American-Eurasian J. Agric. & Environ. Sci., 13 (10): 1412-1439, 2013
ISSN 1818-6769

DOI: 10.5829/idosi.aejaes.2013.13.10.11253

Racy Nature Agriculture Versus Other Alike Technologies: A 'Technologies' Contrast

R.C. Yadav

Ex Principal Scientist and Head of Centre, Central Soil and
Water Conservation Research and Training Institute Research Centre,
Chhalesar, Agra, 282006, Uttar Pradesh, India

Abstract: Global worry prevails on the worsening situation of pressure of food requirement, quality and environment protection for the present and the posterity. The mechanisms of plant food production processes are universal, but, the world over different practices and technologies are produced on justification plea of variations in climate, ecosystem, soil, crops, cropping practices etc. Under these circumstances the resources degradation, stress on the production factors and emission of green house gases (GHGs) have increased. Several known prominent technologies recommended and adopted for different climate, agro ecosystems and crops do exist globally. Some technologies have enhanced yields of specific crops, particularly wheat, maize and rice, but have no positive influence on the reductions of emission of GHGs. This has not enabled world over development of any innovative technology of universal application. This research developed, based on innovative application of scientific facts, alive, smart and enthusiastic (racy) nature agriculture, which encompasses unique feature, classically different from the known and existing technologies. This technology is universally applicable for all climates, ecosystem, soil, crops and varieties. The technology is capable of devising and accomplishing challenges that pave the developmental paths of sustainable food security and protection of environment. The objective of this study was to carryout contrast among the known and recommended technologies against the racy nature agriculture. Performance indicators are devised to identify the potential technologies for conducting contrasting comparison of the available technology against this one. The racy nature agriculture proves to be the most efficient in terms of yield productivity, food quality and protection of environment. It is imperative that initiative on application of the racy nature agriculture will fulfil all aspiration and expectations necessary for development of food security and environment protection. The technoogy application is a panacea solution for building global food security and protection of environment for the present and the posterity.

Key words: Nature agriculture · Organic food · Sustainable food and environment development · Raised bed cultivation · SRI · Watershed management

INTRODUCTION

Agriculture largely can be categorised in two divisions viz genetic improvement aspects that constitute crops and varieties and other appropriate improvisation having nutrient, water, planting, weeding, tillage and plant protection measures and harvesting and post harvest cultivation etc. There are many visions on how to achieve a sustainable agriculture that provides enough food and ecosystem services for present and future generations in an era of climate change, increasing costs of energy, social unrest and financial instability and increasing environmental degradation. Only those styles of agriculture that meet the established threshold criteria while advancing rural communities towards food, energy and technological sovereignty would be considered viable forms of Green Agriculture Parviz *et al*. [1]. Considering the diversity of ecological, socio-economic,

Corresponding Author: R.C. Yadav, Ex Principal Scientist and Head of Centre, Central Soil and Water Conservation Research and Training Institute Research Centre, Chhalesar, Agra, 282006, Uttar Pradesh, India.

historical and political contexts in which agricultural systems have developed and are evolving in, it is only wise to define a set of flexible and locally adaptable principles and boundaries of sustainability and resiliency for the agro-ecosystems of the immediate future. That means it requires search of practices that fulfil the referred requirements. These can be acquired by experience of long term used and/or by application of scientific principles. Agriculture in general has been enriched by wisdom and wealth of long term use experience and hardly on the second aspect of scientific principles, in the strict sense.

The growth is driving an expansion of interest in 'green' and sustainable food, food that is perceived to be healthy, safe and environmentally friendly. In his classic book on agriculture in Japan, Korea and China, entitled, "*Farmers of Fortieth Century"*, University of Wisconsin scholar F. H. King wrote admiringly of the intensive cultivation practices and economies that enabled Asian farmers to feed many more mouths per acre than was considered possible at home in the American heartland. China has a rich and well-documented history of diverse sustainable farming practices, 'sustainable' in the sense of being maintainable and maintained, over long periods of time. Examples include the productively bio diverse paddies of traditional rice–fish, rice–duck and rice–fish–duck cultivation systems in Central and South China [2],

The book did not specify any innovative method in paddy culture in addition to the prevalent practices in vogue, however. It laid concern on management and coordination of marketing and sale, entirely different issue on economic developments. How to effectively connect some 200 million smallholder farmers with large national and international markets as China becomes ever-more-integrated into the global economy. There are deeply entrenched problems of information and infrastructure in this regard: supply chains are often long and opaque and prevailing market structures do not provide mechanisms through which quality attributes of agricultural products can be recognized and rewarded. This amply displays the environmental consciousness of paddy culture in China since ancient time.

There exist no universal approach and practices vary on the plea of researchers supported by justification of climate, ecosystem, soil, water, crops varieties and socioeconomic aspect of the place of concern. While the plant nutrient uptake, nutrient requirement pattern, principle of processes that enable such condition conducive to plant growth remain fixed, there can be one way to do it in the similar universal way. An innovative technology based on application of scientific facts was developed as universally applicable green technology and named as racy nature agriculture. The objective of this study was to compare and contrast the well known and prominent technologies of agriculture against this innovative technology. The green technology taken as base for all type of climate, agro-ecosystems, soil and climate crops and varieties, the prevalent practices have been contrast for paddy which is known to become staple food for almost half of global population. The paddy culture thrives in wet land ecosystem; therefore, the practices of this regime are taken for contrasting with the reference technology capable of enhancing productivity of land, water, nutrient, ecosystem and protection of environment. Globally the paddy cultivation has been blamed to methane addition in the atmosphere that is known to cause global warming triggering the climate change. The increase in food demand entails large scale intensive cultivation of paddy that builds up the ongoing problem of green house gas accumulation of GHGs making the global problem of sustainable food and environment.

The manuscript comprise the description details of the racy nature agriculture a green technology and other prominent known paddy cultivation technologies world over, their contrast to establish the relative merit, proposal for rational initiatives to bring the beneficial impact in paddy productivity and protection of environment for the present and posterity. The quality of produce, food chain and ways and means of improvement are prescribed to make the universal application of racy nature agriculture for enhancing food productivity and manoeuvring GHGs emission to abet the climate change. The meaningful conclusions and research needs are presented to tackle aspects of food and environment for the present and posterity.

The Paddy Cultivatiion Technologies

Racy Nature Agriculture Technology

The Technology: A knowledge intensive green technology for the time sequence and convergence based new live, smart and enthusiastic (Racy) named as, Racy Nature Agriculture was innovated to alleviate the drudgery of the adverse factors in present day agriculture and convene sustainable global food security and protect environment.

Factors such as increased population pressure, faulty agriculture practices, environment pollution and global warming are blamed world over by all involved in the activities, for the factors adverse impact on water, environment and food production. In reality it is not

wrong, but there has been no way out to cope up with the worsening situations and find feasible and practical solutions. Many national and international institutions have been carrying out researches, but it has not so far been possible to answer the following questions related to global scenario of food, agriculture and environment. This fact is revealed by setting questions whether it is possible to find answer for how to:

- Link people, agriculture and environment?
- Bring global food security with environment protection?
- Develop solutions for arresting GHGs to counter global warming and averting climate change?
- Use present worsened situation of resources and conserve them for posterity?
- Develop universally applicable technology for all ecosystems, soils, crops, water qualities and irrigated as well as rainfed agriculture?
- Improve quality of primary produces of food, food chain and fodder etc?
- Enhance nutrient, moisture and other resources use efficiency?
- Make best use of known primary and perspective secondary natural resources?
- Surpass and overtakes all previous practices of agriculture?
- Develop resilience inherited compensating technology to follow up, even on middle paths of partial application, to enable all stake holders to join and become part of any mission in the domain of food, agriculture, quality and natural resources conservation.

To answer the vital issues raised by the aforesaid questions strategy of the present research was to create ideal conducive condition, for all time, convening aerobic water and environment interactions for nutrient and water uptake by plants with reduced release of green house gas (GHGs) and eliminate inimical substances that emerge in the process. Following scientific and engineering set of designed right paths and free from any scientific flaw or its contraventions, Racy nature agriculture was developed. Band of best practices supported by the scientific facts form the panacea green technology capsule prescriptive for ameliorating agriculture and environment. It promotes productivity with existing situation and conserves resources for posterity. It is a panacea technology suitable for all agro-eco regions, climates, soils and crops and water quality conditions. For example, the racy nature agriculture is applicable even for cactus, a desert nonconventional fruit cultivated in Yemen in Gulf countries to the other extreme of wettest environment experiencing highest rainfall for paddy crop at *Cherrapunji*, India. It is also equally applicable for controlled environment agriculture such as green house and poly house. Thus, the technology has capacity to endure adverse impacts of droughts and floods that are likely to become severe due to global warming and climate change in future. The racy nature agriculture focuses and meets world over challenge in the use of natural and fixed resources for agriculture and environment conservation, which have not been found in the existing scientific ventures.

The technology capsule components have been validated for their efficient working. The scientific publications and presentations on the related science and engineering of racy nature agriculture technology capsule have been documented. Validations of component practices and the composite technology fulfil, to large extent, the validation need of composite technology capsule of nature agriculture. Thus, the technology surpasses and overtakes all known and existing research and developments in agriculture, food production and environment protection. The racy nature agriculture fulfils and accomplishes challenges related to global agriculture, food, environment and people. It has accomplished the challenges of natural resources management (NRM).

The technology will usher global revolution in land and water resources use for bringing food security. Local optimisations of the technology will take care of customization accuracy to account for existing roles of agro-eco-regions, man- machine and socio economic status. The alteration of decomposition process, arrest of GHG gases and heavy metals will reduce GHG s load in atmosphere, reduce load of heavy metals that will reduce global warming and avert climate change. This aspect, totally new application in agriculture will produce food better than so called organic food. Thus, in lieu of some high profile accessible limited organic food, a better quality and accessible to all surpassed solution for all is developed. Further scope for refinements for the second generation research is opened so as to bring technology refinement. The lag in the situation and makeup in the shortfall in present day agriculture can be made by recognition of motivation by oriental saying i.e. late is better than never. Therefore, it requires to makeup of mind, without further delay and come in action for implementation of the racy nature agriculture. The implementation will revamp all to join in mission to create Manson of global sustainable food sufficiency for present and posterity.

Technology Characteristics and Status:

- It is crystallised scientific principles based innovative technology for agriculture in vogue.
- This is water and environment interactions based knowledge intensive technology convergence research.
- The technology uses aerobic decomposition process that will eliminate release of methane and enhance water and nutrient use efficiency. Bio charred cover will absorb gases and adsorb heavy metals that will further reduce GHGs load and clear environment of polluting gases and heavy metal pollutants. The technology and accessory research developments will make total arrest of GHGs to reduce global warming and avert climate change.

Technology Capability:

- It has capacity to endure to withstand the global warming and climate change.
- It links people, agriculture and environment.
- It identifies and fulfils global challenge for charter of agriculture for food security with environment protection.
- It makes best use of present situation and conserves resources for posterity.
- It is universally applicable for all ecosystems, soils, crops, water qualities and irrigated as well as rain fed agriculture.
- Using the premises new practices are developed for horticulture, forestry and agro forestry.
- It improves quality of primary produces of food, fodder and food chain.
- It enhances nutrient, moisture and other resources use efficiency.
- It makes use of known primary and perspective secondary natural resources.
- It surpasses and overtakes all previous practices of agriculture.
- The technology enables bringing further improvements in best claimed innovative practices in Indian agriculture.
- The racy nature agriculture enables devise technological innovations for creating lively hood (Jeevika), by making flexible multi story use of space and time.
- It will require new tools and machineries for implementation. Additionally, it inherits compensating resilience to follow up, even on middle paths of partial application of the technology, to enable all stake holders to join and become part of mission of racy nature agriculture to build global mansion of sustainable food security.
- The transformation of agriculture in to the racy nature agriculture will enable introduce service sector that will generate permanent season bound specialised job works. This will promote extension of new agriculture system and increase in the GDP in agriculture, which occupies major share and control national economies.

The Technology Development Process: The biological process encompasses physical, biological and chemical components. The components are to be selected and synthesis so that it creates conditions where in the biological productivity is enhanced. Historically, the knowledge about agriculture emerged by seeing things that what had happened in the nature and then people pondered to find ways and means to make that viewed process get more productive. Thus, knowledge in agriculture emerged from the case studies and success stories. The type of approach took ground and it became a sound foundation in agriculture. For any development the success story expected and plays a guiding factor to support the agriculture in vogue. This has been the global scenario of agriculture.

