April 2013

Development Matters

Monthly Development update from DHAN Collective

Feature

Small Millet / Walkathon 2012

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Monthly Development update from DHAN Collective
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DHAN has organized Walkathon on February 2, 2013 on the theme Agricultural Biodiversity and Food Security with focus on small millets, with the aim of taking the message to thousands of public on the links between agricultural biodiversity and food security and also how small millets can play a crucial role to address the issue of improving agricultural biodiversity as well as ensuring food security.

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From the Editors' Desk

Dear Readers,

Greetings from DHAN Foundation.

This February 2013 issue of Development matters features an article on the mega event of DHAN foundation 'Walkathon" on the theme of Agricultural biodiversity and food and nutritional security, the special focus being on small millets. An interesting article on indigenous agricultural implements used by farmers of Anjetti, Krisnagiri District, Tamilnadu shows how knowledge gained through experience can help reducing the drudgery of farmers. The eighth development film festival this year which had focus on climate change and food security had a overwhelming response from public, media persons and students which was presented in an article. A launch note on Climate change adaptation theme also features in this issue. Roof water harvesting is a feature article which will help one to design and install a rain water harvesting system at household level. A case study of Uravaugal Kalanjiam which facilitated livelihood enhancement of its members is presented in this issue. A feature article on how we should lead our life as a climate sensitive citizen is also presented in brief in this issue.

The readers are welcome to give their suggestions and feedbacks on the articles featured in the development matters. They can send their mails to *dhancdc@dhan.org*

Happy reading!

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Strategic Shift in Agriculture

M.P.Vasimalai*

New pathway is emerging in Indian Agriculture with Strategic shift towards specialized segmentation-Urban Agriculture, Coastal agriculture, Tankfed and Rainfed agriculture. Canal based agriculture and Groundwater based agriculture; Structural change-Value addition(processing and packaging), safe storage and marketing, agricultural extension, mechanization of agriculture and seed market; climate change adaptation-Farm ponds, risk management with crop insurance, changing cropping systems and food security with nutrition and health expanding small millets, pulses and oilseed production, organic farming and sustainable agriculture.

Growth and Development

Paradigm shift towards agriculture development than agriculture growth is the need of the hour. Structural change in agricultural strategies would be a primary constituent of agricultural development. Traditional agricultural growth prospective has limitations in addressing changing scenario of agriculture. Present agricultural labour market dictates a strategic shift in viability of agricultural production system. Sustainable agriculture is a part of development perspective with climate change adaptation.

Sub sector specialization: Segmentation

Agriculture sector demands specialized approaches, methods and technology for development of different geographical and climatic zones. Coastal agriculture involves mixed agricultural system, cropping system and livestock. High rainfall, fragile water resources, cyclones and floods, sandy alluvial soil, back waters, delta are some of the salient feature of coastal agriculture. Sea water intrusion with alarming climate change threatens the coastal agriculture system. Backwaters are expanding and making agricultural lands unusable. Disasters like cyclone and floods hit coastal areas frequently in turn vulnerable with high risks in agriculture. Hence a special thrust should be on coastal areas with action research, different agricultural package, water resource management, coconut and cashew plantation and distinct agricultural extension system. Specialized Krishi Vigyan Kendras (KVK) has to be established for coastal agriculture. Urban Agriculture is emerging as a sub sector with growing urbanization. Peri-urban areas are raising vegetables to meet the demands of urban population. It is kind of high value agriculture with marketing arrangement of gardens are also becoming a common feature to meet urban Kitchen. Using grey water for peri-urban agriculture is another potential area for development. Linking slum vendors for marketing of urban agriculture primarily vegetables would be a livelihood enterprise for them. Hence a specialized unit has to work on urban agriculture with more scalable projects to address distinct need of this segmentation.

Indian agriculture has an unique feature of small scale water bodies to mitigate droughts and flood moderator with tankfed agriculture system. Those water bodies are living heritages for centuries and lifeline for rural livelihoods. Farmers are managing these water bodies with their creative adaptation over many centuries. Tankfed agriculture requires special thrust with rigorous research, distinct extension methods, improved agronomic practices and crop production system

Irrigated agriculture is now going through a transformation towards sustainable agriculture with organic farming, integrated pest management (IPM), Integrated nutrient management (INM) precision farming with drip and sprinkler irrigation and water conservation. Ground water based farming is very fragile and it has to be integrated with recharge structure and closer monitoring of water balance of this segment. Over exploitation of ground water leads to a disaster situation. New generation perspective has to be developed for each segment and deserves mission mode approach. Restructuring of agricultural system based on segmentation is critical for future development of Indian agriculture. Diversity of agriculture situation has to be recognized and strategic shift is imminent.

Structural Change

Agriculture is undergoing a dramatic change. Growing price, rise of inputs and seasonal swing of output price challenge the viability of crop production. Now farmers have to integrate value addition activity with their crop production to improve viability of their farming. Range of value addition, simple grading and packaging, semi-processing, standardized processed food are possible in a decentralized manner. Structurally moving from

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farming to enterprise mode, both at household or farm and collective with different form including producer company with village based producer group, would be the future way. Safe storage at village is going to give and answer to price fall during harvest season. Farmers collective with bankers support could organize safe storage at village and towns. Cold chain could be created for fruits and vegetables to fetch a good price with quality. Corporate Social Responsibility (CSR) of corporates could extend safe storage facility to farmers. Infact care today has provided four such safe storage facilities in Nagapattinum district for coastal farmers.

Marketing of agriculture produce would yield a greater gain to farmers with fair trade practices. Consumer price spread offers a band width for farmers to enter into market through organized channels and directly. Communication and information technology provides space for on time price information for better negotiation with market. Consumers are also interested to have a direct contact with producers to get a good quality product and affordable price. Regulated markets has to go through a structural change with changing market situation.

Mechanization of farm operation is emerging as a new way to handle labour shortage and high wages. Because of fragmented land holdings, peasant collective for mechanization would be the right way for scale and viability of mechanization. Pilots are going in many parts of India and time has come to scale-up mechanization in all segmentation of agriculture. Seed market has a greater role in crop production. Structurally farmers are moving away from seed production and multinationals are gaining control over seed market. There has to be a balance and regulations to ensure access and control of seed market by producers Farmers Collective would access seed farms for better access and control.

Climate Change Adaptation

Agricultural adaptation to climate change has to be facilitated. Climate change brings a new challenge to farming in terms of uncertainty of rainfall, frequent disasters (droughts and floods) and temperature variation. Change in cropping pattern has to be evolved to respond to climate change. Multiple crops in a same rainfed field during the season would address climate variation and stabilize the income to farmers. As many as eight to ten crops are sown in rainfed areas during a season as an adaptation mechanism. Pulses, oil seeds, millets and fibers are part of the mixed cropping. Micro climate has to be digitized as that of micro water sheds for evolving adaptation methods. Establishment of an automatic rain gauge or a micro climate zone would enable farmers to go for weather indexed crop insurance. Now every development block plans to have and automatic rain gauge but that is not adequate. At least every five to ten square kilometer need an automatic weather station to guide the farmers to scientifically manage their risks and vulnerabilities. Farm ponds are becoming drought mitigators in rainfed areas, also climate change adaptation tool. Farmers are willing to go for more than a hundred farm ponds in a small hamlet to regenerate their rainfed farming.

Food Security with Nutrition

Balanced farming means a district or state cultivate not only abundant cereals but also pulses, oil seeds, more so fruits and vegetables. Sophisticated technologies are available but they are not for farmer friendly. Self-regulation of farmers with farmers collective as SRO (Self Regulating Organization) to make balanced farming a reality. Market forces distort the balance in farming nd requires regulatory support from the state. India is at the bottom in terms of Nutritional security. . People are living with massive nutrition deficiencies. Our food security has to be fine-tuned with nutrition security immediately. This strategic shift would bring healthy citizen with higher productivity. Small millets production and consumption has drastically come down because of cereal consumption through public distribution system.

Small millets otherwise called ‘Nutraceuticals’ are rich in minerals with slow release of carbohydrates. Expanding small millets production and consumption would ensure nutrition security with sound health. Pulses and oil seeds production have priority over cereal production in irrigated areas and continued mission mode approach would ensure a desirable future. Organic farming gains considerable acceptance and fetches high price with niche market. More farmers are moving towards organic farming and it would demand support mechanism for production and marketing, while sustainable agriculture is appreciated, large scale practice with holistic understanding needs attention. Sustainable agriculture is a complex process with long term perspective and involves solid health, ecological sensitivities, organic practices, rainwater harvesting and conservation and preservation of biodiversity. Different stakeholders are conscious of the change in agricultural production system. Proactive policy and practice change are required immediately to bring desired change. □

Mainstreaming Youth in Panchayat Raj Institutions

S.Singarayar*

The United Nation defines adolescents as those aged 10-19 and youth as those aged 15 – 24. Young people is a term used to include both and refers to those aged 10 – 24. Many countries including India deviate from this definition, with age ranges between 10 – 35 years. All youth should be able to meet their basic physical and social needs, develop individual assets and competencies and engage with their communities. The youth have to come across various transition phase viz., learning, world of work, staying healthy, starting family and exercising citizenship.

Exercising citizenship is the crucial phase for any youth and during this phase, the youth have to get experience in the following areas.

- Exposure to political awareness
- Political representation
- Sustainable development
- Right and duty to vote
- Women and minorities in leadership roles.

To develop the skill of exercising citizenship, Rajiv Gandhi National Institute of Youth Development, PRIYA Division initiated an action research project in all the states in India called "Mainstreaming youth in Panchayat Raj Institution" DHAN Foundation Panchayat Development Programme collaborated with RGNIYD to implement the project at Puducherry Union Territory.

1. The project

The project "Mainstreaming Youth in PRI" was initiated in Pudhucherry Union Territory on Feb 2012 and identified the Pillaiyarkuppam Panchayat of Villianoor commune for this project. The project period was one year. The focus of this project was as follows.

