at the 'Station': A 100% SRI station. A journey into the hearts of men and women.

Things to do for SRI-Mas:

We list 5 things to do by SRI-Mas executive committee to support this operation framework to achieve a nationwide advocacy of SRI approach in a sustainable way.

1-To set-up register of SRI farmer

2- To set-up REAL (recognization, accreditization, and licensing) initiative for SRI approaches.

3- To set-up SRI outreach task force involving researchers, farmers and legislators.

4- To set-up a nationally networked distribution centre for SRI rice to ensure realistic pricing.

5- To set-up an international forum for sharing of SRI advocacy.

Once again allow me to repeat.

1-To set-up register of SRI farmer

2- To set-up REAL (recognization, accreditization, and licensing) initiative for SRI approaches.

3- To set-up SRI outreach task force involving researchers, farmers and legislators.

4- To set-up a nationally networked distribution centre for SRI rice to ensure realistic pricing.

5- To set-up an international forum for sharing of SRI advocacy.

Things to always do by SRI-Mas: Always thankful for all supports.

Jazakallah and wassalam.

wantarukm@gmail.com

TERIMA KASIH DAUN KELADI

- Terima kasih atas perhatian dan perkongsian pengalaman
- Salam Hormat
- Wassalam
- Semoga usaha kita dimakbulkanNya