Figure 1 shows genetic and improvising innovative scenario of racy nature agriculture. Note the lower left part of Fig joins with plain line, meaning thereby that genetic improvement of agriculture is not part of this racy nature (improvisation) agriculture. Any variety of crops has to be sown and if it includes improved crop variety the magnification in the yield will get enlarged.

The global scenario and pro and cons results have been accepted. There has been no any breakthrough in that respect to say. Agriculture remained in vogue and it became culprit of good and bad practices and got bogged down by the bad situation resulting in loss of productive capacities and degradation of the resources. Thus, agriculture remained in vogue i.e. a science of practice and remained far behind to become practice of science. In the same situation the global agriculture has been sinking and with the increase in the global population worries of future sustainability remains as whole some concern for the global food situation thinkers.

For any good sustainable development there remain two contributing factors. The first is the genetic factor and the second remain as improvising factors. Undoubtedly there have been miracles of innovations that enable agriculture march to cope enhanced need of food with the ever increasing population. However, such

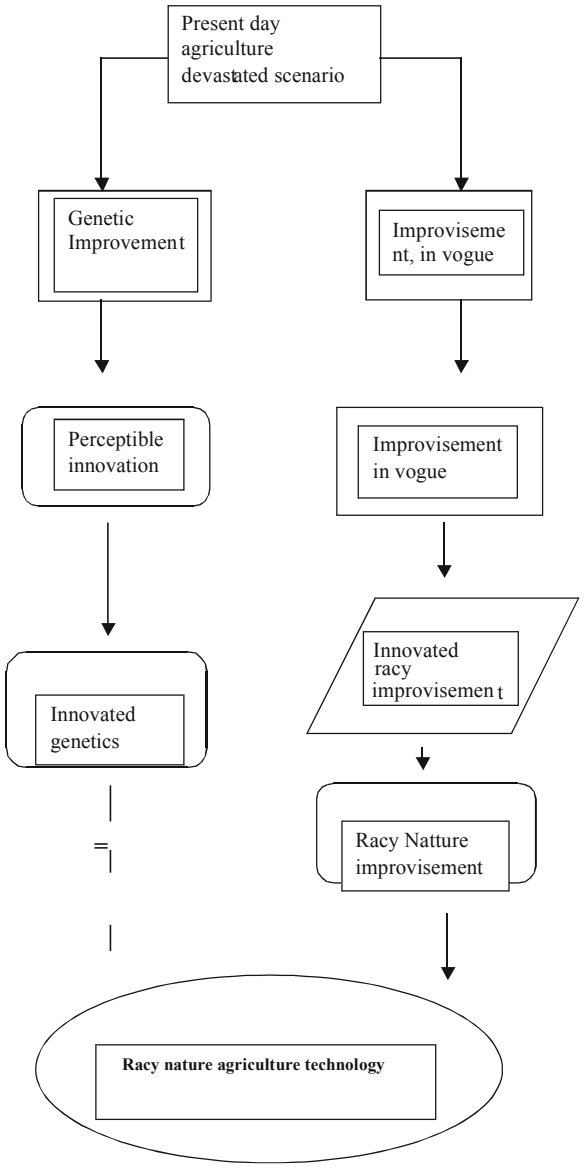

Fig. 1:

miracles had never emerged that can be considered to add global sustainability of agriculture. Very few aspects have in part and here and there in the process of trial and hit have emerged. The benefits of such results have been harnessed but the real knowledge gap did not make it become sustainable and attract innovations.

The entire scenario is depicted in Fig. 1. No innovative revamping the second arm of improvisation has so far come as resolving challenge. In this research the agriculture vogue has been made science based and equally strong innovation brought in. By synthesising the second arm the racy nature agriculture technology has been produced. It is the broad base technology which is suitable for all crops, varieties, ecosystems, continent, both irrigated and rainfed agriculture. This research brings an innovation in the other arm of improvisation and brings the innovative racy nature agriculture by itself that will apply with or without genetic improvement. It does not claim the genetic improvement as part of this racy nature agriculture. Use of varieties with or without genetic improvement, as depicted by plain line in the left arm of the figure, makes the racy nature agriculture. The technology removes the stigma of producing degradation of environment and degradation of resources, rather it improves the situation. The nature agriculture enables make any innovative decision in support of need of site, situation, resources and people by customisation. Thus, the racy nature agriculture really fulfils goal of a new strategy of think global and act local. This situation will promote quality of indicators which will demand strong wing of geographical indication registry (GIr) and IPR patenting to benefit consumers and producers and discourage imitations.

The Word Racy, Nature Agriculture and Improvisation Emblem: It is clarified how the word racy is selected here and what significance it depicts in this innovative agriculture technology. Agriculture encompasses three processes viz, biological for which it has to be alive, physical, for which it has to be strong i.e. smart and chemical process for which it has to be beneficial leading to maintain enthusiasm (Table 1). Thus, in order to take care of these facts of three words viz alive, smart and enthusiastic use is made of an English word racy.

Since plants grow and bear fruits complete their life cycles and get decomposed via any route, again when environment is suitable, they start their cycle again. In the process of growth and decomposition there are good and bad by- products. In order to keep resources and plant growth space resources clean and continuous, the products have to be always good. The good condition support the requirement as racy as explained earlier. It has to be customised and in order to be sustainable i.e. continuous and dynamic hence, word nature is included to represent the sustainability. It is known that when a practice becomes natural it becomes a habit. Thus, word nature represents a technology of sustainability.

In the good and bad product producing situation it is equally essential to think on the bad product producing process, which comprise decomposition. In decomposition bad gases reflect release of toxic gases and residue of toxic salts, which accumulate in the medium of growth, deter the functions. These functions appear in soil, water and environment, i.e. medium of plant growth.

Table 1: Description of the nomenclatures, Racy, nature and New culture monogram

S.No.	Processes	Paths	Characteristics	Nomenclature
1	Biological	Good	Alive	Racy, an English word
	Physical		Smart	
	Biochemical		Enthusiastic	
2	Biological	Bad	Eliminate	Cultivate habit as a nature to signify, sustainability
	Physical		Eliminate	
	Biochemical		Eliminate	
3	Improvisation	Good and eliminative for all time	New culture monogram	

The racy nature agriculture has provisions to flourish under any condition without causing any bad situation by its own cycle of function, thus, it is fully environment protection conscious. It is not mere eco-friendly, but it utilises ecosystem resources for making good use and reduce burden of bad things viz pollution. Hence, it eliminates release of green house gases (GHGs) that goes in favour of reduction of global warming and abetting the climate change. Hence adoption of racy nature agriculture technology lessens worries of climate change and global warming and building burden of climate change. By this statement it should not be construed that there will not be global warming as all is being care taken by the racy nature agriculture. Agriculture and many other contributing factors contribute the GHGs. When contribution of agriculture is contained, contribution to GHGs addition still will continue. Thus, global warming will continue devoid of contribution from agriculture as reduced by the racy nature agriculture. The food production will continue to flourish.

This researcher has developed methods to control GHGs emission emanating from any sources to the extent of total eradication/arrest to counter global warming and abetting climate change, under another mission i.e. the Earth cares. The Earth cares endeavour is another broad subject beyond the scope to be covered under the racy nature agriculture. The racy nature agriculture is one of the approaches to contain GHGs from agriculture to reduce global warming and abetting climate change.

It is customary to represent level of care by holding a young sapling in soil in the saucer made by folding palm of hands. There is still need to represent that care by good environment. The loosening of soil of the base of young sapling depicts weakening of foundation where the plant is to establish and flourish. Now it should be replaced by good environment solid foundation providing situation of improvisation as depicted in the figure 2. The border furrow provides moisture and raised bed provides continuous good environment to support high density population. This represents a mark of broad based sustainable improvising function.

There has been craze for organic food. What is guarantee that the organically produces food will not contain toxic gases, solids and heavy metals in it. In the innovative practice of racy nature agriculture provisions are made to eliminate these bad products and their uptake by plants. Hence, era of organic food should be deemed over after launch of the racy nature agriculture. The organic food considered to be luxury of very privileged ones and affluent groups, the racy nature agriculture breaks the barrier and makes even better quality product to all strata of common society. Nature food should replace the organic food and it deserves to be given National and Global status.

Plants take water and nutrient by root hairs from the growing medium by the process of absorption. This is the only universally one way by which crops, horticultural and forestry plants take nutrient and water to support their growth and plant functions. This gives exclusive need to create condition so that plant function is efficiently performed. It means there could be a universally system to supports crops and tree plant growth. Thus it became imperative to develop a practice which will be universally applicable. The racy nature agriculture has all needed features of bringing universal environment for growth; hence it is a universally applicable technology.

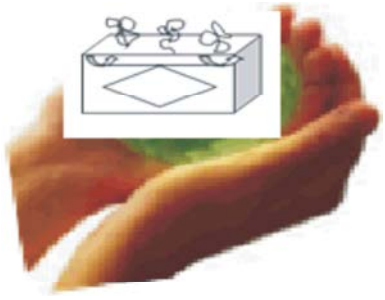

Fig. 2: New emblem for nature improvisation

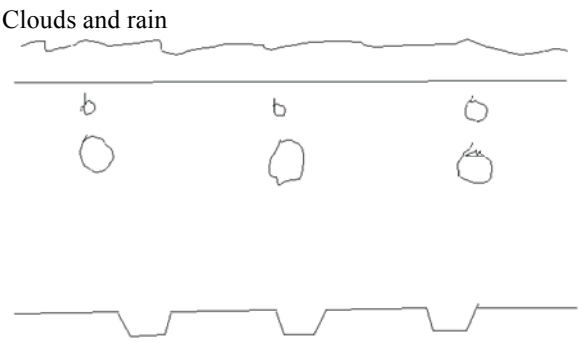

Fig. 3: Land formation of raised bed and furrow for Racy Nature Agriculture under rainfed situation

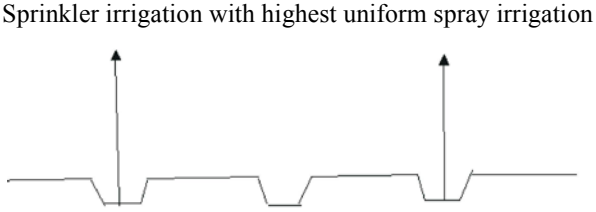

Fig. 4: Land form of raised bed and furrow and sprinkler irrigation for Racy Nature Agriculture

Largely, research is carried out by the state, central, national and international support group of institution. Research is considered as the legacy of such organisations. The racy nature agriculture is scientific development based on endeavours of individual researcher. It should be weighed on the basis of value and services that its application is going to bring in. Hence, the racy nature agriculture should be taken free from the customary monopoly and binding of legacy of institutions.

- Basics of water technology

[The raised bed- furrow land form supplements adequate oxygen diffusion in the root zone, increased moisture and nutrient reserve for plants under water logged as well as dry condition. Its local customisation is to be researched upon.]

[The sprinkler spray application of irrigation water will increase oxygen content; it will supplement the raised bed enhanced storage of nutrients and moisture and sufficiently aerated, occasionally saturated and drain off the excess water to keep always convene aerobic decomposition of organic and cellulose. This will supplement plant nutrient by way of enabling sulphur cycle to function. This situation brings good water and air interaction].

Other Prominent Technologies

Raised Bed Cultivation (RBC): In the raised bed cultivation practice larger amount of water is held up in the increased soil depth than that in the flat bed cultivation. In India people praise the raised bed cultivation for saving in irrigation water and crop getting border effect for profuse growth and unexpected high yield [3], but no realization of continuous functioning of the sulphur cycle that produces sulphate. Ibidem, potato yield of 31.25 tones/ha was harvested against the general yield of 20 tones/ha. The review revealed that only at Project Directorate of Cropping Systems Research, Modipuram, District Meerut Uttar Pradesh, India under Indian Council of Agricultural Research, there was visualization of building up of sulphur, that too in context of burning of residues [4]. In the main rice growing areas of Thailand [5], northern China [6], Mexico [7] Bangladesh and Nepal [8] raised bed is praised as it enabled crop diversification in the low land rice fields, saving of irrigation water and increased yield. Among various manifestations of innovative application of sulphur cycle to create occurrence of aerobic decomposition of organic and cellulose, the raised bed cultivation is the most popular practice. However, researches did not visualize working of sulphur cycle and could not find scientific reason for adverse performance of the RBC in Nepal ie in one of three sites. As the use of water is low and the chemical process for arsenic As V [9] and sulphate should go aerobic, the RBC should be able to reduce uptake of AsV. So far no research had come to notice in earlier review study [10]. The RBC and many other innovative application of sulphur cycle need to be studied to bring some breakthrough in reducing problem of As.