- Analysing the needs, concerns, Issues, Problems and priorities of youth
- Active participation of youth in the Governance
- Systems and Institutions development for youth development in the area
- Youth budgeting.

The main stakeholders for this project are the Pillayarkuppam Gramapanchayat, youth at Pillaiyarkuppam Panchayat and DHAN Panchayat team as facilitator.

While we start this project, the five year term of the local body in Pudhucherry was over and there was no election conducted for the next term. So, the village Panchayat was not functioning and hence could not

Information about Pillaiyarkuppam Panchayat	
State	Puducherry
District	Puducherry
Commune	Villiyanur
Name of the Panchayat	Pillayar Kuppam
Hamlets	Pillayar kuppam and Ramanathapuram
Area	10.S.q.K.M
Male	2184
Female	2116
Children (Below13 years)	287
Youths (13-35 years)	1450
Religion	Hindu:99% others 1%
Caste	BC:70% Sc:30%

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participate in the project. So, DHAN could continue this project by way of implementing various activities so as to enable the youth community on awareness creation, capacity building, take up volunteer works and active participation of building local governance.

1. Issues / Concerns observed

The analysis of the field situation and interaction with the youth in the Pillayaarkuppam Panchayat, revealed the following issues in the village

- Absence of unity among the youth community.
- Poor participation in local body activities.
- Lack of quality guidance
- Infested with bad habits like smoking and drinking
- Absence of institutional mechanisms among the youth.

2. Focused activities in the project

To address the issues and concerns observed among the youth in pillaiyarkuppam panchayat we initiated a series of activities with the involvement of the youth.

Organizing the youth as forum

Steps were taken for organizing the youth community in Pillaiyarkuppam panchayat. The youth forum was initiated with 18 youth and gradually it was strengthened by increasing the membership up to 40. This youth forum conducted monthly meeting regularly and discussed various issues. This served as a binding mechanism to create unity among youth and there was good co-operation among them for undertaking events.

Promotion of youth resource centre

To strengthen the youth forum, infrastructural facilities like a meeting place was needed to assemble in a place and to conduct regular meetings. One of the youth provided their unused house for this purpose and it was promoted as youth resource centre. Daily news papers and other books, materials were made available there and the youth used to visit the resource centre and passed the time more constructively. Every day around 15 – 20 persons used this centre and got benefited. Above all this centre was identified as a place for them to meet.

Conducting sports and Games

Events like sports and games give right kind of spirit and excitement among the youth community. So, formal sports and games events were organized so as to involve more number of youth during this project period. On 2nd September, a sports event was held and around 80 youth participated in the event. They were supported by a gathering who came as spectators. Four events organized and the winners were given prizes. During the pongal festival, there were two days event and around 160 youth both girls and boys participated in the event.

Motivating on volunteer works

The concept of youth volunteer was seeded among the youth in pillaiyarkuppam. This was well received and the youth rendered their voluntary support for the following

- Tree planting event was organized and 50 timber species were planted for shadow purpose in the important streets and they took responsibility for maintenance also.
- Denku fever awareness camp was organized among the youth and handful of youth- both girls and boys were involved who went door by door to insist people to follow the practice as suggested by the health department to avoid the risk of denku.
- “Ulavarapani” was under taken by the youth in Pillaiyarkuppam Koothandavar temple. One full day was engaged by around 25 youth and done significant cleaning works.

Voter list updation

The state Government took initiative to conduct local body election during middle of the year but it could not be done. During that time the pillaiyarkuppam youth around 40 persons were involving in updation of voter list. It took 2 – 3 days for doing this process perfectly.

Training on Panchayat affairs

Formal training programme on panchayat affairs was organised for the Pillaiyarkuppam youth twice. Around 20 youth were participating in the training programme. It was an opportunity to them to understand more about the role of panchayat, elected representatives and the public. It was an inspiring event for most of the participants to actively participate in the local bodies.

Yoga training

Among the youth in Pillaiyarkuppam, one resource person was identified to train others on yoga. He took responsibility, to give regular yoga training to the youth every Sunday morning by 7 – 8 am. Around 25 youth participated regularly.

Awareness creation through walkathon

Awareness creation on Agriculture and biodiversity and food and nutrition security was done by organizing a walkathon event for villianoor commune on 2nd Febraury, 13. Around 75 youth participated in the event and conducted a small rally and distributing handbills. Around 1500 people were benefited through this event and finally there was a public meeting where the importance of minor millets was insisted to the public.

Computer education for youth

The educated youth in Pillaiyarkuppam were sensitized to learn computer education. Around 30 students came forward to join in the computer training course and finally 24 students enrolled in the DCA course in nearby computer education centre. We made tie up arrangements with the computer centers and negotiated for lesser fee. Presently the 24 students are continuing their computer education.

3. Impact created among the youth in Pillaiyarkuppam

Since the role of the panchayat was absent, DHAN played a key role in organizing the youth and empowering them to work for a common goal. DHANs initiative produced a remarkable change the attitude and life of youths in Pillaiyarkuppam panchayat.

1. **Behavioral change:** The youth in Pillaiyarkuppam are utilizing their leisure time by engaging them in sport activities. Every day evening the youth play volley ball in Pillaiyarkuppam. This reduced the unproductive chatting and wasting of time. The resource centre is being used more meaningfully. A set of youth who are interested in games got naturally organised and this time is spent in right way.
2. **Increased Social concern:** The handful of youth have emerged to take-up any problem arising at their village level and address them by taking suitable measures. They guide the people properly for getting their entitlements. The problems of the community at any level and at any form gets handled by the youth.
3. **Increased role in panchayat affairs:** Around 40 youth have more clarity and basic knowledge on role of panchayat, role of individual etc. We can expect them to actively participate in the panchayat affairs in coming years. Especially the youth community will actively participate in the Gramasabha meetings and few of them are prepared to contest in the coming panchayat election. We can expect the polling percentage in Pillaiyarkuppam to increase in the coming election.

4. Volunteerism concept improved

- The youth in pillaiyarkuppam are actively involving in organising and regulating the public during the festival time.
- The planted seedlings are maintained by the youth.
- The cleaning of the temple – is being maintained by the youth regularly.
- A set of youth has enough attitude on undertaking any common work.

5. Qualitative leadership

The leadership quality among many of the youth in pillaiyarkuppam got expressed considerably through the opportunity provided to organize public events, working for the community, taking up volunteer ship and getting more awareness and outside exposures. Our role was only initiating the things and most of our initiatives are regularly followed up by the youth because of their local leadership.

4. Way forward

Mainstreaming youths in Pillayarkuppam panchaya is a pioneer initiative for the DHAN panchayat programme in Puducherry state. It would be strengthened by way of constant motivation and facilitation of the youth. This served as a learning process for DHAN as well as youth in Pillaiyarkuppam. This can be replicated in other panchayats in Pudhucherry. After the local body elections in Pudhucherry this year, we can motivate the panchayats to take up active role in organizing the youth in their panchayat to use their strength for more meaningful purposes. □

Development News

Simple Cure for Brain Damage

Pharmaceutical scientist Mami Noda, Kyushu University and neurologist Bruce Ransom, University of Washington found a simple cure for brain damage resulting from stokes. In ischemic stroke, a clot blocks blood flow to part of the brain, killing neurons in its wake. But the worst damage often happens after the clot dissolves and surviving brain cells revive. The cells release reactive oxygen species, molecules that damage and kill cells. To prevent this a research by giving a drink of water enriched with hydrogen gas was given to mice for 7 to 10 days was carried out. The animal's optic nerves which connect the eyes and brain were removed and preserved alive in a dish later. To mimic the effects of stoke the nerve fibers were deprived of glucose and oxygen for an hour. It was found that 50 % of the nerve fibers of the treated mice survived contrary to the 25 % survival rate i.e. the survival chance was increased to 50 %. The hydrogen gas seems to act as an antioxidant, protecting brain cells from the toxic aftereffects of oxygen starvation caused by strokes

Source: Discover magazine.

Poverty-Biodiversity indicators

In the eleventh meeting of the Conference of the parties to the convention on biological diversity at Hyderabad, a draft report on "Development of Poverty-Biodiversity Indicators and their Eventual Application" was submitted. The relationship between poverty and biodiversity is inversely proportional and arriving at the indicators is indeed a challenging task and very much specific to context says the paper. Any effort to meet the basic human needs (water, food, wood and bio-energy) goes at the expense of biodiversity. When an ecosystem gets over used or exploited then a lose-lose situation will arise.

Governance, policies on poverty and biodiversity conservation, and population growth and density which are associated with the socio-economic context are critical in determining whether or not biodiversity utilization leads to actual poverty reduction. Furthermore, no single relationship between biodiversity conservation and poverty reduction exists, and there is certainly no linear relationship with many millions of people having benefited from the transformation of ecosystems and exploitation of natural resources. The report recommends to consider the context and the scale, to develop indicators that are closely related by keeping the linkages between biodiversity and community simple, preparing a conceptual framework first and later elaborating on it and also to collaborate to use the existing indicators

Source: UNEP/CBD/COP/11/INF/40

System of Rice Intensification - Solution to future food needs?

Increasing the productivity of the crops using minimum natural resources, in a very effective way is the challenge ahead to ensure the food security of the growing world population. The exploitative agricultural practices has already limited the availability of water and degraded the fertility of the lands to greater extent. Climate change poses a serious threat to the productivity of crops particularly in tropical countries since it alters the frequency, quantity and duration of rains and also keep increasing the global temperature. Current UN projections indicate that world population could increase by more than two billion people from today's levels, reaching 9.15 billion by 2050. Incomes will grow even faster. To meet the increased demand, FAO projects that global agricultural production in 2050 will be 60 percent higher than in 2005/07 (FAO, World agriculture towards 2030/2050, working paper, June 2012).

