February 2013

Development Matters

Monthly Development update from DHAN Collective

Feature

Small Millets Inspire
thousands to walk for a cause

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Monthly Development update from DHAN Collective
Vol. VII Issue 2 February 2013

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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Small Millets Inspire Thousands to Walk for a Cause

M.Karthikeyan*

An opportunity

Small millets, a sub-set of millet crops, include six crops namely Finger millet (Kezhvaragu), Little millet (Samai), Kodo millet (Varagu), Foxtail millet (Thinai), Barnyard millet (Kudiraivali), and Proso millet (Panivaragu). While there are many research studies that inform the nutritional superiority of small millets, there has been a drastic decline in production and consumption over the last few decades. The cultivated area in India declined by 46% for finger millet and 80% for small millets other than finger millet from 1966 to 2009. Consumption declined by 45% for finger millet from 1987-88 to 1993-94. On the other side, India is reeling under multiple large scale malnutrition issues like anaemia and underweight among women and children and Prime Minister called these issues as 'a national shame'. These malnutrition problems are spread across rural and urban areas and across all the economic classes. There is an opportunity to address these malnutrition concerns by facilitating inclusion of small millets in mainstream diets. Inclusion of small millets by the common public will also create a favourable environment for production through increased demand. But for this to be realised large scale promotion of small millets is needed.

In terms of awareness and consumption of small millets, the common public can be divided into three categories: First category includes people who perceive that small

millets are nutritious but do not consume; the second category meagre in number includes people who are advised by doctors to consume small millet recipes as a diet component for their health problems and the third category includes urban people who have not heard about small millets. Social image and reluctance to change the food habits are some of the main reasons for not consuming small millets even if the nutrition benefits are known. Further among small millets, only finger millet is known widely and other small millets are known only in the cultivation regions. So large scale promotion efforts aimed at introducing small millets and changing their image among the common public is very much needed. Many of the earlier efforts have been limited in scale and sometimes elitist in approach. There are efforts to include millets to include in public food systems without taking efforts to change the current image of small millets among the public.

Walkathon focusing on small millets

Walkathon is an annual feature of DHAN Foundation. For every two years one socially relevant theme is chosen and Walkathon is organised around that theme. The event reaches out to thousands of people every year across a wide geographical area by involving them in "Walk for a Cause". DHAN has organised Walkathon

***Mr.M.Karthikeyan,** Programme Leader, Rainfed Farming Development Programme

on February 2, 2013 on the theme of 'Agricultural Biodiversity and Food Security', with a focus on small millets, with the aim of taking the message to few hundred thousands of public on the links between agricultural biodiversity and food security and on how promoting small millets consumption can address the twin goals of improving agricultural biodiversity and food security. The target group aimed was common public, with a special focus on students.

DHAN Foundation has organised a month long campaign to promote small millets ahead of Walkathon, through various events like recipe contest, orientation to school and college students, essay writing, drawing, quiz and elocution contests to the students on topics relevant to the theme of food security. The winners of these contests were appreciated on the day of Walkathon. A film festival was also organised as part of this event. Walkathon was organised in 26 places across the states of Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Odisha.

The event involved rally of school students and farmers in the district head quarters followed by exhibition and seminar on the theme. Over 200,000 people including farmers, women and school students participated. Various stakeholders like National Biodiversity Authority, Agriculture department, Animal Husbandry department, Agricultural universities and KVKs participated in the event. Various public and private organisations supported the event by offering various types of sponsorship. Many promotional materials like booklets, pamphlets, posters, etc. were prepared in regional languages and distributed to large number of public.

Differently abled persons- Walkathon?