This study has established that application of scientific fact results in devising rational experimental studies. Thus, it has indicated the shortcoming in approaches in the experimental studies in the past that resulted in variable and contradicting findings. The study has successfully demonstrated the scientific and experimental requirement of generation I (1G) studies for development of sustainable agriculture and protection of environment. It opens door and warrants studies on

optimizations of findings in support of the scientific facts of experimentations under generation I (1G). The studies on optimisation should now form experiments of generation II (2G).

***Chinampas* (Raised Beds) in Xochimilco, Mexico City:** The *chinampas* (raised beds) of Xochimilco, Mexico City are highly productive, traditional wetland agricultural systems, which were able to feed most of the population in pre-hispanic times [11]. There is a strong trend to substitute *Chinampas* with plastic greenhouses for flower production, which creates negative impacts in the landscape, environment and culture. Study compared the environmental and socio-economic sustainability of *Chinampas* and greenhouses, at both the farm and regional levels, using the MESMIS framework. Even though the results show that greenhouses are more profitable, the contribution of C*hinampas* to ecosystem services cannot be substituted by greenhouses, as tree cover is lost, canals are filled and food is not provided. Greenhouses had a higher diversity, but also a higher agrochemical use and are heavily dependent on external inputs and subsidies. *Chinampas* have shifted from staple crops to commercial horticulture in order to remain a technically viable and economically feasible option for local farmers. However, compensation mechanisms for the provision of ecosystem services are urgently needed if this ancient system is to be maintained. The framework allowed the integration of indicators at both farm and regional scales, combining on-farm surveys with GIS techniques.

Organic Farming: There has been a veritable explosion in the amount of land under certified organic cultivation in China in recent years: between 2005 and 2006, this figure jumped from 298,990 to 3,466,570ha, placing China second only to Australia in area under organic cultivation at that time [12, 13]. However, this large-scale investment in organic cultivation has been primarily oriented to lucrative export markets in Japan and the West IFOAM [14].

Chinese ecological agriculture can be described as prioritizing issues of central concern to a developing nation, particularly food security, through a pragmatic approach to technologies like chemical fertilizer and genetically modified seeds. In current Chinese usage, 'ecological agriculture' is the rough equivalent to 'sustainable agriculture' in English, connoting similar ideas of environmentally friendly production practices with similar definitional fuzziness. Now this sustainable agriculture has become the global concern.

The term 'organic' is often used in describing the farm as shorthand for a larger set of values about the relationship between humans and the environment at the site of agricultural production. Chinese believe that a substitution of labour for capital, a substitution of hoes for pesticide and machinery, lies at the heart of organic cultivation and that this substitution serves long-term soil quality and productivity [15]. Specific measures used at Little Donkey to improve soil quality include applying organic fertilizers such as manure from farm animals, prohibiting the use of all chemical pesticides and herbicides and composting. The farm employs a deep-bedded pig husbandry method that relies on native soil microorganisms to break down wastes. This method reduces pollution, conserves water and strengthens the health and resilience of the animals. The farm also raises free-range chickens. However there is lack of scientific justification in doing this practice. It has emerged due to long experience that is why it has not become global practice of universal application.

The availability of manure is diminishing as liking for keeping animals is getting reduced with time. This is visible constraint for longevity of organic agriculture. It demands some strong support of input to make the organic food production to continue.

Pro Methane Reducing Technology for Wetland Paddy: Effect of nutrient supplementations, chemical measures, irrigation and drainages practices that favour reduction of methane emission from the paddy fields and those known to enhance productivity of paddy fields are enumerated. These are the topics of current research on this subject even in 21st century [16, 17 and 18]. There has been lack of scientifically innovative approach, in general. Refinements on the mechanism of emission of methane [19], estimate of quantity from countries and use of sulphate [20] and water management [18] are the continuing approaches.

A case study on irrigation system in Philippines is enumerated to support the approach and success of irrigation method. Bohol Island, one of the largest rice-growing areas in the Visayas region of the Philippines, has experienced declining productivity and income from existing irrigation systems. The problem has been aggravated by the practice of unequal water distribution and unnecessary water use by farmers who insist on continuous flooding to irrigate their rice crop. The construction of a new dam was accompanied by a plan to implement a water-saving technology called alternate wetting and drying (AWD), developed by IRRI in cooperation with national research institutes. Visible success of AWD in pilot farms and specific training

programs for farmers have helped to dispel the wide spread misperception of possible yield losses in non flooded rice fields. Adoption of AWD facilitated improved use of irrigation water and increased rice productivity. Using the methodology of the Intergovernmental Panel on Climate Change (IPCC) [21] ie modification of water regime also can reduce methane emissions by almost 50 percent to rice produced under continuous flooding. The Bohol case is an example of new technologies that increase the income of poor farmers while decreasing GHG emissions.

Sri Method: The system of rice intensification developed in Madagasker is basically a plant physiological innovation based technology. Young seedlings of 10-12 days old are transplanted in high density, while the water submergence, fertilisers, manure and some agronomical practices are flexibly at par with the other earlier practices. Cultivation is carried out where no prolonged flooding is maintained so anaerobic decomposition is eliminated from the system [22]. The SRI method can be said on the basis of its cultivation after planting to fulfil requirement of the sulphur cycle. Since system uses compost in nursery preparation, which is prone to release methane, due to its anaerobic decomposition, it can be said that the method was not designed as per scientific basis for complete fulfilment of requirement of convening sulphur cycle for aerobic decomposition. Therefore, application of aerobically decomposed composts will make it a true scientific fact based method of universal application for rice cultivation for bringing sustainable agriculture and protection of environment. Nevertheless, yield potential is to be contrasted with that of flooded rice cultivation in low land condition.

Water regime is not the issue that has been researched upon. And so was the issue of methane release. The yields have increased due to prolonged growing period and high density/ exhaustive tillering. This is not a complete green technology. Yadav (2012) [10] made suitable recommendation to make the SRI a green technology of paddy cultivation.

Legume Technologies to Improve Soil Fertility: Results from a study exploring the reasons for low adoption of legume technologies to improve soil fertility by farmers from a community in central Malawi who took part in participatory trials are described [23]. This study explores the influence of gender roles in agriculture and land ownership and socio-economic differentiation in the community. Because most women do not own land and are traditionally responsible for legume crops, they have little interest in managing soil fertility for maize crops. Men are not interested in using legumes in maize-cropping systems. Some are too poor: this group needs to complement their subsistence maize production with paid labour on the farms of better-off farmers; restricting the labour availability for their own farming activities. Wealthier farmers have access to and prefer to use chemical fertilizer and cattle manure. Take-up rates among the middle group of farmers were also low. This study discusses how these (and other) factors influence the (non-) adoption of maize-legume technologies in Malawi and the effectiveness of participatory research. It emphasizes how differentiated farmer-realities affect the uptake of technologies identified as promising in participatory field evaluations. Although the legume based nutrient build up is very important but entire concept of application of is unscientific. It requires integrated nutrient management for enhancing productivity. The concern for environment protection is beyond imagination here. Hence, it needs overall revamping of agriculture to make food production sustainable and practicing green agricultural technology.

Little Donkey- a Community Supported Agriculture (CSA) of China: Little Donkey Farm is located in the northwest corner of Beijing's Haidian District at the foot of Fenhuangling Mountain. Founded in 2008, the farm is an agricultural project carried out on experimental production land jointly established by the Renmin University School of Agricultural Economics and Rural Development (SARD), which all the authors were affiliated with), the Renmin University Rural Reconstruction Center and the Haidian District government. Little Donkey operates on 37 acres of farmland just outside the suburban village of Houshajian. The farm's soil and water resources have been assessed by an independent professional organization and meet the necessary standards for organic production. The farm's land includes fields, pasture and trees; farm operators have tried to ensure that the agro-ecosystem is ecologically balanced and biodiverse, creating a materials cycle through integrated cultivation and husbandry.

The authors were involved in the farm's inception, organization and operation. In 2008, Shi Yan, currently the farm's chief operator, travelled to Madison, Minnesota under the auspices of the Minneapolis-based Institute for Agriculture and Trade Policy to work as an intern at Earthrise Farm, a small organic CSA farm. Her experiences in the American Midwest informed decision making about the organization and structure of

the Little Donkey project upon her return to Beijing: the operating models she observed and participated in Minnesota seemed practically and fruitfully translatable to peri-urban Beijing.

Community Supported Agriculture (CSA) Mc Fahem (2004) [24] is a term for farm operating models based on concepts of community and shared risk. In the basic CSA model, members pay for a share in a farm's produce before the growing season begins and then periodically receive fresh produce as the season progresses and crops are harvested. Farmers are able to access operating capital up-front; CSA members help shoulder some of the risk inherent in agricultural production and a notional community are constructed around the farm through membership. A CSA-style direct purchasing system known as *teikei*, meaning 'cooperation', was independently pioneered by a group of Japanese housewives in the mid-1960s.

Little Donkey Farm is the first farm in the greater Beijing area and one of the first in mainland China, to use a CSA operating model. Cultivation at the farm follows a programme of non-chemical agriculture designed to improve soil health and agro-ecosystem well-being. This programme borrows knowledge and techniques from traditional local farming practice; permaculture systems; the 'Natural Farming' system developed by South Korean master farmer Cho Han Kyu; and Shi Yan's experience with organic farming in the USA.

Little Donkey has not undergone organic certification, due in part to the expense and complexity of the process, but also in part to widespread mistrust of food labelling schemes among Chinese consumers. Instead, the farm relies on informal, participatory 'certification': a good reputation gradually established through word-of-mouth among CSA members, other local farmers and regular consumers. Little Donkey is completely open to visitors and the ongoing presence of many different actors, including local villagers, college interns, interested consumers, reporters and NGO representatives, serves as both sign and guarantee of the diverse channels of trust accessed by the farm.

Farm workers at Little Donkey include local peasants and interns. Daily cultivation management at Little Donkey is largely the responsibility of local peasants hired by the farm. Interns, often recent college graduates, apply for the year-long position on the farm to learn about sustainable agriculture and experience life in an 'alternative' community of like-minded people. Service management is primarily the responsibility of Little Donkey administrators and interns and includes tasks such as delivering shares, writing regular newsletters and communicating with members. The weekend is the most popular time for working-share members to work on their plots and for city residents to visit the farm. Little Donkey has been remarkably successful thus far: the farm has been running smoothly for more than two seasons; members are enthusiastic; participation is growing; and the project's visibility, following a wave of media attention, has helped raise the profile of sustainable farming in Beijing. 'Little Donkey' has become a recognizable brand: even learned of a farm using the Little Donkey logo and name in Inner Mongolia.

Viewed in context, the farm's success is intimately connected to changes in Beijing's socioeconomic landscape. With rising per-capita incomes, the relative percentage of income allocated by consumers to basic expenditures has decreased even as absolute per-capita expenditures have increased. Consumers have more money available to spend on food, expanded discretionary income and a growing awareness of health and environmental issues associated with food production. A project like Little Donkey Farm is made possible within the set of social and economic circumstances producing and produced (Zhang 2005) [25] by an expanding (urban) middle class.

Waterhed Managemet Practices in India: In India extensive research on watershed management started in 1984 and it has acquired several modifications in the format. The watershed management proved to be very scientific endeavour to support resources conservation and creation of avenues for food, fuel, fibre and fodder production which serves basic resources utilisation. Variety of cultural, conservation technologies are followed as in case of general agriculture. There could be a unique practice of agriculture, designated as racy nature agriculture for all watersheds. This will enable unique technology to produce enormous wealth to produce global prosperity and protection of environment. The racy nature agriculture is crystallised science to replace the vague science of agriculture practiced in the watershed management projects.