Rice and food security

Historic and genetic evidence shows that domestication of rice originated in Chine8200-13500 year ago. From there rice spread to South east and South Asia. Rice was introduced to Europe through Western Asia, and to the Americas through European colonization. Today rice in grown in 165 million ha in 114 countries and 2012-13 estimates show's that 460 million tonnes (on milled basis) of rice is produced in the world. In India the production is 103 million tonnes (22.25 %) of the world's production.

Rice produces maximum calories among all cereals. Rice is being the staple food for millions of people, particularly the Asians who produce and consume 90 percent of the world's rice. More than half of the world's population has rice as their main diet which accounts for 20 percent of global calorie intake. China, India, Indonesia, Bangaladesh, Vietnam and Japan are the major rice growing and consuming countries. Rice consumption is on increasing trend in poor Asian countries while it is on decreasing trend in countries were the percapita income is high. Crops which are nutritionally better than rice like small millets are given more attention today by the research organization to meet the future food and nutritional needs. Yet, rice will occupy a significant position in meeting the calorific and food needs of future generation.

With respect to India, in 1990-2010 the food grain production in the country grew at an average 1.4 per cent, whereas the population growth was at 1.6 per cent. Fortunately, we have achieved a food surplus during last two years. But in the long run, concern of food security is likely to become more intense with increasing population and decreasing land availability. By 2020, to meet the food demand of 1.3 billion populations, India needs to produce 281 MT of food grains with an annual growth target of 2 per cent.

The name of the grain used globally, rice, probably has its roots in India. According to the Microsoft Encarta Dictionary (2004) and the Chambers Dictionary of Etymology (1988), the word 'rice' has an Indo-Iranian origin. It came to English from the Greek word óryza, via the Latin oriza, the Italian riso, and finally the Old French ris. It has been speculated that the Indo-Iranian word vrihi was itself borrowed from a Dravidian word vari or even from a Munda language term for rice; the Tamil name arisi could have given rise to the Arabic ar-ruzz, from which the Portuguese and Spanish word arroz originated (http://en.wikipedia.org/wiki/ Rice).

Rice Cultivation systems

Rice can be classified based on the area in which it is grown as Irrigated rice (lowland rice), rainfed lowland rice and rainfed upland rice (dryland rice). Apart from this deep water rice or floating rice or coastal wetland rice do occur. Rice is cultivated in both irrigated and dryland conditions. 75 % of the rice cultivated in the world comes from 80 million ha of irrigated rice.

Irrigated rice in grown in bunded fields, which ensures stagnation of water to a height of 5 to 10 cm to facilitate rice growth. Usually the seeds are raised in nursery and get seedlings get transplanted. Irrigated rice is sown in areas where the water is assured through perennial/ seasonal rivers and bore wells. Irrigated rice is grown as

mono crop even two or three crops get sown in a year, which in turn depends on the water availability.

Dryland rice (upland rice) and rainfed low land rice is grown in over 74 million ha across the world, but contribute only to 24 % of the global rice production. This dryland rice depends entirely on the rainfall in the area whereas lowland rice is supported by local irrigation systems like village tanks and ponds.Aas the rainfed rice is subjected to multiple abiotic stresses due to uncertainty of rainfall, the yield is very much lesser than irrigated rice.

Both floods and drought , especially during the critical crop stages of paddy (tilling, flowering and milky stage) will have drastic impact on yield of paddy, sometimes even resulting in complete crop failure. The dry land crops are more prone to failures than wet land rice.

In dry lands paddy seeds are either broadcasted (direct sowing) or sown behind the plough. Broadcasting of sprouted seeds of paddy is also practiced in some places. In Austraila, most of the rice gets broadcasted through aircrafts through experienced agricultural pilots , who use satellite information for uniform broadcasting of seeds.

Rice in India

Rice is first mentioned in the Yajur Veda (1500-800 BC) and then is frequently referred to in many Sanskrit texts, which distinguished summer varieties grown in the rainy season from winter varieties. Shali or winter varieties were the most highly regarded in times past. The name of Annapurna, the Hindu god of rice, comes from the Sanskrit word for rice, anna. Rice cultivation started in Ganga river basin by 2000-1500 B.C and later extended to other parts of the country. India has rich biological diversity with respect to rice.

According to Dr. R.H. Richharia, one of the most eminent rice scientists of the world to date, 400,000 varieties of rice probably existed in India during the Vedic period. He estimated that even now, as many as 200,000 varieties of rice exist in India. Today rice is grown in 545 out of 604 districts in the country and 70 % of its people rely on rice to meet 43 % of their calorific needs. India is the second largest producer of rice next to China and provides around 20 % of the global rice production from its 45 million ha under rice. It contributes to 44 % of the total food grain production in the country. Green revolution enhanced the productivity of rice in India through introduction of new short duration, fertilizer responsive HYV, which however is not free from its de merits like extinction of traditional varieties from cultivation, which had high potential to withstand drought and other climatic stresses. In India rice is grown under irrigated, rainfed, coastal conditions and also as deep water rice in two major seasons (Kharif- June-Oct) and Rabi (Oct- Feb).

Significant Impact Events of Rice In India	
1906	Introduction of Single Seedling Planting in Madras Presidency
1911	Introduction of Gaja Planting in Madras Presidency
1912	Beginning of systematic study on rice in Coimbatore
1946	Establishment of the Central Rice Research Institute at Cuttack
1951	Introduction of the Japanese method of rice cultivation
1965	Launching of All-India Coordinated Rice Improvement Project (ICAR)
1969	Introduction of IR8 variety, surge in expansion of rice area in Punjab
2000	First evaluations of SRI, followed by trials in other states
2006	First National SRI Symposium in Hyderabad, followed by annual symposia in Agartala (2007) and Coimbatore (2008).

Issues in Rice Cultivation

Globally rice cultivation is under stress and India is no exception. Growing need to feed the billions, changing temperature, water issues (availability, quality and effective usage) , fragmented and less fertile lands (modern varieties exploiting the nutrients in the sil to greater extent than the traditional varieties), shrinking of area under cultivation, Labour issues, environmental problems and no drastic improvement in productivity in recent years are the factors which remain as a threat to enhance rice production.

Among all exploitation of water resources by agriculture and industries, is growing at an alarming rate by more bore well being dug at deeper depths, while recharge

of the same is occurring at a very lesser phase due to inadequate rainfall in recent years will affect rice cultivation drastically. The Cauvery delta which is known as "grainary of Tamilnadu" which used to grow paddy for at least two subsequent seasons every year before three decades is now struggling to raise paddy for one single season due to late set of monsoon and inadequacy rainfall. The Indian states and its farmers were fighting with each other for their right for water, the situation forced by the large scale exploitation of water and inadequate planning to use the water resources in right way. On the other hand the village tanks and ponds which used to be maintained by the community itself, now has become the responsibility of the government, which has failed to maintain them properly, leaving them damaged and encroached.

With respect to productivity though we pat ourselves on our back for the results of green revolution, the bitter truth is we are far behind in rice productivity than many other countries. Though we produce 4.5 times more than what we produced 50 years ago, rice productivity in India is only 3.3 tons/ha whereas China has a productivity of 6.6 tons/ha, twice that of India. We lag behind the productivity of rice 3.70 – 8.00 t/ha achieved by some of the countries like Egypt, China, Japan, and Korea.

We have a challenge ahead. We have to increase the productivity of rice so that the total rice production stands at 140 million tons by 2025. With fixed land resource and declining water resource this is indeed a great task. Increasing the productivity without damaging the fertility, organic and microbial load in the soil and with most efficient means of using water is the need of the hour. The recent development and focus on SRI method of paddy cultivation, however shows some scope for achieving the task.

Traditional cultivation practices in rice

Rice is a high input crop. It needs more water than any other crop, needs a fertile land and also good temperature for adequate growth. It is extremely sensitive to water shortage. It is estimated that to produce one kilogram of rice requires 3,000-5,000 litres of water. Evidence shows that the irrigated rice receives 34-43 per cent of the world's irrigation water (Bouman et al, 2007). Rice is wetland in grown mostly in stagnated water condition and the irrigation practices followed by farmers particularly in Asia, does not ensure water use efficiency. Improper water management practices have led to wastage of water in many of the cases etc., transportation losses, evaporation losses, seepage and percolation losses and excess irrigation are very common in irrigated rice cultivation.

Also rice is grown by small and marginal farmers in fragmented piece of lands ranging from 0.5 acre to 2 acres, which remains as a hurdle to practice improved water management techniques. Though agricultural universities and research institutes suggested many water management techniques, they failed to gain the attention of farmers because of the difficulty in implementation and also partly because of neglect ion/ hesitation of farmers to adopt new techniques.

Generally inappropriate practices farmers follow in cultivating irrigated paddy range from usage if higher seed rate and less quality seeds, no seed treatment, transplanting at a later date than at appropriate time due to labor and water shortage, planting more seedlings per hill (usually 4-6 seedlings), closer spacing than recommended and sometimes even do random planting without following line spacing, excess irrigation of the land when water is available in adequate quantity and inappropriate pest and nutrient management practices. The local fertilizer dealers also have a hand in forcing farmers to use excess and unwanted fertilizers or nutrients.

However the System of Rice intensification (SRI) introduced in India by Tamilnadu Agricultural University in 2000 through their collaborative research efforts gained the attention of farmers since it not only saved water but also ensured a higher yield of over 1.5 tons/ha. Various civil society organizations also took interest in the concept and started promoting it.

SRI methodology of Rice cultivation

The SRI method of paddy cultivation currently practiced in more than 40 countries, originally was developed by French Priest Henri de Laulanie in Madagascar, who worked along with rice farmers of Madagascar for almost 30 years, before announcing this system to the world. It is a farmers centered invention which focuses on changing the normal agronomic practices in rice cultivation for better yield.. The main feature of the method is raising raised bed nursery, transplanting

young 8-10 day old seedling with a wider spacing, maintaining water to saturation level, weeding and incorporation weeds in the soil and application of organic fertilizers. The above techniques if food to save water considerably, apart from increasing its yield considerably. The technique however was discovered accidentally when Henri de Laulanie was forced to expand the area under paddy for demonstration in a school, for which he used younger seedlings of paddy which are 15 days old along with older seedling which are 30 days old (which itself is a deviation from normal practice of transplanting 60 days old seedling).