MATERIALS AND METHODS

Enhancement in Yields and Food Characteristics: The practices have been selected to enhance yield. The racy nature agriculture, being convergence of most effective practices such as, ploughing, manuring, bed preparation, planting, irrigation, weeding, inter culture, harvesting and post harvest cultivations were validated by adopting published research results.

Table 2: GHG emission by energy inputs in application of components and their functions.

		GHG emission, by the technology		GHG emission by component practices	
S.No	Treatment	Control	Racy nature agriculture	Control	Racy nature agriculture
T1	Field preparation	100	50	100	-
T2	Aerobically decomposed	50	10	100	-
T3	Planting field bed preparation	50	70	100	-
T4	High density plantation	100	100	100	-
T5	Sprinkler irrigation	10	10	-	-
T6	Weed control	12	15	100	-
T7	Inter culture	25	10	100	-
T8	Harvesting	20	20	100	100
T9	Next season cropping	25	-	100	10
	Total	382	285	800	110
	Racy% against control	100	75	100	14

Table 3: Designated performance indicators

S.No	Characteristics	Indices assigned
1	Endure to withstand the global warming and climate change.-	Endurance
2	Linkage people, agriculture and environment.	Linkage
3	Charter of agriculture for food security with environment protection-	Food security
4	It makes best use of present situation and conserves resources for posterity. Present and Posterity	Presenpost
5	Universal applicable for all ecosystems, soils, crops, water qualities and irrigated as well as rainfed agriculture.	Universal
6	The technology premise use for developing new practices for horticulture, forestry and agro forestry.	Premisadaptivab
7	Development of quality of primary produces of food, fodder and food chain Qualityimprovement	Quimp
8	Enhancing of nutrient, moisture and other resources use efficiency-Efficient resource conservation.	Erescons
9	Making use of known primary and perspective secondary natural resources.	Priscons
10	Surpassing and overtaking all previous practices of agriculture.	Technosurpass
11	Capability to bringing further improvements in best claimed innovative practices.	Correctcapability
12	Enabling devise technological innovations for creating lively hood (Jeevika), by making flexible multi story use of space and time.	Livelihood creation
13	New tools and machineries for implementation.	TPneed
14	Inheritance to compensating resilience to follow up, even on middle paths of partial application of the technology, to enable all stake holders to join and become part of mission of building global mansion of sustainable food security.	Adoptresili
15	Introduction of service sector to enhance national GDP Service sector	GDP Prom
16	Social security	Socialsecur
17	Green technology	Greentech

Reduction in GHGs

By the Component Application Practices: There are two aspects of GHG emissions. The first category of emission is with the energy in put involved in implementation of the practices operations. Practices such as composting, land preparation etc under control are large volume of GHG emitters. The component of racy nature agriculture only the raised bed preparation is high energy input work that will involve release of GHG volume. The GHG release by the improved and control as it regards to components are as relative values against usual control values. The practices which are enumerated have not been devised to reduce the GHG emissions. Hence these are in the category of control. Several researches have quantified the component wise GHG emission. However, the effort on performance based GHG emissions have been verified in some experimental studies. Those levels (Table 2) can be taken as reference level and rating adopted for evaluation of performances are as percent of the GHG emission under the control condition. The reduction of GHG by the component indicative values are those that are expected to occur under the control and against it are the values with racy nature agriculture.

Indices for Performance Based Indices: New agricultural systems that are able to confront the challenges of a rapidly changing world require a minimum of ten attributes that constitute the defining elements of a Green Agriculture. A major challenge is to identify a set of thresholds that any agricultural production strategy must meet, beyond which unsustainable trends caused by the farming technologies would lead to tipping-point phenomena. In contrast with the general contentious the racy nature agriculture set and accomplishes 17

challenges thus it surpassed the basic indices assumed to act as indicators. These indices are characterised and suitably coded for appraisal and referencing (Table 3). These indices are evaluated for the technology as against the innovative scientific fact based nature agriculture.

Based on the basic emphasis and character of the prevalent technologies from east to west across the globe are drawn in Table 4. These indices are performance evaluation for the technology to be sustainable, environment conserving and producer of green food.

The agricultural technologies the agricultural technologies have been based on trial of the natural phenomena and subsequent refinements. There has been lack of scientific approach that resulted in highly variable practices which get justified on the plea of variation of climate, soil, water etc. There has been no basic innovation of universal nature. Under this situation the Racy nature agriculture is a universally applicable scientifically based innovative technology.

RESULTS

Yield Increases

Crop Yield Increase Due to Various Factors: Individual practices have been extensively researched upon. Conservative values are adopted as crop yield increase level. Crop yield responses are converted by additive and multiplicative indices in Table 5.

Composite Technology Validation: The study by Gill *et al*. [26] was for sub soil management. The treatment of ripping, in 1.7 m wide raised bed at 80 cm apart was carried out and amendments were added through 15 cm mole pipes. The crops were sown at 20 cm across slope and plant to plant spacing 7 cm in no Lucerne and Lucerne land use condition. The treatments which are parallel to the treatment of Racy nature agriculture are presented in Table 6. The land treatment of ripping alone has some beneficial effect at no Lucerne site but no beneficial effect in Lucerne previous land use.

Among the subsoil amendments the dynamic lifter proved to be the most effective in increasing grain yield and the protein content reflecting nitrogen use efficiency. Under the Lucerne land use site the ripping had no effect; the use of Lucerne was effective over other sub surface treatments on increasing yield of treatments. The N use efficiency was the maximum with subsurface treatments with MAP/sulphate giving the beneficial effect. Since the Racy nature agriculture treatments are applied for every crop, yield results of first year is taken for corroborating results composite validation. The sub soil management technology oriented treatment measures are compared. Since the experiment comprised raised bed configuration, this provided opportunity for getting feel of the potential of enhancement in yield and N use efficiency. There is good response of practices composing Racy nature agriculture. Although the practices applied in the study are far different objective and niche of application of treatments, it gave sufficient indication of effectiveness of Racy nature agriculture.

The treatments tried by Gill *et al*. [26] are very suitable for enhancing productivity of forestry and agro forestry. Deep placements of sulphate i.e. gypsum could be retained as sulphate to produce beneficial effect to trees. It could also be harmful if converted in to hydrogen sulphide. There can be some innovative way to promote aeration in the subsoil to convene aerobic decomposition.

Yield Increases Composite Technology: Using the crop yield indices crops enhanced yield levels are estimated (Table 7). As there existed considerable difference between yields estimated by the additive and multiplicative models, an average of the two yield levels were made and adopted for further comparison of the cropping sequences.

Some Yield Records: Some known harvested yields are tabulated which are claimed to be big achievement. Take the case of potato; recorded yield was almost one and a half times the general yield. Under the Racy nature agriculture with recommended capsule of practices yield of almost double of the present yield will be possible. There will be saving in the water for irrigation as well. Likewise, the general yield of rice is 60q/ha, which, can be increased to almost double the present yield. However, reported from Bihar yield of rice is almost four times the present yield. The reported level was refuted by a Chinese Scientist [27] to be overestimated by 120 percent. However, this refutable yield was said to be authenticated by the Government officials. The Racy nature agriculture is in some way supporting the achievable yield of rice to be double instead of four times. It goes parallel to the estimate made by the Chinese scientist. The Chinese scientist opined out that such high yields can be possible where soil condition is good. In the Racy nature agriculture the soil condition is improved by raised bed furrow system which improves nutrient and moisture reserve available for crops. Additionally, nutrient supplementation is created by the scientifically innovative practice of NADEPED GM Yadav (2012) [10].

Table 4: Very conservative assessment of yield enhancement by Racy nature Agriculture practices components

S.no	Racy nature agriculture practice component	Possible increase,%
1	Aerobically decomposed manure, application	15
2	Ploughing	5
3	Formation of raised bed furrow system	10
4	Precision sowing	5
5	Maintenance of optimum plant density	10
6	Sprinkler irrigation at optimum efficiency	10
7	Weeding	5
8	Inter culture	10
9	Subsequent cropping system	5
	Composite enhancement additive index	75
	Multiplicative index	2.047

Table 5: Effect of composite technology on enhancement in grain yield and nitrogen use Efficiency, Gill *et al*. [26]

S.N0.	Practice	Yield, T/ha	% increase	Grain protein, mg. g^{-1}	%
	No lucern site, 2006				
1	Control	3.6	17	108	2.8
2	Deep ripping	4.2		111	
	Organic amendment (Subsoil and organic amendment				
3	Dynamic lifter	5.6	56	146	35
4	Lucerne pillet	6.5	81	139	29
5	MAP/gypsum	5.3	47	143	32
	Composite factor	Additive	163		
		Multiplicative	138		
	Lucerne Site,2006				
1	Control	3.6	17	96	0
2	Deep ripping	4.2		96	
	Organic amendment (Subsoil and organic amendment				
3	Dynamic lifter	3.0	-	108	13
4	Lucerne pillet	2.9	-	123	28
5	MAP/gypsum	3.1	-	141	47
	Comp site factor Dynamic lifter/MAP, Gypsum	Additive	113/147		
		Multiplicative	113/147		

Table 6: Enhancement in crop yield by Racy nature agriculture

		Enhancement in yield, factor		Increase in yield ,q/ha		Crop yield, q/ha		
S. no	Base yield, q/ha	1.75	2.047	75	2.047	75	2.047	Accepted yield, q/ha
Wheat	40	75	2.07	30	43	70	83	76
Rice	60	75	2.07	45	64	105	124	114
Maize	50	75	2.07	28	54	78	104	91
Pearl millet	22	75	2.07	17	24	39	46	43
Mustard	18	75	2.07	14	22	32	40	36
Soybean	26	75	2.07	20	28	46	54	50
Gram	24	75	2.07	18	26	42	50	46
Pigeon pea	20	75	2.07	15	32	35	52	44
Potato	200	75	2.07	150	210	350	410	380

Table 7: Some recorded yields

Crops	Yields, q/ha				
	General	Recorded	Expected under Racy nature agriculture	Technology gap/supplementation	Reference
Potato	200	313	380	NADEPED, irrigation, inter-culture	Narsimha Murthy, K. 2012. Innovative farming gives unexpected high yield Daccan Herald News service, DHNS.[3]
Rice	60	220	114	Do	Indians harvest claims 120% fake Claims Chinese scientist Hindustan Times Mumbai, Feb 22, 2013 [27]

Fig. 5:

Table 8: Paradigm shift- Case study of Punjab Agriculture

S.No	Crop	Present,q/ha		Racy nature Agriculture	
		PS	REY	2G	REY
1	Paddy	60	60	114	114
2	Wheat	40	30	76	57
3	Maize	50	31	91	57
4	Mustard	18	37	36	76

PS present status; REY Rice equivalent yield.

Price of commodity, Rs/q: Wheat 1200; Rice 1600; Maize 1000; Mustard 3300; Soya bean 2000; Gram 4000

Further, implementation of the Racy nature agriculture will help testify to establish and support/ improve the would be coming high yield levels in future, for example, as reported by the farmer in Bihar.

The capsule of Racy nature agriculture will be an antidote under all soil, crop, climate, rainfed and irrigated situation. Local customization will indicate scope where improvement in agriculture can be focussed. This will open a frontier of scientific resources management. Thus, new niche of productivity plateau can be established for global production. The entire activity will need overhaul to bring the scientific nature agriculture. It is apparent that world food situation will bloom from scenario of gloom. It needs make up of mind to implement in rejuvenating agriculture for global food production.

Fig. 5. Sprinkler irrigated wheat crop shows uniform stand at CIAE Bhopal Research farm. The Racy nature agriculture, encompassing raised bed configuration and sprinkler irrigation, enabling applying furrow irrigation during tillering and grain filling, will further induce vertical growth of the wheat crop to establish new niche of yield. Other components of the Racy nature agriculture and advantages of the technology are enumerated in Table 8.

Yearly Cropping Sequence Yield Based REY: The annual crops are put in different cropping sequences and their composite REY were assessed (Table 9). These values guide one as to which cropping sequence should be followed in a given situation. This will help decide customised management of nature agriculture.