The result was astonishing that the younger seedlings started producing more tillers and later contributed to substantial increase in yield. Laulanié and others started analyzing the reason and found solid reference that rice planted at early stage before the start of fourth Phyllochron while preserve its growth potential and triggers it to produce more tillers. As a follow up of these numerous studies and trials were taken up by research scientists, farmers and civil society organizations, which showed very clearly that by changing some of the basic agronomical practices the yield of paddy can be considerably improved even to a tune of 8 tons/ha.

The general agronomic practices like raising nursery, land preparation and puddling of land, transplanting of seedlings, irrigation, nutrient, pest and disease management are all there in SRI but with striking changes in the way in which they are carried out.

SRI Principles

The System of Rice Intensification involves cultivating rice with as much organic manure as possible, starting with young seedlings planted singly at wider spacing in a square pattern; and with intermittent irrigation that keeps the soil moist but not inundated, and frequent inter cultivation with weeder that actively aerates the soil. As Father de Laulanié observed, SRI is an nothing but an amalgamation of multiple beneficial agronomic practices rather than a standardized technological method.

The main operational elements of SRI, each having good agronomic rationales, are:

1. **Young seedlings:** If establishing the rice crop by transplanting, start by using single seedlings preferably 8 to 12 days old, and certainly less than 15 days, i.e., before the start of the 4th phyllochron tillering in rice plant will be extremely well, the seedlings being able to deliver its full potential for development. The objective is to preserve the plants' vigour and growth potential for tillering and root development which is forfeited by using older seedlings beyond their 4th phyllochron of growth (Stoop et al., 2002).
2. **Careful transplanting of single seedlings:** The transplantation shock will be more for younger seedlings which can be overcome by following some strict procedures while transplanting. Instead of transplanting 4-6 seedlings which is a normal practice, only one single seedling which is younger than 12 days must be transplanted within 30 minutes after the seedling is removed from the nursery. This must be done with much care that the soil and seed sac attached to the root are intact. The roots should be at shallow depth of 1-2 cm, without damaging the root tips, as it will cause set back in immediate recovery of the seedling and may affect its growth. The seedlings should be pressed too much so that the root tip does not get curved upward (U shape) but just remains in 'L' shape. To achieve this land should be leveled properly without any undulations.
3. **Wider square spacing:** Since the tillering will be more than normal when younger seeds are transplanted, more spacing will be required for good growth of roots and canopy. Through experiments it was found that a spacing of 25* 25 cm in square fashion gives a yield increase of 80-90 % in fertile soils. In less fertile soil the spacing can be 20*20cm. But since other practice in SRI facilitates enhancement of soil fertility through root exudation and additions of organic matter, the fertility of soil will get improved and accordingly the spacing can be increased later. The higher yield from reduced population is due to increase in panicle-bearing primary tillers per unit area, more spikelets and filled grains per panicle, as well as higher grain weight.
4. **Water management:** Paddy fields in common practice are maintained in water stagnated condition, since it can withstand excess water but not the lack of water. But this flooded condition is not favorable for root growth and 75 % of paddy roots will remain in the top 6 cm of soil, in a month after transplanting. Such shallow roots fail to extract nutrients from larger volume of soil, increasing the dependency on

inorganic fertilizers. This will have a direct effect on the yield of the crop. FIooded fields also have a inhibiting effect on aerobic soil organisms that support N and K fixation and absorption respectively.

Rice consumes three times more water than wheat and other like cereals, under current water management practices, which is justified with the belief that rice needs more water. Aerobic soil conditions and at the same time adequate amount of water to paddy can be ensured by supplying small amounts of water daily, with several periods when the field is allowed to dry for 3-6 days during the vegetative growth stage, or by alternate wetting and drying (AWD) with cycles ranging from 6 to 14 days.

The alternate wetting and drying of soil is proved to be beneficial since it is found through various experiments that

- ⇨ Air in the soil is as important as water, and water and air should alternately enter, drain, and leave the soil;
- ⇨ There should be optimum warmth in the soil for proper growth of the crop, for which there should not be water in the soil all the time;
- ⇨ With the reduced irrigation, the water saved can be used for 5 times more area from available water sources; and
- ⇨ It is incorrect that rice requires standing water all the time.

In Tamil Nadu, the water management for SRI is prescribed based on field experimentation. Up to panicle initiation stage, it is recommended to irrigate the field to 2.5 cm after the previously irrigated water disappears and hairline cracks develop. After panicle initiation, irrigation is done to 2.5 cm depth one day after the previously ponded water disappears from the surface. At the hairline cracking stage, soil will not be dry, but it will still be moist.

Irrigation intervals vary with soil texture. Fine-textured clayey soils with higher field capacity need irrigation at longer intervals, while coarse-textured light soils with lower water holding capacity require irrigation at closer intervals, consuming in the process more quantity of irrigation water. Such shallow irrigation can save water up to 40% and there will not be any yield loss due to this.

5. **Enhancing soil aeration:** Apart from through water management, SRI also tries to improve soil aeration through other mechanical measures. When paddy soils are not kept continuously flooded, the condition becomes more favorable for weed growth. This can be turned to advantage by using soil aerating hand weeder, which when used aerated the soils and at the same time ploughs the weeds insitu and makes them decompose. Doing mechanical weeding at 10-12 days of transplanting and subsequently 3 to 4 times is recommended, which will enhance the soil health, soil porosity, improve nutrient cycling and solubilization through microbial activity.

6. **Nutrient management:** Modern varieties are highly fertilizer responsive varieties and the application of farm yard manure, green manure, tank silt to crops is on reducing trend, which again is due to various factors like non availability, higher cost (transport cost usually) etc., However the world has realized that inorganic fertilizers are incapable of retaining the soil health and fertility, which will have a long term effect on the yield and productivity of the land. So far, no specific nutrient management recommendations have been made for SRI crops. SRI is not necessarily an 'organic' management strategy.

The soil environment created by SRI's wider spacing of plants, its un flooded water regime, and the churning up of the soil by weeder use are found to encourage a different microbial and nutrient dynamics in the soil. Continuous application of organic matter in the form of compost, farmyard manure, and plant residues is needed to maintain or increase soil organic carbon. Soil organic carbon levels are a good indicator of native fertility. In general, paddy soils are fairly poor in organic carbon (~ 5 g kg-1).

Thus, it is essential to use more organic biomass with most soils to achieve and sustain good fertility status. Soil organic matter increases the microbial load in the soil, which in turn supports nutrient absorption and utilization by the crop. However use of inorganic fertilizers may be as effective as use of organic fertilizers when other SRI techniques are properly followed. But it is preferable to follow a combined nutrient management strategy, based on the fertility of the soil where the rice crop is grown.

SRI Not suitable for

Saline Soils

Saline or alkali soils are not suitable for SRI cultivation. In saline soils paddy yields would be satisfactory when it is cultivated under flooded conditions. But in SRI method the field is drained intermittently. When soil is allowed to dry the salts accumulate in the surface resulting in damage to the rice plant.

Undulating plots

Land selected for SRI method should be level. When the plot is irrigated the water should spread uniformly across the field. Similarly, whenever needed there should be facility to drain the excess water.

Infertile soils

Soils which are less fertile or made sterile by continuous use of inorganic fertilizers in large quantities, will not yield expected yield through SRI. In such cases supplementation with organic manures will be of useful, and in long run it will start providing the desired yield.

Will the dream come true?

The idea of producing more with fewer external inputs which sounds impractical, is proved to be working in the case of systematic rice intensification technique. The idea and concept of SRI has caught up the attention of research institutes and voluntary organizations worldwide, which try to replicate this with other crops like wheat, rainfed rice, sugarcane, finger millets, rape seed and solanaceous vegetables.

The news from states like Tamilnadu, Bihar, Orissa and Mizoram which achieved a tremendous success in rice production by adopting SRI is promising. In fact a farmer Sumant Kumar from Darveshpura village, Nalanda District of Bihar, now is the proud owner of world record in rice production with 22.4 tons/ha surpassing the record of earlier record of 19 tons, held by a Chinese farmer. He has adopted SRI method of paddy cultivation in rasing the hybrid variety Arize 6444 Gold by Bayer. However the technique is not free from criticism who doubt whether SRI is really a revolution or just an illusion. Also there are many factors which may hinder large scale adoption of this technique

1. Transplanting small and young seedlings is not possible in all lands, especially in lands where the drainage is impossible. This increases the risk of prolonged submergence and mortality.
2. Transplanting small seedlings, that too single seedling in lines with much care is a tedious work. In a growing labor constraint situation, it will be very difficult to find labor in many states for such a tedious operation. Much caution also has to be exercised in land leveling to ensure growth of younger seedlings without transplantation shock
3. Critics though agree that wide spacing will encourage root development, they doubt that whether such increase in root biomass per surface area is superior to that obtained in densely planted crops. Further, they say that spacing recommended in SRI is not applicable to all varieties, and for some spacing may be too wide to assure optimal leaf canopy closure. Crop spacing hence can be varied according to the variety, type of soil and its fertility and climate
4. The concept of more tillers per plant is good, but its significance and superiority over grain formation and grain filling than dense population is further to be researched.
5. Availability of organic matter is a constraint in many areas, since cattle population has greatly reduced after mechanization. The process is also expensive and labor intensive, especially the transport cost incurred in applying bulk quantities.
6. There are practical constraints in following alternate wetting and dying techniques. While it can improve water use efficiency, in order for them to be practiced under real-farm conditions, all farmers within an irrigation perimeter should work collectively to avoid problems to others field.
7. More spacing and reduced irrigation favors higher weed growth. Though SRI advocates regular manual weeding and ploughing them in situ, it increased labor requirement.
8. Further more research is needed by the scientific community to support the claims of SRI.