Table 9: Year wise cropping sequences and rice equivalent yields (REYs) after Racy Nature agriculture

Items	Crops		
Crops	Rainy season	Winter season	Total, q/ha
	Cropping sequence, Rice--wheat		
Crops	Rice	Wheat	
Yields q/ha	114	76	
REY	114	57	171
	Cropping sequence Maize -wheat		
Crops	Maize	Wheat	
Yields, q/ha	91	76	
REY	57	57	114
	Cropping sequence Maize- Mustard		
Crops	Maize	Mustard	
Yields, q/ha	91	36	
REY	57	74	131
	Cropping sequence Soyabean -wheat		
Crops	Soyabean	Wheat	
Yield, q/ha	50	76	
REY	63	57	120
	Cropping sequence Maize- gram		
Crops	Maize	Gram	
Yields, q/ha	91	46	
REY	57	115	172

Price of commodity, Rs/q: Wheat 1200; Rice 1600; Maize 1000; Mustard 3300; Soyabean 2000; Gram 4000

The outcome will be better and efficient use of resources in agriculture. The REYs will create new niche in food production. The customised data will guide on formation of policy tools and governance to be promoted in different agro-eco regions. Likewise, the quality of the food produced in Racy Nature Agriculture will get identified for GIr and Quality patenting. This will help consumers select most genuine and desirable food for purchase and the producers get remunerative price. This situation will enhance the GDP in agriculture and further improve agriculture to become more live, smart and enthusiastic in due course of time. The primary productivity will give base for industrialisation in agriculture and increase in employment opportunities.

The bar chart depicts status of practice and its technological advancement on increasing yield of a preferred cropping pattern and its alternative in the state of Punjab. The present day agriculture of practice had induced water crisis in Punjab ET, (2013) [28] but the Racy nature agriculture will be able to enhance yield to almost double the level and it will conserve water and nutrient. Change is being focussed by inter-ministerial panel to look beyond paddy that guzzles water. The Racy nature agriculture will come to eliminate the bad situation and improve production with resources conservation. The Nature agriculture capsule will be suitable for rainfed and irrigated agriculture. Even if the paradigm shift is introduced there to Racy nature agriculture will bring

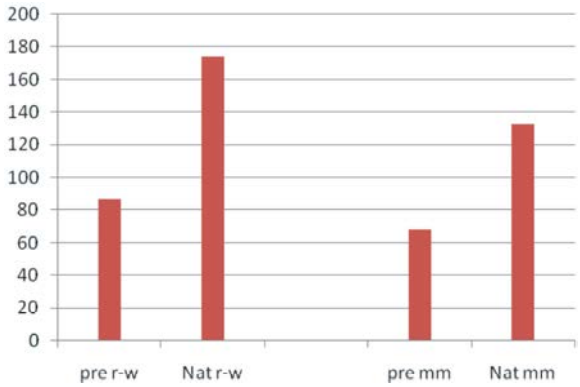

Fig. 6: REY of Paddy wheat and Maize mustard yields of present day agriculture and Under Racy nature agriculture

(Note: r-w: rice –wheat, mm: maize- mustard)

improvement in the yield. Thus, there is need to implement the science based technology capsule in Punjab and everywhere in the world to bring enhanced sustainable global production.

GHG Emission: Table 2 contains the GHG emission in implementation of technology component in the field against control as well as on the emission by individual components. Several researchers have accounted the quantum of GHG emission in work needed to implement the practices. Hardly there has been visualisation of

Table 10: The performance of indices across paddy technologies

		The known technologies									
	The indices	Racy Natu	RBC	Chinampas	Organic	Legumenitrogen	Malawi SRI	IrrigAWD	Little Donkey project		Watershed management project of India
1	Endurance	*	+						*		*
2	Linkage	*	*	*	*	*	*	*	*		*
3	Food security	*	*	*	*	*	*	*	*		*
4	Presenpost	*									
5	Universalaplic	*	*	*							*
6	Premisadaptivab	*									
7	Quimp	*		*	*	*		*	*		*
8	Eriscons	*	*	*	*	*	*	*	*		*
9	Primariseco	*									
10	Technosurpass	*	*	*							
11	Correctcapability	*									
12	Livelihood creation	*	*	*	*	*	*	*	*		*
13	TPneed	*	*								
14	Adoptresili	*				*			*		*
15	GDP Prom	*	*	*		*			*		*
17	Social security	*	*	*	*	*	*	*	*		*
17	Green tech	*	*	*		*					
	Efficiency score	17	10	11	7	9	5	6	9		10
	%	100	59	65	41	53	29	35	53		59

+The blank boxes imply that either information is not known, not clear or does not apply.

detailed component wise assessment of GHG emission. The technology implementation GHG emission by the racy nature agriculture to control is 75: 100. Similarly, the component wise GHG emission level is 14:100, respectively.

Technology Performance

Endurance: Among several practices the racy nature agriculture, little donkey project of china and watershed management have capacity to endure adverse impact of drought. These technologies acquire capacity to produce food even under drought.

Linkage: All practices of agriculture have some links with environment. Most of them have adverse effect. Among other technologies the organic farming is known to produce maximum volume of methane.

Food Security: All agricultural technologies produce food hence they are considered to qualify criteria of impact assessment of food security. Nevertheless, there can be variations on the levels of food security among themselves. The productivity enhancement capability of racy nature agriculture is highly effective in producing sustainable food security; hence, it has highest merit in this category of impact factor.

Presenpost: The present and posterity welfare development conscious practice again on the top of the list of known technologies. Because of its functioning in the cyclic farm it maintains a nonstop endless chain of functioning. It controls impurities of by-products and processes to keep always functional and refined. Hence it safeguards present and future. This is the only practice to have such necessary characteristics of agriculture technologies.

Universality: Because of its fundamental constitution it is universally applicable for all climate, agro ecosystems, soil, crops, cropping patterns and rain fed as well as irrigated. It is only one technology in its category to be universally applicable for entire domain of agriculture in the entire global scenario, including poly and green house controlled environment agriculture. It inherits component importance index value to take care of site customisation.

Premisadaptive: The premises of racy nature agriculture are useable in devising nature horticulture, forestry and agro forestry. Set of practices are developed on the parallel lines of racy nature agriculture, which are universally applicable.

Table 11: Elemental composition of organic manures (average values Biswas *et al*. [29]

	Macronutrients			Some selected heavy metals			
	N	P	K	Fe	Mn	Cu	Zn
Organic manures	% wet weight basis			Mg/kg dry wieght basis			
Farm yard manure	0.54	0.31	0.51	440	155	10	78
NADEP	0.93	0.52	1.15	215	96	25	56
Vermin compost	1.36	0.48	0.65	619	245	16	45

Note there was no visualisation of building of S sulphur in the organic manures, supporting lack of visualisation of working of sulphur cycle

Quimp: Many countries are known to have fascination for organically produced food. The inherited cultivation practices of organic food production include GHG free operations by the agricultural machineries and tools, no use of pesticides etc that might impair the quality of produce. But, there is no guarantee of controlling movement of heavy metals, toxic gases from the water and the soil and environment where the organic food would be grown. As an example the content of such metals are enumerated here to display the risk of poor quality of organic agriculture.

The manure characteristics will have important bearing on the quality of organically produced foods. Here in the racy nature agriculture it contains inbuilt mechanism of auto regulation of intake by plants, reduction of impurities of the medium of production including environment and refinement of situations by stabilization of heavy metals etc. Hence it produces food superior to that by organic food. Further, in the developing scarcity of dung, the basic input of organic agriculture, the racy nature agriculture having no such limitation and better quality content, is a unique agriculture technology for producing good quality sufficient food for all global consumers.

Eriscons: The racy nature agrioculture has inheritedly built in mechanism that enhances efficiency of resources land, water and nutrient input in agriculture. In the developing scarcity of per capita availability of land, water volume, natural resources this is technology which will save globe from the disaster of food shortages under the changing scenario of climate change and global warming.

Primariseco: This is the only technology which is devised based on the scientific principles and capable of producing secondary natural resources in agriculture. So far scientist have produced research knowledge of chemistry of nutrients both macro and micro in crops and fields but, no visualization existed to manoeuvre the secondary natural resources produced by the interaction of water and environment. Previous studies on this topic by this author have sufficiently substantiated and documented [10, 30].

Technosurpass: The racy nature agriculture, which encompasses morphological feature of bed transformation similar to that of RBC and the *Chinampas*, has many aspects superior to those added in it. Therefore, it surpasses all globally known practices of agriculture.

Correctcapability: Since racy nature agriculture is based on sound scientific and engineering principle it has capability to produce result even without carrying out field experiments based on trial and error i.e. black box approach. With that capability this technology is able to pin down lacunae in the best known technologies. For example, it made valuable improvement in the SRI and RBC. In order to facilitate the global agriculture and protection of environment it has brought out several reformations of green manuring, a prominently known practice of input of organic nutrient in agriculture. Some corrections are listed for best claimed breakthrough in India as publicised by ICAR News to make them scientifically true green practice.

There are many lacunae in the existing general and claimed innovative practices getting prominence in Indian agriculture in particular and world over in general. The discrepancies and needed improvements are suggested for various practices as shown in table 12. Nevertheless, even after the improvement these practices cannot compete with those encompassed in the racy nature agriculture.

Livelihood Creation: In the recent years there have been lot of emphasis in India by different state, through international development funds to launch technologies to promote livelihood (*Jeevika*). Each one is devising practices and programmes as per individual wisdom, where results will come after some years of practice.

Table 12: Suggested improvement in the existing partially faulty practices

S.No	Practice	Discrepancy	Improvement
1	System of rice intensification (SRI)	It emits methane due to anaerobic condition in submerged field. There is nothing else than dense planting of 10 days old tender seedling	Aerobically composted manure or the Aerobically decomposed green manure should be used at least 20 days ahead of both nurseries raising and transplanting.
2	System of rice intensification SRI	It does not improve bed condition in any way to support nutrient and moisture supply.	Adopt Racy nature agriculture capsule.
3	Compost	Pit composting is less efficient and releases methane to the atmosphere	Adopt Aerobically decomposition method of composting
4	Green manuring in submerged paddy	It releases methane to the atmosphere and effect on increasing yield is short lived i.e. limited to the accompanying crop. Nitrogen loss with runoff water leads eutrophication of water bodies	Replace by the aerobically decomposed green manure
5	Zero tillage for wheat after paddy in paddy wheat cropping sequence	It fails to convene aerobic decomposition hence it does not make use of secondary natural resource.	Adopt Racy nature agriculture capsule.
6	Zero energy input based composted substrate for mushroom production	Ideal condition to convene aerobic decomposition not achieved. No display of scientific knowledge of decomposition.	Adopt Racy nature agriculture capsule. Still better method can be designed and productivity enhanced.
7	Ridge and furrow method for increasing water use efficiency	This is not the best. There is still better method to increase water use efficiency	Follow capsule of Racy nature agriculture
8	Cropping management factor C	The practices are faulty. The research effort is futile.	Adopt innovative practice of Racy nature agriculture and revise experimental design to evaluate new cropping management factor C.

Relative merits of the practices will come in due course of time, but then lot of efforts, resources and enthusiasm will get exhausted. The racy nature agriculture is sufficiently equipped to promote that livelihood efficiently. It enables one to select best practice that will be highly efficient and remunerative and sustainable in bringing one, double and multi story agriculture system deemed to supplement the livelihood.

Tpneed: The racy nature agriculture encompasses RBC which requires tools and plants for preparation of organic nutrients, bed configuration, precision seeding/ planting, sprinkler irrigation, weeding, inter culture, harvesting, post harvest preparation and following cropping. There are no specialised already existing tools and plants, which require research and development globally. Since, there was no visualization of such unique developments to come in agriculture, no research and developments have gone in. It requires new developments for plant and machinery requirement of racy nature agriculture. It opens new industrialization need in agriculture and environment protection.

Adoptresili: Some technologies viz, RBC, *Chinampas*, SRI and AWD have no resilience of giving suitable results for agriculture and environment, if there are shortfalls in their applications. The racy nature agriculture is inherited with technology application resilience. All components when applied will produce some benefits. It has sole as well as combined alternative such as under light irrigation demand sprinkler irrigation will be sufficient for rainy season supplementary irrigation for most of crops. Water demand of aerobic rice will be high during the stage of tillering and booting stage. During these stages irrigation water should be applied by over irrigating furrow irrigation. At this stage surface irrigation should prove better than sprinkler irrigation. Similar approach should be followed for wheat cultivation during winter season. This mode of irrigation water management is the best practice of technology application. There is flexibility of application of the component precise application of the listed practices will produce proportionate benefits.