The success stories of SRI should get reflected in the national and global productivity, which is possible only through large scale adoption of this technique with suitable precautions and changes to suit the local needs. Only then SRI can become effective in addressing the future food needs. □

Experience on Fish Rearing at Manamadurai block

Location background

Manamadurai block is located on the southern part of the Sivagangai district. Bounded on the North by Sivagangai block, East by Ilayangudi block, South by Paramakudi (Ramanathapuram district) and Narikudi block (Virdhunagar district) and west by Thiruppuvanam block. River Vaigai flowing from North West to South direction on the block areas. About 58% of the block area is found to be under agricultural land. Waste land and water bodies are found to cover about 25% and 15% of the block area respectively. In Manamadurai block, 39 Panchayats and 212 Hamlets are there. Manamadurai block have the 154 Union tanks and 91 P.W.D tanks. In Manamadurai block 12 Cascades are there. Paddy is the main crop and Sugarcane; other pulses are the secondary crop in Agriculture. Manamadurai is famous for Pot making and Charcoal production and bricks production activity. DHAN Foundation enters to Manamadurai block on 2005. Manamadurai block had received fund from ITC, FPARP, PHILANTHROPY, HUL funding agencies. Now 55 vayalagams, 35 MFG's, 2 cascades and 1 Federation was in Manamadurai block. In fish rearing, we have collaborated with KVk, Kundarakudifor fish rearing and capacity building of the members for the past 2 years and we had done the fish rearing activities with the available project funds.

Conservation and development works done includes farm ponds

In conservation and development works, we had done the following works,

- Deepening of tanks
- Rehabilitation of supply channels
- Reconstruction of sluices
- Deepening of drinking water ponds
- Creation of ponds

As on we had completed the conservation works as worth of Rs. 42 lakhs from different funding agencies. In Farm ponds, we created the 25 farm ponds for the purpose of irrigate the Agriculture crops and inland fish rearing.

Fingerlings

Normally we seeded the following fingerlings in our area

- Catla
- Rogu

Reach of Inland fishery year wise – 2008 to 2012

Table.1 Details of fishery in Manamadurai block

Nature of water bodies	No. of water bodies	Funded by	Year	Amount in Rs.
Ooranies	2	FAO	2007-2008	20,000
Farm ponds	2	ITC	2008-2009	5,000
Farm ponds	10	FPARP	2008-2009	20,000
Farm ponds	2	ITC	2009-2010	5,000
Tank &Ooranies	1	ITC	2010-2011	40,000
Farm ponds	5	KVk, Kundarakudi	2011-2012	5,000
Farm ponds	5	KVk, Kundarakudi	2011-2012	5,000
			Total	**1,00,000**

- Mirgal
- Common carp

Water availability

In Manamadurai block, rain water is available for 4 to 6 months in tanks and ponds based on the rain fall.

Issues and challenges

- In Farm ponds level, the owners are not feed regularly
- Because of drought, they used the pond water for irrigation only
- In common tank, the problem occur when getting of Panchayat agreement from the panchayat
- In common tank, Monitoring is a problem.

Case Studies

1. Farm pond – a livelihood

T. Anjumani is a farmer. He is living in the village of Somathur; it is in the Chinnakannanur Panchayat, Manamadurai block and Sivagangai District. He is the member of Manamadurai Vattara Vayalaga Oruginaippukulu. He is having the cultivable land as 3.5 acres. His land is situated at tail end of the somathur tank. He cropped Paddy in variety of IR 36 crop every year in this land depends on tank and rain water. In some years, they had cultivated the paddy in less growth due to less rain. In the year 2008-2009, we (DHAN Foundation) approached him for vayalagam (Farmers Association) formation and creation of Farm ponds and Tank conservation works related. That time, he had interested in Tank conservation works through the association. And he tried to form the association, but the villagers are not accepted. And also he is not interested to do the farm pond works; he does not want to use his land for farm pond creation. In same year, rainfall is less and due to this reason and also land situation as far from the tank, his entire crops had failure. He did not cultivate the crop.

Sl. No.	Income	Rs.	Expenditure	Rs
1	Fish rearing	7,500	Feed	2,000
			Catching the fishes	800
		7,500		2,800

So the farmers got Rs.4700/- from this fish rearing activity.

Creation of farm pond

In the year, 2009-2010, we approached him for association promotion. At that time, he knows the importance of Farm pond. He tried to promote the association, due to some issues in the village, they are not agreed. Then he wants to do the farm pond work through our intervention. He had joined a member in Manamadurai Vattara Vayalaga Kootamaippu. We had done the farm pond work through the funding from ITC-MSK and Mr. T. Anjumani Participation. For this work, total estimate is Rs.28,000/-, from this RS.20,000/- is ITC contribution and Rs.8000/- is farmer contribution. In this work, we had done the earth work as 720.38 m3, and inlet work and the total expenditure is Rs.28,451/-.

Impact of farm pond

After the Rainy season, the farm pond had filled. The Farm pond had stored the 7,20,380 liters of water. He prepared the nursery for paddy crop on time, before of villager's preparation. He was transplanted the seedlings in first from the villagers. He had cultivated the Paddy in his land with full growth. He had cultivated the crop in 2.5 acres with 30 bags /acre by used the irrigation water from Tank and farm pond.

Fish rearing

And also he had done the fish rearing activity by used the water from Farm pond. He had seeded the fish finger lings as 1000 on 31-12-2010 to his farm pond. Due to continuous rain, he did not able to cultivate the fishes. On 15-05-2012 only he had cultivated the fishes. He got 75 kgs of fishes from his farm pond. Each variety weight has ranges from 5 to 6 kgs. He purchased the fishes as Rs.100/Kg to the villagers only.

2. Fish rearing at Kulaiyanur village

In Kulaiyanur village, the two supply channels of Kulaiyanur tank had desilted by the

Kulaiyanurooranivayalga members through the ITC fund as worth of Rs.185200/- Last 10 years the tank had not filled, due to siltation of channels. Yearly once through Siramadhan, the villagers had desilted the channels, but they are not desilted that much. Through our intervention, we desilted the channels as nearly 6000 m3 and this year tank gets more water. This year during the North East monsoon, the tank gets full water and surpluses two times. The command area crop (Paddy) also in good condition and cultivated the paddy as 30 bags per acre. Last year, they had cultivated only 20 bags per acre. And also they had done the fish rearing activity in this tank through our work.

In this activity, they had spent Rs. 40000/- and they got Rs.47000/- profit from cultivated fishes. They used the money for the oorani renovation work at this village. For this oorani work total contribution is Rs.62500/- and remaining amount they had collected from each farmer. That oorani work also completed.

Through this fish rearing activity,

- 20 farmers worked as a labour for harvesting and watching works
- Each family get 1.5 kgs of fishes as free of cost during last cultivation. □

Little Millet- Recipes

Little Millet Upama

Ingredients: Little millet rice 100 g, onion 25 g, green chillies 2 nos, vegetables 50 g (optional like peas, cauliflower, cabbage etc), mustard and cumin seeds½ tsp, bengal gram dhal ½ tsp, ground nut 2 tsp, black gram dhal ½ tsp, oil 25 ml, curry leaves few, coriander leaves few and salt to taste.

Procedure: Roast little millet rice with little oil on a low flame & keep it aside. Heat oil in pan and season with mustard seeds, cumin seeds, black gram dhal, bengal gram dhal, groundnut, curry leaves, chopped green chilly and onion. To the seasoned mixture add 3 cups (750 ml) of water and boil. Add salt to taste to the boiling water and add roasted little millet rice & mix well. Close a lid and cook for five minutes or till it becomes soft on a low flame. Add coriander leaves for garnishing and serve hot.

Total yield: 300 g/3 katories No. of Servings: 03

Little Millet Khichadi

Ingredients: Little millet rice 100 g, green gram dhal 50 g, oil 20 ml, black pepper 4-5 no, mustard seeds ½ tsp, cumin seeds ½ tsp, green chillies 2 no, turmeric a pinch, curry leaves few, salt as per taste.

Procedure: Roast little millet rice on low flame. Add little millet rice and green gram dhal to 300 ml of boiling water and cook till soft. Add salt, black pepper powder and mix. In a pan heat oil and season with mustard, cumin seeds, green chillies, curry leaves and turmeric. Add the seasoned mixture to the soft cooked mixture and mix well. Serve hot.

Total yield: 500 g/4 katories No. of Servings: 04

Little Millet Pulav

Ingredients: Little millet rice 100 g, carrot 25 g, cabbage 25 g, germinated moth bean 10 g, onion 20 g, garlic 2 piece, green chilies 3-4 no, ginger ½ inch, ghee 2 tsp, cardamom 2, clove 4, cinnamon ¼ inch, cashew nut 3-4 nos, raisin 8-10 nos, oil 15 ml, coriander leaves few, salt to taste, water 400 ml.

Procedure: First fry the cashew, raisin in a 2 tsp of ghee and then fry little millet in ghee and keep it aside. Then finely chopped green chilies, onion, cabbage and grate carrot. Make a paste of ginger, garlic coriander leaves. Then take a pan and keep oil for heating, add cardamom, cinnamon, and clove. Then add onion, green chilies, and fry it for a second. Then add ginger, garlic, and coriander leaves paste to that and stir with spoon for some time. Add grated carrot, cabbage, germinated moth bean and fry it for a minute. Then add 400 ml of water and salt to taste and boil it. Then add fried little millet rice to the boiling water and mix it thoroughly, cook it soft. To this add fried cashew, raisins and mix it.

Pulav is ready to serve. □

India Water Week 2013

India Water Week is a key annual policy and technology showcase event organised by the Ministry of Water Resources, Government of India in partnership with public, private and non-profit organisations working on the issues of Water. National Water Development Agency and Central Water Commission have jointly anchored the India water week 2013 at Vigyan Bhawan, New Delhi between 8 and 12 April 2013 on the theme "Efficient Water Management: Challenges and Opportunities".

A number of events including conferences and policy dialogues were organised on the topics relevant to the focus of the year. As part of this event an exhibition was organised by different stakeholders, who have showcased their experiences and contributions in the field of Water Management.