GDP Prom: It has been seen in the recent years that inclusion of service sector enhances GDP of national economies in the countries world over. Racy nature agriculture has some specialised aspects in its implementation, which may need skill. There is very good scope for the bringing service sector in agriculture by adopting racy nature agriculture.Yadav and Yadav [30] have dealt with need and prospects of the business process out sourcing for the racy nature agriculture. The BPOs will also indirectly work as extension agents for the racy nature agriculture.

Table 13: Hall mark requirement and fulfilment of green technology by racy nature agriculture

Factor consideration	As applicable for green building*	As applicable for fulfilment by racy nature agriculture
Environmental benefits	GHGs emission reduction	Eliminates to maximum possible extent
	Conserve and restore natural resources	It conserves and enhances use efficiency of physical resources and primary and secondary natural resources
	Storm water management	It encompasses compensatory storm water management technology
	Waste reduction	It converts wastes in to essential nutrients
	Enhance and protect bio diversity and ecosystems	It is applicable to all ecosystems to enhance its bio diversity
	Improve air and water quality	It improves air and water quality of food production
Economic benefits	Energy and water saving	It saves energy and water
	Increased property values	It increases land value and yield levels
	Decreased infrastructure strain	It decreases soil, water and nutrient degradation
	Improve employee attendance	It improves working condition from mud to walk able condition and working environment.
	Increased occupant productivity	It enhances productivity of land and agricultural work force.
	Sales improvement	Quality improvement will go in this direction
	Reduce operating costs	It reduces operation costs, in many respects.
	Optimise life cycle economic performance	It takes at least yearly cycle of operation
Social benefits	Improved health	It improve food quality and food chain necessary for good health
	Improved resources use	It improves water and environment interactions
	Heighten aesthetic quality	It encompasses clean and green agriculture
	Minimise strain on local infrastructure	It does not erode and degrade soil, air and water.
	Improve overall quality of life	It improves overall quality and quantity of food
Disadvantage	Non green building	Non green agriculture
	39 percent of total energy use is wasted	Wastage is even more; to be assessed
	12% of total water consumption is excessive	Will be more; to be assessed
	68% of total energy consumption	Will be more; to be assessed
	38 % of total CO_2 emission	Will be more; to be assessed

[31]*Economic Times 2013. Nagpur Real State vision 2020. The Economic Times. New Delhi, Tuesday April 9. pp15.

Social Security: All agricultural technology produce food which is basic need thereby produce social security. However, depending on their ability the level of social security will be different. For an example the *Chnampas* are getting replaced by the beneficiary as there are other alternatives to produce economical return. There is need to employ subsidies or compensations for keeping the *Cinampas* to continue to maintain the social security. The racy nature agriculture is very capable of producing social security of food, environment, lively hood and contented citizenry.

Green Tech of Irrigation Management: RBC, *Chinampas* and leguminous of Malawi and irrigation AWD are some way partially green technologies. The racy nature agriculture is totally green technology. Its contributory characteristics are given in the following.

The Racy nature agriculture fulfils all the challenges of green agriculture technology. These days there is strong move to bring green building concept in the real state (Economic Times, 2013). There is such movement in agriculture also, but, ideas are not very crystal clear about what to do. Thus, there has been no quick break through. The Racy nature agriculture is a breakthrough not only for one aspect, but in the entire domain of global food production. It has very strong justifiable scientific base and will stand any debate and criticism to support its merit. Its initiative in research will produce data on resources conservation against present day agriculture.

The overall scenario of performance evaluation the racy nature agriculture is ideal as it scores cent percent needed performance. Following this is the *Chinampa*s of Mexico securing 65 % at level II and RBC and watershed management both securing 59 % are at level III. SRI and AWD are the lowest most scorers in terms of the performance indicated by 17 aspects in this study.

Complete Arrest of GHGs to Overcome Global Warming and Avert Climate Change and Arrest of Pollution Intakes by the Crops: The Racy nature agricultural technology encompasses aerobic decomposition process that produces CO_2 in place of CH_4. It is known that CO_2 has warming potential (GWP) 1 and methane CH_4 of 23. Further, the racy nature agriculture comprises measures to remove inimical products that emerge in the decomposition process or already existed in soil or water.

Table 14: Immobilisation of Cd, Cu and Pb in different soil by bio char amendment the lowest level up to which concentration was reduced

Soil	Treatment	Cd, mgkg^{-1}	Cu, mg.kg^{-1}	Pb, mgkg^{-1}
AH, spiked soil	Soil	0.955	0.55	11.3
	Soil+CM	0.16+-0.0283		0.727
	Soil+ GW		0.4424+-0.0136	
SR, shooting range soil	Soil			
	Soil+CM	0.101+-0.00153		
	Soil+GW			
KC, copper contaminated mine soil	Soil			
	Soil+CM		47.6+-16.9	
	Soil +GW			

CM chicken manure, GW green waste derived biochar, both chars added 5%.

Table 15: PH and microbial activity of chicken manure and green biomass manure biochar amended soil, mean of three replication of highest values.

Treatments	$_{P}$H	Respiration mg CO^2 kg-1h^{-1}	DHA, mg TPF kg-1 2 h^{-1}
S			
SMC1			
SMC5			
SMC15	7.51	3.760	8.96
SGW1			2.91
SGW5			
SGW15	6.35	2.484	

The measures convene process of adsorption of heavy metals and absorption of harmful gases such as methane etc that come in contact. Thus, release of GHGs viz CH_4 is eliminated to large extent. Chicken manure developed bio-char was more effective in both the immobilisation of metal and increasing plant growth than green waste derived bio-char. The chicken manure derived bio-char dramatically reduced NH_4NO_3 extractable Cd and Pb concentration from 0.95 and 11.3mg kg^{-1} to 0.11 (88.4%) and 0. 73 (93.5%)mg kg^{-1}, respectively. However, the Cu concentration increased in chicken manure amended soil in the low Cu concentrated soil. When the soil had high Cu concentration the chicken manure significantly reduced Cu concentration. Green biomass char was also effective in immobilising Cd, Cu and Pb, but to lesser extent than the chicken manure.

The utility of bio char on stabilization and reduction of uptake by plant is substantiated by quoting report of study by Jin *et al*. [32] Results showed that bio-chars have potential to significantly affect the behaviour of metal in soils by altering their solubility, availability, transport and spatial distribution.

The information referred to here amply proves that application of environmental principle of adsorption and absorption is applicable in the racy nature agriculture. The trend could be established by application of scientific principle which could be achieved by experimental study. The scientifically derived results can be optimised for selectivity.

Endurance to Withstand Global Warming and Climate Change: Global warming due to accumulation of green house gases emitted by natural and geogenic sources have become a worldwide concern. The global warming is experienced to induce climate change, which will have direct bearing on water resources, agriculture, yield reductions, increase in cost of food commodities and socio-political instability world over. The hydrological impact of global warming and climate change will be in the form of magnification of extremes of droughts and floods and aberrations in the setting of cropping seasons. In the Racy nature agriculture technology the raised bed and furrow carved at mild slope will have compensatory action to moderate adverse impacts of drought and floods. During drought large build up of nutrient and moisture will support crops and during prolonged water logging situation it will provide drainage and aeration to the crop on the raised bed. Under both the situation of droughts and floods the secondary natural resources that will emerge due to chemical reaction involved in aerobic decompositions, i.e. working of sulphur cycle will enhance the nutrient and water resources use efficiency. These facts about the Racy nature agriculture will make it withstand the global warming and climate change. It is already established that the Racy nature Agriculture will eliminate the GHGs emission to atmosphere; hence it will produce purious effect on reducing adverse impact of global warming and climate change.

The Technology Two Arms Contrast: The agricultural technologies can be broadly classified as crop variety improvement and cultural improvement including irrigation and nutrient management. The variety improvements can be imported and transferred from one country to the other. There has been good advancement in development of dwarf varieties of wheat and rice that brought green revolution worldwide. Dr Norman Borlaug was awarded noble peace prize for bringing this breakthrough. The World Food cash PrizeUD$250,000 for 2013 was awarded to some pioneers of new genetics who have opened up opportunity for achieving a balance between human numbers and the human capacity to produce adequate food [33]. It was claimed that genetically engineered crop can feed a projected nine billion people by 2050. However in 17 years the GM seed companies have not gone beyond a 4 percent area globally. Even this has been in case crops namely, cotton, corn, canola and soya bean which predominantly only have no food uses and do not contribute to food security. It was a prize from Monsanto to Monsanto because they are one of sponsors, said an NGO on the basis that the technology has not been accepted by many nations. The World Food prize Foundation said that work of the three scientists from the biotechnological research (involving insertion of foreign gene s in to plants) had led to the development of a host of high yielding and pest resistant GM crops. However, such remarkable technological breakthroughs have not emerged in the domain of cultural practices, i.e. other arm of agriculture for food production.

The developed arm of the agriculture i.e. crop varieties that emerged in 21st century i.e. development of transgenic varieties showed promise but foreseen as danger got set back of not being acceptable by many countries. This became source of suspicion of import of food grain from the countries producing excessive food and capable of exporting to other countries. For example, the recent news is of mutant wheat growing in the fallow field in USA (Times Mumbai, 2013). Some East Asian countries have cancelled import order and 27 European countries to raise testing level for US imports. The reason was that wheat patch was genetically modified variety was developed and tested by biotechnology giant Monsanto between 1999 and 2001. Monsanto later withdrew its application to market the modified wheat. Knowing the mutant wheat growing in Oregon, Japan and South Korea cancelled part of their import orders from US. China and Philippines were known to be watching the situation and awaiting the investigation, was reported by the media.

The world wheat trade is 143 million tonnes of which Asian import make about 40 million tonnes, the bulk coming from the US. Other countries that import wheat from US are Mexico, Egypt and Nigeria. In USA wheat export constitutes 50% of total outputs. This year world wheat output is set to be 701 million tonnes. In Europe the GM foods are prohibited and in other countries their scepticism. In USA most of maize, soya, canola and alfalfa crops are GM, but most of produce goes to animal feed. Monsanto's attempt to introduce GM wheat was abandoned in 2005 after it found consumers wary.

The cultural practices have been going on as per justification of the effect of local variations. Nothing emerged as universal culture as a cultural practice to make it of universal application. This situation lead to worsening of land, water, environment and lack of resources for the posterity. This situation has bogged down all concerned with food, environment and resources globally. The racy nature agriculture has carved many challenges and devised solution to the problems. It would be appropriate to say that a universal innovative practice devised in this present development fulfils all challenges in culture i.e. heavy weight arm to strengthen global agriculture.

The varietal improvement had reached to a level of existence of risk in the world agriculture on one hand and the unscientific culture have lead to the situation of degradation of land, water and environment, both leading to the great worry on the global food supply and its sustainability. The racy nature agriculture will go in long way to alleviate the global food situation by enhancing food quantity, quality by way of enhancement in productivity of existing crops and enabling crop diversifications. Many countries which had not been able to produce wheat will be able to produce it in their own country as per enabling situation of racy nature agriculture and get rid of imports. This will be greatest achievement in world food situation. The food quality will be better than it exist under prevailing practice of agriculture. The racy nature agriculture will go long way in bringing sustainable global food production and quality improvement. It is well known fact that the World Food Prize is meant to encourage efforts to enhance productivity of small farmers with the overall growth of achieving a better global food security. This technology of at site resources conservation enables all categories of farmers with poor knowledge and financial resources to join the mission of producing enough and good quality food for the globe as an alternative and supplementing technology to any other technology that would emerge in

time to come. This will alleviate the danger and the global worry of food demand projected to rise by the year 2050. This fact is revealed by the development described vide Fig. 1. The technology is free from any reservation from the users and the consumers' preference. It's at site application enables generation of employment and eliminates foreign reserves need for importing food from foreign countries. Thus, it is a technology that enables create real global food security by feasible and plausible means. Infrastructures are to be developed locally that will usher industrialisation in countries so agriculture and industries will go, may be in the form of corporations as well and flourish together in the synergic way.