The event had international and national audience comprising of policy planners and technologists involved in water resources management in all key sectors like Agriculture and Irrigation, Energy and Industry and Drinking water supply. With all the collective efforts of stakeholders, the India Water Week 2013 was a huge success with 2200 registrations and over 200 technical papers presented and discussed.

DHAN Foundation, which has been working for more than two decades on the theme of Water, made its presence in the India Water Week since its inception. In 2012, DHAN Foundation organised a seminar on the theme of "Water bodies (Irrigation tanks): Sustaining Food Security and Honorable minister for Rural Development Shri. Jayaram Ramesh felicitated the event and released "Manual on Ahar Pyne Rehabilitation at South Bihar".

This year 2013, a team of Professionals from DHAN Foundation has attended the event and presented papers on the grassroots experience in water conservation and development. Also they presented three posters, which were displayed in the exhibition hall throughout the week. DHAN's experiences in water conservation and management were displayed at the Exhibition. Honorable water Resources Development Minister Shri.Harish Rawat visited the stall and interacted with the team of professionals from DHAN. The details of papers presented in the forum were given as:

- Mr. A. Gurunathan, Chief Executive of DHAN Vayalagam (Tank) Foundation made a poster presentation on "Used water and scope of DEWATs, Learning from pilots in Madurai"
- Mr. R. Venkatasamy, Programme Officer, DHAN Vayalagam (Tank) Foundation presented a paper "In search of ways water for improving the tank irrigation systems"
- Mr. N. Venkatesan, Chief Operating Officer, DHAN Vayalagam (Tank) Foundation made a poster presentation on "DHAN Foundation's experiences on Efficient Tank Irrigation Management through Traditional Water Managers through Traditional Water Managers in South India: Challenges and Opportunities"
- Mr. Sadasiva Bitra, Team Leader, DHAN Vayalagam (Tank) Foundation presented a paper on "Restoration of traditional water resources (Lakes with local participation for coping up with climate changes)"
- Mr. N. Rajasekaran, Team Leader, DHAN Vayalagam (Tank) Foundation made a poster presentation on "Securing water in tank based watershed development for agriculture livelihood in Gundar basin, Tamil Nadu". □

Field Notes - Climate Change

Farm pond to mitigate saltiness of well water

Our well water is salty and affects the yield of crops. Paddy crops have gone chaffy due to insufficient and salty water many a times.

I have constructed a farm pond now, hoping that I can mix water from farm pond with the salty well water to irrigate crops. By mixing so, the effect of the salt can be reduced to great extent

-Selvi W/o Murugan, 30 years,
K.Chattirapatti

Microfinance and RBI Monetary Policy: 2013-14

M.Kalyasundaram*

Policy suggestions of INAFI India

This is a policy note prepared by International Network of alterative financial Institutions, India to RBI for creating a facilitating environment for microfinance based credit instituions. The note stress the importance of SHG bank linkage as an effective means of financial inclusion and suggest some policy changes that will facilitate reaching of credit to the most disadvantaged section of the society. Recommendations for supporting promotion of agriculture based producer companies by making the credit more accessible to the small and marginal farmers for such activity was also made through this note.

Waning enthusiasm for SHG Bank linkage – counter-productive for financial inclusion

There has been a general acknowledgement about the strides made by the self help groups in South India in terms of their advancement, higher level of Bank linkage, etc. The reality now, however, belies this impression and an atmosphere of avoidance or even denial is prevailing for the SHG for linkage.

The KYC norms have increasingly been used as an instrument in this process and a case in point is that even very recently the RBI has been compelled to step in to issue policy guidelines on the KYC norms for SHGs for opening accounts and credit linkage, being a basic issue being addressed after almost two decades of SHG banking.

Some Banks have even resorted to sophisticated method of rating which is absolutely inappropriate for the informal groups of poor women who may not have sufficient functional literacy about the financials and other related matters.

Therefore, to reverse the slackness and apathy which is now creeping in quite large way, we would like to reemphasize our suggestions to put in place district level monitoring mechanism under the aegis of RBI which will play an enabling and smoothening role.

To make sure that this process is monitored and smoothened at the district level, the three functionaries from Banking and regulatory side – the Lead Bank, the District Development Manager of NABARD and the concerned Lead Bank Officer from Reserve Bank of India should be charged with this responsibility and the mechanism institutionalized as a distinct financial inclusion promotion and monitoring process of DLCC.

This monitoring process at district level would be able to ensure that no eligible groups would go unlinked with the nationalized banks/RRBs/Cooperative Banks. This timely linkage through monitoring would also serve as an incentive to the SHGs to function better with financial discipline.

Cash margin as impediment for credit flow to not for profit MFIs

SHG Bank linkage has been witnessing none too impressive progress in Northern states of India due to several factors including attitudinal issues and problem of staff shortage. The BC/BF model has also not been widespread and a few have been effective. Given this scenario, MFIs chip in and play a complementary role in extending credit.

There are many MFIs – small and moderate sized in the not-for-profit /non-commercial mode effectively bridging this gap to certain extent. The major constraint is that Commercial Banks have not been forthcoming/ reaching out to such MFIs and they are struggling to have access to funds.

Given the huge shortfall in DRI lending the resource allocation from Commercial Banks to these not-for-profit MFIs reaching out to the poor need to be encouraged and stepped up as a package without regard to the capital leverage ratio but on the strength

***Mr.M.Kalyasundaram,** Chief Executive Officer, INAFI-India

of number of SHGs and their effective demand. For, far too long, these not-for-profit MFIs are languishing without adequate funds and support to them would be a direct contribution to the financial inclusion process.

Of late, Commercial Banks have now started insisting on cash margin of 10% of the credit limit sanctioned which is a impractical condition to comply with for the 'not for profit' MFIs to mobilize. Cash margin has become an impediment to access credit from the Banks and reach out to poor clients in far flung areas. The credibility of MFIs, strength of social capital (quality SHGs and their processes), savings of the SHGs should be the criteria to extend credit rather than cash margin.

Rating of Community based not-for-profit MFIs

Same set of yardsticks won't fit the bill

In the light of the RBI guidelines from the perspective of capital adequacy for the Banks, all credit lines above 5 crores have invariably face the compulsions of going for rating and microfinance institutions seeking higher linkages above 5 crores are no exception and all Commercial Banks invariably insist on ratings.

Be that as it may, microfinance being purveyed by different kinds of institutions some purely commercial and some social with even ownership of communities (being clients). Yet, the parameters that are applied to assess the financial and other aspects of the MFIs by the rating agencies have been evolved purely from the commercial criteria or perspectives and the same set of parameters are reckoned for community owned MFIs without due regard to compelling differentiation in assessment methodologies.

Such methodology of assessment ignores many special characters and features of such community owned MFIs and thereby such MFIs end up getting unfair deal in rating and thereby resulting in denial of credit linkages by the Banks. We have been, for long, seeking for waiver of the rating for the community owned MFIs and in the given circumstances of policy framework for rating, we need to evolve an assessment with different set up criteria for community owned MFIs rather than stereo type. We urge upon the RBI to consider this suggestion for appropriate rating of community owned MFIs and facilitate smooth access to credit from Commercial Banks for such kind of community owned MFIs.

Producer companies of small and marginal farmers – need for access to credit without collaterals

With the revised priority sector norms, the emerging producer companies are having an enabling framework to access credit under direct and indirect Agriculture for various purposes – be it production credit, investment credit, etc. This policy intent has not moved forward to help the intended constituencies and there is a road block in the form of collaterals being insisted upon from the producer companies. While the producer companies of big farmers would be in a position to offer such collaterals, **the producer companies of small and marginal farmers are not able to offer collaterals as they do not have any property or assets, etc., being vulnerable poor.**

While the recent budget proposal for the guarantee mechanism is welcome, given the practical difficulties, producer companies would not be able to access this facility and it may take more time to stabilize. By that time many producer companies which are currently languishing for want of access to credit would have really given up and gone back to square one. RBI would do well to goad the Commercial Banks and even NABARD for that matter to take an empathetic view of their handicaps to offer collateral and reach out to support the producer companies.

After all they are small and their requirements are also small and there is an urgency to ensure credit flow to these companies. These are all early days for producer companies and there are not many in vast country like India and if they get a message that their genuine requirements are denied, the whole policy initiative on the producer companies and the priority sector lending norms would be in vain.

We would also like to suggest that they are in a stage like SHGs in the early 90s in the formative years and they require hand holding support of not only for the enabling institutions of NGOs, civil societies which helped in promotion of these producer companies but also financial institutions. **RBI could support this process by taking a reality check in their outreach programmes.** This gesture would go a long way to facilitate the process of linking the producer companies with Banks and NABARD. □

Observation on Vaigai Conservation Campaign

N.Venkatesan*

The Vaigai is 258 kilometres (160 mi) long, with a drainage basin 7,031 square kilometres (2,715 sq mi) large. The river Suruliyaru, the river Mullaiyaaru, the river Varaganadhi, the river Manjalaru and river Kirudhumaal are the major tributaries of river Vaigai. . All these rivers, except Kridhumaal join with the great Vaigai river nearer to the places around the Vaigai Dam which is situated in Theni district, whereas Kridhumaal joins Vaigai in Madurai.

Vaigai gets major feed from the Periyar Dam in Kumuli, Kerala state. Water from the Periyar River in Kerala is diverted into the Vaigai River in Tamilnadu via a tunnel through the Western ghats. In summers, the Vaigai river ends up dry very often. The water never reaches Madurai, let alone flowing into places past Madurai. The Vaigai river presently remains in a most polluted condition and DHAN Foundation has launched Vaigai conservation campaign to protect the river from further degradation and also to educate the common public to support the processes of cleaning and renovating the river.