Fig. 7: Invention of wheel, a corollary for Racy Nature Agriculture

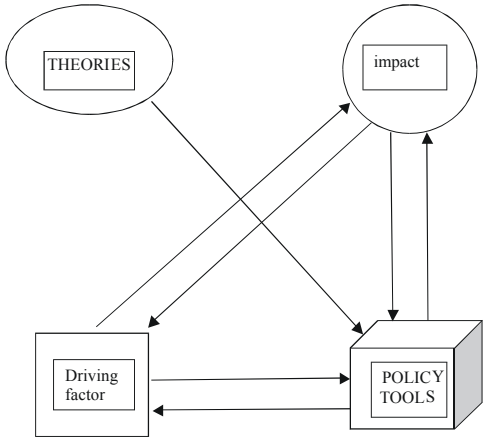

Fig. 8: Link network of Theory, Impact, Driving factors and Policy tools

Application Prospects

Invent Wheel- Pre and Post Development Revolution: The developmental periods can be broadly divided as pre wheel and post wheel era of inventions. Lot of time passed in devising the wheel. Similarly lot of research and developments have proceeded in devising the Racy nature agriculture. The post wheel development period is used in revolutionising the use of wheel to cover innumerable mile stones. Various levels of revolutions have been brought in. In the same way Racy nature agriculture will bring revolutions at implementation of technology in part and will go long way in bringing multiple level developments as refinements appear. The concept will be equally applicable for the controlled environment agriculture re such as green house and Poly house etc. Further, optimisation would emerge for crops, varieties and yearly cropping sequences involved in. It will reduce cost of infrastructure requirement and produce better results than that at present.

Encompassing Driving Factors, Impacts and Policy Tool: It is evident from the figure 8 that theory is very strong decider of the policy tool. So far pre wheel agriculture has been trying to empirically devise driving factors impact in making the policy tool. The later approach is disadvantaged by the individualistic skill, motivation and the environment of safety and security, which would not be same under all the condition. The Racy nature agriculture is devised on the basis of innovative application of scientific facts, hence it will hold well under the entire situation to be universally applicable. It is powerful and enables formation of policy tool. Customisation on the driving factors, impact will enable modify policy tool for local administrative and management reforms. The racy nature agriculture is dominant role player in global food production. The customization and appearance of weak links would be easily fortified to lift the productivity. This weak link management approach will be scientific and professional intervention in building global food security.

How True Are Legendary Saying with Respect to Racy Nature Agriculture: As in other sphere of life there is no shortage of folk tales in agriculture. Some of them have been force fitted in the Indian context. Here is the soundness and corroboration of these saying with science to get guided with correct or incorrect concept that will popularise the right approach in agriculture.

Sell in May and Go Away: This favourite saying dates back to the period when London stock brokers went on long holiday during the summer. Sell in May theory was sell off ones stock holdings before one goes for holiday and start with clean slate on ones return in October. It is quite insignificant in Indian context. In the domain of nature agriculture activities in May are preparatory and revamping the resources. The activity will bring several advantages that will facilitate technology activity efficacy and ease of operation.

Mark Twain Effect: October has been historically notorious months for stock investments. Global stock markets have generated lower than general returns and some of stocks crashed in this months. The 'October down turn effect has been marked as Mark twain affect after the novelist's famous quote. October is one of peculiar dangerous months to speculate in stocks. The others are July, January, September, April and November, May March, June and December. August and February.

In fact these months are correlated with the prospects of production in, by way of likely success of crops by sowing and harvesting dates. The racy nature agriculture will bring down the risks as the productivity will be maintained. Thus, there will be stability in the market so will be stock markets. The Racy nature agriculture will reform business there in and reduce the monthly variability. The stability in the productivity will reduce craze of speculation and it will bring stable global economy.

January Effect: US financial year is January to December. Everybody wants to sell the stocks for accounting and start a fresh in January. The sellers in December become buyers in January. Under Indian situation this effect can be from April to March. As stocks are cleared in March and start afresh in April. There is further contrast in Government spending and private spending. The government financial years are from April to March. Therefore the selling stocks at higher prices in March and buying stocks by traders in April is beneficial. The sellers in March become buyers in April. The government buying in minimum in April nod May hence traders derive strategic advantages of low costs in stock markets. The racy nature agriculture will again stabilise the market trend for year round.

Pre Budget Rally: Stock market tends to surge during the run up to the union budget and slide after it is announced. This happen because budgets in India make lot of policy announcement, which explains why stock markets get excited about their exercise. Markets tend to move higher during the week preceding the budget announcement. Once he budget is out of the way the reality downs and stock prices go back. To their pre budget levels.

Friday Effects: This indicates that the return of Monday will be more volatile than rest of other days. Average daily return generated on Friday was only0.3percent compared to the average 0.67% return generated on other four days.

Elephants Can't Gallop: Giant concerns can not respond so quickly to market rate changes.

Buy When There Is Blood on the Street: It is often said that one should buy when they sigh and sell when they yell. In other words one should do opposite of what everyone else is doing. Baron Rothschild, an 18 the century British banker famously said that buy when there is blood on the street even if the blood is ones' own.

In the racy nature technology the agriculture always brings good effect in the environment and it is not likely to bring bad effect due to exchange in crash agriculture. The example of the cropping practice of paddy wheat cropping practice led to drastic reduction in the ground water table. As established earlier the racy nature agriculture will conserve resources, protect environment and be more productive.

You Need Stomach and Not Brain to Make Money: For making money from agriculture one should be able to withstand ups and downs of climate, nutrient, planting density, intercultural and weeding to convene aerobic condition under all conditions. This is possible in racy nature agriculture technology. The technology provides strong belly to absorb ups and downs to bear the shocks and produce more that will help make money these stock hold more promise than providing other remedial measures under adverse situation.

The Cockroach Theory: The cockroach theory says that one bit of bad news is usually followed by more. Appearance of one cockroach; it is evident that the bug is not alone. There must be more than one hiding somewhere else. The cockroach theory can be extended to any industry as well.

Since the scientific level in Racy nature agriculture is adequate, the cockroach theory will not be applicable. The development is based on scientific footing and with strong foundation. It has no cracks to house cockroaches. Investors should feel assured of return and have confidence of gain.

Brand Equity of the Technology: Users have their own opinion. It is the user's opinion that matters about a brand. The racy nature agriculture technology fulfils many challenges of natural resources management (NRM) which become objectives of various management issues viz. production, quality, saving in water conservation of resources via land, water and environment. Carrying out

one work for all situations is a unique brand and it cannot be surpassed by any other ones. It is the best brand in agriculture improvising. It surpasses the organic food to say. The users feedback will help make improvement generation III (3G) agriculture. This entire development is based on sound research of existing results and thorough analyses of others finding that support scientific facts. This is not mere one practice but convergence of practices and their sequencing in order of the need of crop growth. The development has enabled confident expertise and ideal package. This technology proves better than others. For example this technology surpasses the most preferred organic food, where the pollution of water, soil and the organic manures etc might infest the produce. The organics may not fulfil the required quality as the produce of the nature agriculture will contain. Research publications on issue of this technology are improving its brand. Keeping check on digital reputation is an important aspect being gauged. So far no adverse comments have been recorded about this innovative technology of racy nature agriculture. The heavy expenditure of energy in the bed preparation gets overshadowed by the other gains.

DISCUSSION

The racy nature agriculture has displayed its application and capability to enhance yield of diverse crops under variable condition. It has also capability to reduce the GHGs. There are a very few practices which are conscious to reducing GHGs. Yield increases in the RBC were observed as border effect, crop diversification and to some extent saving in irrigation water. However, in the racy nature agriculture many aspects were added with the scientific justification to conserve environment and bring enhanced food security and quality. The practice of RBC, being one of the aspects, very common in agricultural technologies, used in RBC, *Chinampas* and racy nature agriculture which has been experimented but could not be scientifically justified. This no clear cut scientific understanding did lead to several discontinuations. It could not continue as a practice. In addition to the RBC the racy nature agriculture contains several aspects of production practices which were not included in the RBC experiments. There have been no thinking on the irrigation by sprinkler and supplemented by application of over irrigation of the furrows. This makes the racy nature agriculture practice a completely new innovative technology of universal applications.

In the array of contrasting technologies (Table 10) *Chinampas* of Mexico could not be sustainable by its beneficial impacts and people are resorting to higher economic returns paying practices of poly house culture green house culture. Thus, in order to maintain the social benefits compensations are being paid to the people to continue practice of *Chinampas*. It needs to be mentioned that the *Chinampas* is a land formation and poly house / green house are environment creators. Any technology of ground supported with encironment factor should be taken as good opportunity to build its image by impact. However it could not be done in Mexico that supports the claims that *Chinampas* development was not on any scientific basis. This fact has been built in the racy nature agriculture ant this practice is applicable for natural as well as built environmental conditions. This is a real scientific innovative technology of universal application.

The legume based participation in agriculture is focussed in Malawi. Although supplementation of nutrient is advantageous for enhancing productivity of maize main subsistence grain its essential are not scientifically appraised off. The nutrient management in maize requires all types of intervention in the practice in the racy nature agriculture. The study of gender involved and contradictions are in no way beneficial for inducing food sustainability. Lot more innovations are to be included for improving prevalent technology in Malawi. The racy nature agriculture will bring all needed improvement at one shot. It needs its application for quick relief of food shortages and diversifications in many such countries.

Other technologies such as AWD and watershed management projects are conceptually right but when it comes to the practices they are just at random and do not fulfil requirement of green agriculture. The AWD is short of scientific concept in contrast with racy nature agriculture. What AWD does it for the part time only, the racy nature agriculture does for all the time. The racy nature agriculture convenes secondary natural resources management and enhancing resources use efficiency. Thus there is no comparison of AWD with the racy nature agriculture technology.

The little Donkey project of China is a community supported agriculture, where risk is shared by the members and thereby get produce after harvest. Because of increasing demand of organic food people have liking to join the cultivation venture to get fresh supply of organic food. It involves replacement of chemicals for weeding and insect pest management. The practice might be producing organic food but it is in no way scientific in reducing the GHGs. Thus it cannot be said a green

technology. Little donkey project lays more emphasis on coordination of production, marketing and sale. The racy nature agriculture fulfils all need of community support but functionally it is different from the Little Donkey project. Racy nature agriculture can be operated by any individual, group or the entire watershed. It is technology scale independent that means it can be applied to any scale of land size.

SRI employs novel aspect of plant physiology and precision planting. Their emphases on water, land and nutrient condition have to be established. As a fascination researchers have been experimenting SRI with drip irrigation. That means there is no concept of scientific principle that totally discards the drip irrigation favours the sprinkler irrigation. Likewise, there have been very few researches on the use sprinkler irrigation for cultivation of wheat. The good crop stand promising yield shown in figure 7 from CIAE Bhopal is without use of RBC, but it does supplement the applicability of sprinkler irrigation for wheat crop. Further, fortification of water application by over irrigating furrows could bring still better results than with only sprinkler irrigation applied at CIAE Bhopal. The study at CIAE Bhopal was based on the fascination of application of automatic control irrigation on when to irrigate and how much to apply. This has been the old concept. Nevertheless, there is scope for combining the research approaches for devising water management technology for enhancing productivity and reducing the GHGs. [10, 34, 35] devised innovative water technology for global sustainable productivity.

The liking for quality food is increasing with time as revealed by the results of a recent survey conducted on Beijing CSA members. The survey support the premises that increasingly well-off consumers, while still price sensitive, will demand higher-quality food products as incomes increase (Veeck and 2004) [15] In a climate of uncertainty around food safety, evidence also suggests that consumers are willing to pay a small premium for products meeting basic environmental standards. These general premises and scenario of changing economic conditions, changing consumption values and an increasing identification of environmental well-being with human health demand high quality food. As indicated earlier, the organic food may not be completely free from heavy metals of growing and surrounding environment. The racy nature agriculture has capability of producing non polluted and heavy metal and toxic gas free food for not privileged society alone, but for all global gentry. This is a wonderful development of nature food.

But the certified organic produce available in higher-end supermarkets may sell for two or three times as much as Little Donkey's; and for consumers who are willing and able to spend more to procure health and environmental benefits, CSA membership can be a sensible choice. Furthermore, CSA farms and other alternatives to the conventional food system can be seen to present an implicit critique of government – or at least the government's capacity to ensure consumer access to safe food. Little Donkey's project can be considered fairly sensitive in light of the social-stability stakes to a safe national food supply and this reality demands a degree of political awareness among the farm's operators as they promote and publicize the farm. Adoption of racy nature agriculture in the Little donkey project will expand horizon of adoption and beneficiaries at lower cost the nature food better than organic food without any conflict but in mutual supplementing way.

In the Indian watershed management many achievements are claimed favouring still vigorous program in India. Adoption of racy nature agriculture, which is best improvisation will easily raise the quantity and quality of productivity in watersheds. The soil conservation and water mangement practice will require new overhaul in research approach. Savings in scientific time, resources and money and environment conservation will get enhanced by application of the racy nature agriculture.

Racy nature agriculture is the technology which is capable to take care and conserve resources for posterity, which no other known technologies can do it. This fact of insured posterity brings global relief.

The two case studies demonstrate the potential for large reductions in rice production GHG emissions with relatively low opportunity costs and, in some cases, increases in productivity. Adapting the technologies to local conditions is necessary and involving local farmers, extension agents and research institutions in technology design and dissemination is critical. Measuring the reductions in GHG emissions can be done by using process methods supplemented with some field testing. Methane reduction from irrigated rice should be made eligible for offsets and other mitigation funding opportunities as an outcome of the Copenhagen negotiations. Rice production also demonstrates the potential pitfalls of allocating Certified Emission Reductions (CERs) in the land-use sector. Water-saving techniques can reduce GHG emissions in a given area of rice land, but, in most cases, the saved water will then be

used to irrigate more rice land or new crops in future seasons. Subsequently, savings are offset by emissions created in newly irrigated and. ironically, if the saved water was channelled to other users, for example, in residential areas, one could rightfully claim CERs because of a net reduction in GWP caused by the mitigation project. Increasing food production is an absolute necessity for the human population and improved resource-use efficiencies are imperative to achieving this goal. As an agricultural research institution devoted to the increase in food production, IRRI proposes specific provisions for CER allocations in the land-use sector to converge the legitimate goals of food security and GHG mitigation in a Copenhagen agreement [36-38]. As long as saved resources, namely water and fertilizers are used to increase food production in a resource-efficient manner, it seems undue to account for new emissions as offsets or leakages of a mitigation project. The racy nature agriculture is able to justify worry and find alternative use to eliminate the problems. The water saved can be used to raise other crops which in terms get cultivated by way of crop diversification. Since it involves year round cultivation technology winter season crops should be other than paddy crops. Hence, it is in justice on the part of environment conservation the boro rice which adds to additional hectarage of rice cultivation. The *Boro* practice should be stopped and other uo land low irrigation water requiring crops should be cultivated. This practice will increase the yield productivity of paddy growing regions and benefit the environment. This new concept needs adoption as policy issue in the ICCC panel (IPCC) [21].

CONCLUSION

Racy nature agriculture developed by innovative application of scientific facts of decomposition, nutrient uptakes, photosynthesis, soil chemistry and environmental engineering is proved the best agriculture technology in this contrasting study. It enhances food productivity universally at the same time protects environment from building GHGs on account of agriculture. It surpasses organic food and enables better and large scale availability within the reach of the large global consumers. It needs launching application initiatives to harness benefits right from the day one in manner proportionate to application. Application of the racy nature agriculture will relieve from worry of food and environmental security globally. This nature technology is capable of bringing sustainable, food and environment on the global perspective. It is capable of alleviating misdeeds of earlier practices and conserves resources for posterity. This research based technology named as racy nature agriculture will be panacea technology for global agriculture. Future research needs are on optimisation of inputs, tools and plants and peoples' participation.

Al support was used in preparing the article.

ACKNOWLEDGEMENT

Author duly acknowledges the use of references published in literature. Certified that no institutional financial support was used in preparing the article.

REFERENCES

1. Parviz Koohafkan, A. Miguel Altieri and Eric Holt Gimenez, 2012. Green Agriculture: foundations for biodiverse, resilient and productive agricultural systems. International Journal of Agricultural Sustainability 10(1): DOI:10.1080/ 14735903.2011. 610206: 61-75.
2. Xie, J., L. Liu, X. Chen, J. Chen, X. Yang and J. Tang, 2009. Control of diseases, pests and weeds in traditional rice-fish ecosystem in Zhejiang, China. Bulletin of Science and Technology, 25(6): 801-805.
3. Narsimhamurthy, K., 2012. Innovative farming gives un expected high yield. Kolar, Feb 17, 2012.DHNS Daccan Herald News Service.
4. Jat, M.L., S.K. Sharma and K.K. Singh, 2006. Conservation agriculture for sustainable farming in India. Paperpresented at the Winter School training at Department of Agronomy, TNAU, Coimbatore, Jan 17, 2006.
5. Chsak, Sutthib, C. Jesda Keawkulyayo and Roongnapa Korprditskuld, 2011. Water management in raised bed system: A case study from the Cha Phraya delta. Thailand Francois Mellea Thailand. Agricultural Water Management.
6. Donald Vancooten and K. Andrew Ronald, 2012. Growing rice on raised bed. Ileia. http://www.agricultural crops.org/magazenes.
7. Kenneth D. Sayer, 2006. Raised bed cultivation. Encyclopedia of Soil Science.
8. Lauren, J.G. *et al*., 2006. Permanent Raised Bed Cultivation Improves Nitrogen and Water in Rice Wheat Cropping System of South Asia. 18th World Congress of Soil Science. July 9-15. 2006, Phildelphia, Pennsylvania, USA. Kenneth D. Sayer, 2006. Raised bed cultivation. Encyclopedia of Soil Science.

9. FAO RAP, 2006 Arsenic contamination of irrigation water, soil and Crops in Bangladesh: Risk implications for Sustainable agriculture and food safety in Asia. RAP Publication 2006/20 Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific, Bangkok, 2006.
10. Yadav, R.C., 2012. Innovative Application of Scientific Facts for Recovery of Nutrients from Waste Water Streams for Sustainable Agriculture and Environment Protection." Hydrology- Current Research., USA. Published on Line, 4: 1-9.
11. Yair Merlín-Uribe, Carlos E. González-Esquivel, Armando Contreras-Hernández, Luis Zambrano, Patricia Moreno-Casasola and Marta Astier, 2012. Environmental and socio-economic sustainability of *Chinampas* (raised beds) in Xochimilco, Mexico City DOI:10.1080/14735903.2012.726128, pp: 216-233.
12. Willer, H. and M. Yussefi, 2006. The World of Organic Agriculture: Statistics and Emerging Trends 2006, Bonn, Germany: IFOAM.
13. Paull, J., 2007. China's organic revolution. Journal of Organic Systems, 2(1): 1-11.
14. Kledal, P.R., Q. Hui, H. Egelyng Y. Xi, N. Halberg and X. Li, 2007. Organic food and farming in China. In The World of Organic Agriculture – Statistics and Emerging Trends 2007, Edited by: Willer, H. and Yussefi, M. Bonn, Germany and FiBl, Frick, Switzerland In The World of Organic Agriculture – Statistics and Emerging Trends 2007, Edited by: Willer, H. and Yussefi, M. Bonn, Germany and FiBl, Frick, , Switzerland:
15. Veeck, A. and A.C. Burns, 2005. Changing tastes: the adoption of new food choices in post-reform China. Journal of Business Research, 58(5): 644-652.
16. Singh, S.N., A. Verma and L. Tyagi, 2003. Investigating Options for Attenuating Methane Emission from Indian Rice Fields. Environ Int., 29(5): 547-53.
17. Tasneem, K., Sagar Babu, S.A. Abbasi and Abbasi, 2011. Contribution of Paddy Fields to Methane Emissions and the Strategies to Control it: the Indian Scenario." IJESER, 2(2): 01-07.
18. Wassmann, Reiner, Yasukazu Hosen and Kay Sumfleth, 2009. Reducing Methane Emissions from Irrigated Rice-Case study: Mitigation within one irrigation system in the Philippines Agriculture and Climate Change An Agenda for Negotiation in Copenhagen For Food, Agriculture and the Environment, Focus 16 ● Brief 3.
19. Xu, X., Y. Wang, X. Zheng, M. Wang, Z. Wang, L. Zhou and O. Van Cleemput, 2000. Methane emission from a simulated rice field ecosystem as influenced by hydroquinone and dicyandiamide. Sci Total Environ. Dec., 18: 243-53.
20. Saenjan Patcharee, Paiboon Natthakittiya and Tragoolram Jamnong. 2012. Sulfate Fertilizer Influencing Methane Emissions in Paddy Field and Rice (cv. Chainat 1) Production. Khokaen Agr. J., 40: 359-362.
21. IPCC, Intergovernmental Panel on Climate Change, 1994. Climate change. In: J.T. Houghton, L.G. Meira Filho, J. Bruce, Hoesung Lee, B.A. Callander, E. Haites, N. Harris and K. Maskell, (eds) Radiative Forcing of Climate Change and an Evaluation of the IPCC1992 Emission Scenarios: Cambridge University Press, Cambridge.
22. http://assamagricultural business.nic.in.
23. Firestone, M.K. and E.A. Davidson, 1989. Microbiological basis of NO and N_2O production and consumption in soil. In: Andreae MO & Schimel DS (eds) Exchange of Trace Gases between Terrestrial Ecosystems and the Atmosphere, pp: 7-21. John Wiley and Sons, Chichester.
24. McFadden, S., 2004. The history of community supported agriculture, part I: community farms in the 21st century: poised for another wave of growth? Rodale Institute. [available at http:// newfarm.rodaleinstitute.org/features/0104/csa-history/part1.shtml.
25. Zhang, L., Y. Zhengand and Z. Wan, 2005. A summary of research on urban agriculture in China. Guangdong Agricultural Science, 3: 85-87.
26. Gill, J.S., G.S. Clark, P.W. Sale and R.R. Peries, 2012. Deep placement of organic amendment in dense sodic subsoil increases summer fallow efficiency and the use of deep soil water by crops. Plant Soil., 359: 57-69.
27. Mumbai, H.T., 2013. Indians harvest claims 120% fake Claims Chinese scientist Hindustan Times Mumbai, Feb, 22: 201.
28. Economic Times, 2013. Govt mulls crop switch in Punjab to save soil, water. The Economics Times, New Delhi, March, 4: 17.
29. Biswas, H., Dev Narayan and Lal Lakaria Brij, 2012. Effect of integrated nutrient management on soil properties and performance of aonla (Emblica officinalia Gaertn) based agri horti system in Bundle Khand region . Indian J of Soil Conservation, 40(2): 141-146.

30. Yadav, R.C., 2013. Racy green technology of resources management for enhancing global food production for the present and posterity. International Journal of Management Science England, UK (Under review).
31. Economic Times, 2013. Nagpur Real State vision 2020. The Economic Times. New Delhi, Tuesday April, 9: 15.
32. Jin, H.P., G.K. Choppala, N.S. Boloan, J.W. Chung and T. Chuasavathi, 2011. Biochar reduces the bio availablilty and phytotoxicity of heavy metals Plant Soil, 348: 439-451.
33. HT New Dehi, 2013. Mutant wheat growing in fallow US field. Times of India Mumbai, June, 3: 11.
34. Yadav, R.C. and Jaya Yadav, 2013. Development of Business Process Outsourcing (BPO) for sustainable productivity and natural resources management in primary sector of national economies International Journal of Management Science and Engineering Management, England, UK Published on line.
35. Yadav, R.C., 2013. Innovative application of scientific facts for development of water technology for sustainable productivity and environment conservation for green living. Omics Water Tech Expo & International Conference, Exhibition Centre, Mumbai. Feb, 12-14.
36. Abou-Deif, M.H., M.A. Rashed, M.A.A. Sallam, E.A.H. Mostafa and W.A. Ramadan, 2013, Characterization of Twenty Wheat Varieties by ISSR Markers, Middle-East Journal of Scientific Research, 15(2): 168-175.
37 Kabiru Jinjiri Ringim, 2013. Understanding of Account Holder in Conventional Bank Toward Islamic Banking Products, Middle-East Journal of Scientific Research, 15(2): 176-183.
38. Muhammad Azam, Sallahuddin Hassan and Khairuzzaman, 2013. Corruption, Workers Remittances, Fdi and Economic Growth in Five South and South East Asian Countries: A Panel Data Approach Middle-East Journal of Scientific Research, 15(2): 184-190.