As a part of the campaign Kadamalaikundu Vaigai Conservation campaign was held on 7th March 2013 during the eve of the Vayalagam Movement day Celebration. The Regional team at Theni headed by Ms.Ambika and Mr.Murguganandham of Vayalagam team made the arrangements for the campaign and ensured that the event is held in a grant manner. More than 150 members from Vayalagam movement and 150 members from Kalanjiam Movement participated in the event.

The event was organized at Vaigai River bed at Vellimalai Pudur pirivu. The purpose of the event and the urgent need for conserving the river was explained to the people. The Vayalagam movement knowing the significance of the river and which was much worried at the present state of river, decided to create awareness and concern among the people living in the banks of the river to protect it and educate them not to use the river as a dumping yard of waste. Shramdhan was held as a part of the event in which all the members gathered participated actively. Followed by the Shramdhan, the Vayalagam and Kalanjiam members went as a rally from Vellimalai Pudur to Kadamalaikundu . They also raised slogans on the need for protecting and conserving river Vaigai. This rally attracted the general public in Kadamalaigundu, who stopped and watched the rally and also appreciated the effort.

Another significant achievement of this event is the active participation of the Kadamalikundu Gramma Committee. The committee expressed that it is the need of the hour to protect the river Vaigai and also they assured that they will support the Vayalagam and Kalanjiam movement on any events organized with the aim of conserving river Vaigai. They also assured to contribute some amount to meet a portion of the campaign expenditure. To continue this effort they said that they print and distribute leaflets regarding the need for conserving river Vaigai at their own cost and requested for content support for the same.

The BDO of Kadamalaikundu who participated in the event, got exited by this initiative and assured the local team that the block office will take steps to dig a choke pit using excavators for safe disposal of waste water and solid wastes. The Assistant Executive Engineer, Public Works Department, Theni also attended the event . He explained about the initiatives taken by the department to protect the rive and also the future plans for river conservation.

In the meeting, the resolutions were passed to conserve river Vaigai and also to enroll all the villages in the bank of river Vaigai in Kadamalaikundu and Aandipatti to initiate similar such campaign. As a result of the Shramdhan during the event, a choke pit was created in the Vellimalai Pudur Pirivu of Vaigai river and all the drainage water which hitherto flowed everywhere will now get collected in the pit and the villagers felt happy at the initiative. The Vayalagam movement members, Kalanjiam members and the regional team of DHAN also realized that any good initiative will bring support and sponsorship from all those who have real concern for benefit of the society.

***Mr.N.Venkatesan,** Programme Leader, DHAN Vayalagam (Tank) Foundation

Kottalapalli Vayalaga Raithula Sangam Conservation

P.Rajasekhar*

DHAN Foundation initiated the Tank program in the year 2007 with the support of Andrapradesh community based tank and water management program (APCBTMP). in three mandals viz. Kavali, Marripadu and Seetaramapuram of Nellore District, Andrapradesh. The objective of the program was to promote association of tank cascade farmers, who themselves will actively involve in preservation and maintenance of tanks in these mandals apart from remaining as a sounding board for practicing improved agricultural techniques. Incidentally as Udayagiri mandal remained the center for this mandal the location office was set up in Udayagiri.

Udayagiri mandal also had tanks, open wells and bore well as irrigation source. As the mandal did not get covered by the APCBTMP a project DHAN Foundation started implementing the tank program with the support of Bharat Petroleum Corporation Limited- Oil Indian Development Board) in the year 2010. With this support Vayalagam were formed in 9 villages of which 5 villages has both tank and wells as irrigation source (Pullayapalli, Ayyavaripalli, Kottalapalli,SV chintala and Gudinarava) and 4 were irrigated by open wells and bore wells alone (Bodabanda, Sakunalapalli,Annampalli and Dumpavaripalli). Tank renovation works, farm pond constructions and rejuvenation of open wells are being implemented currently in these villages.

Kottalapalli is a small village in Udayagiri under Gannepalli panchayat with only 37 families all of the same Naidu community. The village is located 11 km from Udayagiri. The village has one tank which has a command area of 20 acres, 40 acres being irrigated by open wells and borewells. Apart from this there are 30 acres of dry land with no source of irrigation and which depend entirely on rainfall. The villagers grow paddy, sunflower, millets, turmeric and maize.

Our efforts in Kottalapalli Village

In 2010 December, DHAN Foundation staff conducted the village level meetings in Kottalapalli to create awareness and education on Rain water harvesting, renovation of tanks, terms and condition for people contribution (people has to contribute 25% of the

estimation cost for any water harvesting works) and about BPCL-OIDB project. As these works cannot be sustainable without people support, lot of trainings were given to get community involvement and their willingness to provide the land for grounding the structures. Initially the villagers did not have belief in our efforts. After repeated attempts and after screening of films of our efforts in Punganur location, people got motivated and formed one village association with 47 members on January, 2011. This association was named as Kottalapalli Vayalaga Raithula sangam. The tank and open wells in the village were in a bad shape and the people expressed their need to rejuvenate them during the village meetings. The village had 10 open wells and the visits were made to the wells of which 3 were considered for rejuvenation. The farmers gave applications to Kottalapalli Vayalaga raithula sangam and each well was sanctioned Rs25000 and after getting 25 % people contribution to the Sangam

The case of an Open well

There was one Pata bavi (pata bavi- an old open well) in the village, the water from which was shared and used by four farmers, each owning 1.5 acres of land. The farmers were

1. CH.Chandranarayana s/o Naraiah
2. CH.Venkataiah s/o Ankaiah
3. U.Narayana s/o Pedanarayana
4. CH.Narayana s/o Chengaiah

***Mr.P.Rajasekhar,** Project Executive, Udayagiri Location

Table: Result of rejuvenation

Particulars	Before rejuvenation	After rejuvenation
Water level in the well	2 m	4 m
Land cultivated	2 Acre	6 Acre

Though six acres of land has to be irrigated, the open well had a water level of only 2 metres which was not sufficient to irrigate the entire six acres. Only 2 to 3 acres got irrigated each year and this is the situation for the past six years since 2011. They used to grow paddy and pearl millets in their lands. However the yield was low due to insufficient irrigation. All the four farmers suffered a lot because of lack of water and due to the meager income they could earn from these lands. This was one of the open well considered for rejuvenation and the works started in April, 2012. It took seven days with men and machines to excavate 280 cubic meter of silt from the well. Immediately after 3 or 4 days after completing the work, the water level sprang up to four meters. The farmers were very much delighted. Chandranarayana said "I am seeing the well with good water level after long long years. I am happy that all four of us can cultivate the entire land, thanks to the effort of DHAN Foundation" Now the farmers have sown 5.5 acres of pearl millet in the last week of June and another half an acre with turmeric. They now have no worries about the irrigating their crops and are expecting good yield and returns from their agricultural land. □

Development News

The 2013 edition of World Development Indicators (WDI) was released in April 2013 which includes the latest available data on global development, poverty, the quality of people's lives, the environment, the economy, the functioning of states and markets, and global links of finance, trade, and migration. New estimates of extreme poverty show there were 1.2 billion people still living on less than $1.25 a day in 2010, a decrease of 100 million since 2008. The global rate of extreme poverty fell to 20.6 percent, less than half the 1990 rate of 43.1 percent. Thus the world as a whole has met the first Millennium Development Goal. But many individual countries have made slower progress and may fall short of the target. Progress toward other Millennium Development Goals is documented in a special 17 page introduction to the WDI. This year's edition has been substantially improved, with expanded highlights based on trends in key indicators, including those used to monitor progress towards the Millennium Development Goals. Key indicators are shown in new selected tables, with the full set of tables now available on-line. Enhanced multilingual data access applications for the web, tablets, and mobile devices make the data easier to access. Also released today is the 2013 edition of the Little Data Book with key indicators for each economy in a pocket-sized reference.

The WDI provides relevant and high-quality data on a wide range of development issues, including the most recent global and regional estimates on poverty. This year's WDI includes data that show:

Girls have made substantial gains in school enrollment, although the average rates mask large differences across countries. In 1990, girls' primary school enrollment rate in developing countries was only 86 percent of boys'. By 2011 it was 97 percent. Similar improvements have been made in secondary schooling, where girls' enrollments have risen from 78 percent of boys' to 96 percent over the same period. However at the end of 2011, only nine low-income countries had reached or exceeded equal enrollment of girls in primary and secondary education. 5 million fewer children died before their fifth birthday in 2011 compared to 1990. In low and middle-income countries the under-five mortality rate fell from an average of 95 per 1,000 live births in 1990 to 56 in 2011. 41 countries are poised to reach the Millennium Development Goal target of a two-thirds reduction in under-five mortality rates by 2015, and faster improvements over the last decade suggest that many countries are accelerating progress and another 25 could reach the target as soon as 2020. The economies of many developing countries continued to grow faster on average than the high-income economies of Europe, Asia, and North America. In Purchasing Power Parity (PPP) terms, India became the third largest economy in the world in 2011, behind the United States and China, and pushing Japan to the fourth spot. The other economies making up the top ten were unchanged: Germany, the Russian Federation, France, the United Kingdom, Brazil, and Italy.

Source: World Bank press release-18.04.2013

Youth and Development

V. Venkatesan*

Working with youth – need of the hour

Working for / with youth is need of the hour to regulate the energy and motivation of young souls in right direction for self & state development. India is largest country in the world with highest number of youth population. As per 2001 census, 41% of total population belongs to youth category (13 to 35 years). And out of total youth 2/3rd are living in rural areas. For ensuring sustainable development & national building the contribution of youth are inevitable. But, in current situation youth are facing multiple issues such as

- No or lack of guidance on career / life planning. This dilutes the energy of youth and builds dilemma on their future. Also it mis-directs the youth force in to negative and useless purposes.
- Right kind of counseling in the adolescent ages on health & hygiene aspects are essential to build health seeking behavior among youth.
- There exists a great gap among the opportunities available for urban youth & rural youth. Rural and tribal youth are more vulnerable in economic society, exclusion in mainstream systems is observed to rural youth community.
- Addressing youth issues in right attitude will serve great impact to human kind.

"Youth" as a theme in DHAN Foundation

The theme on 'Youth and development' was launched in DHAN Foundation on October 02, 2010. The theme focuses on bringing youth in the development arena and shaping them as more vibrant and productive force of the society. Poverty reduction will spell better way when the right choice of career life and livelihood is made available to each youth in the early stages. It has direct relevance to DHAN's mission of poverty reduction.

By enabling the life skills and functional education to youth in the early life stages will help them to be self-reliant and also it will provide space to consolidate the

energy for common cause. Since youth is seen as the vibrant section of the society, the theme aims at building them with necessary health, education and employment opportunities to uplift their lifestyle.

The new theme on youth and Development aims at building the youth group with skill and value education in order to make them as a vibrant social capital in the society. The characteristic factors of youth group are as follow,

- Youth is a stage wherein full-time education gets over.
- Living /leaving parental home and establishing new living arrangements.
- Set of personal relationship and responsibilities are generated as part of matrimonial part.
- It is a stage wherein settlement in a career happens and livelihood gets established.
- It is critical stage which has more susceptibility toward external environment.

The age group of the youth is getting defined in various terms by various institutions at global level. Similarly, different age groups of the youth have different set of requirements in relation to their life stage and lifestyle. The expectations from the youth are always at higher order for education and employment. The youth group declaration by various forums and the requirements of different age group are as follows,

***Mr.V. Venkatesan,** Anchor, Youth and Development Theme

Age group as youth	Declared by
15-24 years	United Nations General Assembly
15-24 years	World Bank
15-29 years	Commonwealth Youth Programme
15-34 years	World Health Organisation
16-30 years	National Youth Policy (2012) of India.

Youth Age group	Requirements
16 – 20 years	Youth who requires educational services
20 – 25 years	Youth who requires access to employable skill
25 – 30 years	Youth who requires career stabilisation/requires access to self employment and entrepreneurial skills

Youth action in existing programmes of DHAN Foundation:

1. Among the members covered through the thematic institutions of DHAN Collecitve namely Kalanjiam foundation & Vayalagam foundation an amount of 50% of total members are in youth category which covers around 2.5 lakhs of youth. In addition to that, around 10% youth are occupying leadership space at community level which covers around 25,000 youth.
2. The themes on Working with Panchayats & ICT are providing direct thrust to building and organizing youth for community development. The experiences from these themes are getting incorporated
3. The subsidiary institutions of DHAN Collective namely Tata–Dhan Academy, Dhan People Academy, LIFE (Livelihood Initiatives for Functional Education) centre & CHRD (Centre for Human Resource Development) are almost 100% working for youth. The primary purposes of these institutions are "grooming youth with social concern and build attitude, skill & knowledge of youth for development action with grassroots'.
4. The present manpower of DHAN Foundation is around 750. However, the average age of DHAN Foundation is around 30. Hence, DHAN as an institution itself is "youth" institution.

The theme is initiated with a view to integrate the youth section with the existing programmes of the institution. The theme would operate both as a standalone and cross cutting one within the existing programmes.

Update on Youth and Development

As part of piloting, the Alanganallur block of Madurai district is chosen for experimentation of various activities of the new theme. In addition, few villages belong to T.Kallupatti block of Madurai district is also chosen wherein youth and agriculture is more prominent. The highlights of the progress are as follows,

- Focus group discussion with the youth group was happened in A.Pudupatti village of Alanganallur block, Madurai with a focus on milestone for youth. Around sixty members have participated in the event; of them around 75% are belongs to youth category. The highlights are given below,
  - ⇨ The village has prominence in developing youth through village level association
  - ⇨ Good players have emerged from the village
  - ⇨ Youth are sensitive and more supportive during emergencies such as fire accident. The elders feel very happy about their support
  - ⇨ Youth in farming declining day by day
  - ⇨ The students are in need of education counseling and encouragement for sports activities. They expect their parents to be more supportive for participation in sports.

- ⇨ De-addiction programme for youth is needed immediately
- ⇨ Youth festival is needed to enhance their motivation level

As part of follow up six volunteers are identified for further development of theme in the village.

- An attempt on creating baseline for the Kilankulam village was done with the support of B.Tech (Horticulture) students as part of their rural agricultural work experience programme. The base line was focusing on enumeration of youth section in relation to education and employment. The refinement of baseline is in progress. In addition three case studies on "Youth in Agriculture" were done with three families wherein youth are prominently looking after agriculture.
- The first advisory council meeting of the theme was held on at RGNIYD (Rajiv Gandhi National Youth Development) was held on September 28, 2012. The agenda such as evolution of theme, constituting advisory council, and plan for experimentation was discussed. It was decided that the Director of RGNIYD will be the chair of advisory council.
- MoU (Memorandum of Understanding) with RGNIYD was executed on September 28, 2012 at RGNIYD. The purpose of the MoU was to have mainly for joint action in designing and coordinating youth development programmes for the youth spread across various states of the country and also to facilitate mutual sharing of resources, academic and field based knowledge between RGNIYD and DHAN Foundation eventually to provide a real life exposure and experience for the youth. □

DHAN in Media

THE TIMES OF INDIA

17-02-2013

'Panchayat's role crucial fo success of govt schemes'

TIMES NEWS NETWORK

Madurai: Any government scheme will succeed if implemented efficiently by panchayats, said Naresh Gupta, former chief electoral officer of the state after conferring the diplomas of panchayat management programme offered by DHAN People Academy to 413 candidates here on Saturday.

Delivering his convocation address, Gupta said that panchayats play a crucial role in the administration as the six lakh villages in the country have more than 80 crore people, as per the 2011 census.

Rural development should be given sufficient thrust, he stated, as many schemes of both the centre and the states

THE HINDU

17-03-2013

DTP course for slum dwellers

ivelihood
for Functional
nd Tami Nadu
ce Board will
course,
ves, for

Indian Express

17-04-2013

A Flick to Give Millets a Push

Express News Service

Madurai: When people,

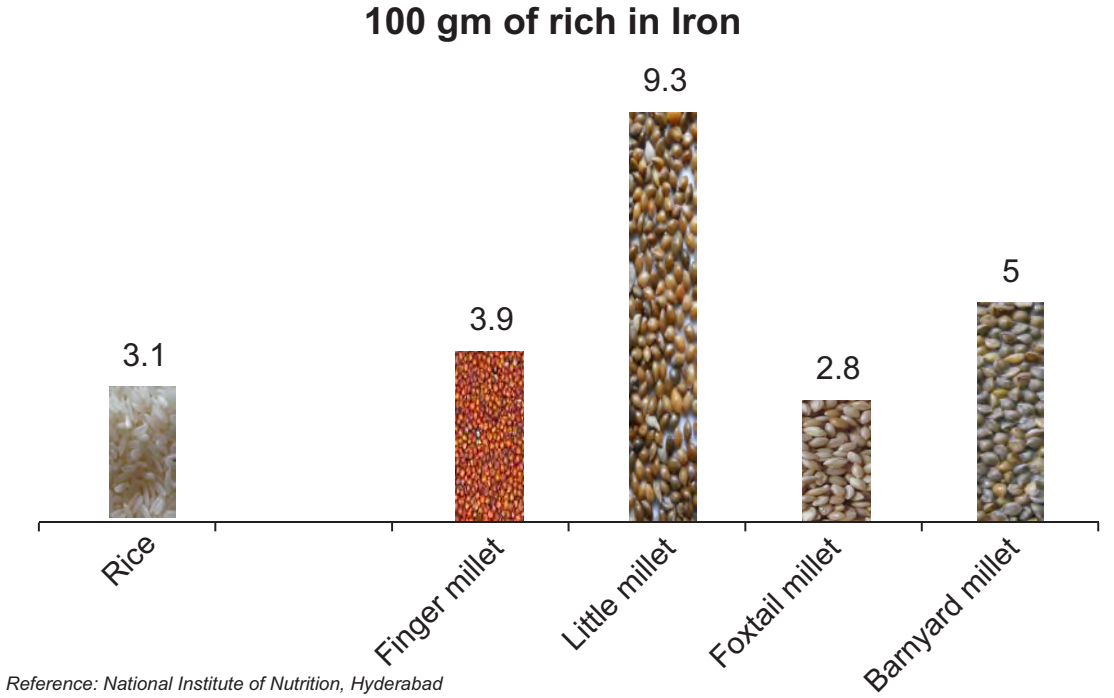
their project under the guidance of filmmaker Veerabhadran of DHAN Foundation, has been in the making since last April. The movie opens in Sengapadai village at Thirumangalam, where the cultivation and usage of millets are high. A villager explains how the

Rich in Iron

Hemoglobin in red blood corpuscles is responsible for transport of oxygen to all the bodily parts and tisues and responsible for the red colour of the blood. Iron content in our daily dietary intake will ensure formation fo hemoglobin in sufficient quantities in blood, the lack of which may produce anemic condition in the body. Anemia is a disorder which is prevalent especially among women, pregnant women, lactating mother,adolescent girls and children. More than 50 percent of Indian population are anemic.

Anemia will affect the learning ability of children, cause youth to perform well below their level as improper supply of oxygen will affect the functioning of brain and active functioning of the body

Including Small millets rich in iron can help a lot to prevent occurrence of anemia



Reference: National Institute of Nutrition, Hyderabad

Food and Nutrition Security for Women

Women are highly vulnerable to malnutrition, for social and biological reasons, throughout their life-cycle. Given the long hours of working and shouldering multiple roles in poverty situation, they are at risk of under-nutrition. Adolescent girls and pregnant mothers are at high risk of malnutrition, facing chronic energy deficiency, disorders attributed to iron and iodine deficiency, compromising the deposition of critical bone mass due to low calcium intakes. Women centred nutrition and reproductive health programmes are critical for breaking the cycle of malnutrition.

After a decade of intensive field experiments, Kalanjiam Reproductive and Child Health programme has evolved and accepted as a replicable model for caring the adolescent and maternal health. It has benefited over 383,000 women and adolescent girls so far.

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