Building on RESMISA project:

The 2013 Walkathon derived inspiration from and was building on the action research project by name, 'Revalorising Small Millets in Rainfed Regions of South Asia (RESMISA)', anchored by DHAN Foundation in India. This project funded by Canadian International Food Security Research Fund (CIFSRF) of IDRC and CIDA, aims to increase production and consumption of nutritious small millets and associated pulse and oil seed crops in rainfed regions of India, Nepal and Sri Lanka. The findings and insights from the project for the two years, especially on the nutritional features of small millets, products developed and promotional materials prepared like recipe booklets were extensively used in the Walkathon event across the states. This in turn resulted in preparation of booklets, recipe folders and posters on the theme of promotion of small millets in regional languages.

DHAN has prepared a booklet on agricultural biodiversity and small millets which covered the historic legacy of small millets, references in Sangam Tamil literature, link between agricultural biodiversity and food pattern, health benefits of small millets over rice

and wheat, present status of production and roles and responsibilities of various stakeholders in promotion.

Cherishing legacy of small millets

A booklet in Tamil titled "Palluyir Ombuvom (Let's Protect Bio-Diversity – Relevance of Small Millets in Ensuring Food and Nutrition Security)" was published to educate the public. The booklet with illustrations describes the historic legacy of small millets, references in Sangam Tamil literature, link between agricultural biodiversity and food pattern of a region, role of small millets in Tamil cultural events, health benefits of small millets over rice and wheat, present status of production and roles and responsibilities of various stakeholders in promotion.

Recollecting the legacy of small millets, Ramasamy, a farmer from Tamil Nadu said "Today we are facing indebtedness mainly due to heavy borrowings for irrigated farming. Whereas the small millets can be raised without much expenses and can survive even with limited rainfall. Varagu (Kodo millet), which was our staple food earlier has become a prescribed food for sugar patients today. Those days we ate Varagu rice and worked for long hours in the field without fatigue. Today we are affected by many ailments and we have to run to hospitals all the time. We need to revive small millets in our foods"

Reviving heritage of food

The Walkathon event made an effort to raise peoples' consciousness on the need for preserving traditional knowledge about medicinal and nutritional value of food, and the need to pass on that knowledge to the young generations. Given the diversity in soil type, climate and farming, food heritage of the communities in India varies significantly and influenced heavily by their religious and cultural choices. It was proved through variety of recipes brought by the participants in the recipe contests organised as part of this promotional campaign in all the places. Hundreds of people took part in the contests and displayed their culinary talents. One of those contestants presented a maximum of 40 delicious and mouth-watering recipes made out of small millets. Food festivals also helped the participants to taste a variety of recipes made of small millets. Recipe booklets and folders were distributed to the participants to help them try out small millet recipes in their homes. Tips and easy ways of introducing small millets in the daily menu were shared to the public.

Films to promote public engagement

Development Film Festival, another yearly feature of DHAN Foundation, was conducted along with Walkathon and its theme was Food Security and Climate Change. There was an overwhelming response from short feature and documentary filmmakers. A three-day Festival organised at Madurai, Tamil Nadu showcased films from different parts of the country, wherein a large number of younger viewers took part and debated on the food security and climate change issues portrayed in the films. Best films were awarded at the closing ceremony of Walkathon.

Involving media

The Walkathon event had a very clear media strategy for engaging both print and electronic media to build awareness and create public opinion on small millets across all the places. Through conferences, briefs and field visits, the Walkathon event created opportunities for the journalists to feature stories on the importance of reviving small millets in daily diet. They published stories and voices of the people advocating small millets. Media coverage details and photographs of Walkathon can be viewed at http://www.dhan.org/maduraiwalkathon/

Impact so far

The primary impact is that large number of public in the non-cultivating regions came to know that crops such as kodo millet (Varagu), barnyard millet (Kudiraivali), and proso millet (Panivaragu) exist and small millets are superior to commonly consumed cereals. In the cultivating regions the event has raised lot of nostalgia among the public as they used to consume these crops a decade back. There has been lot of enquiries about the source of seeds and ready to cook products of small millet crops in many of the Walkathon sites. As one of the main constituents of the public involved were members of various programmes of DHAN Foundation, action plans for further campaigns and recipe trainings, for introducing small millet crops by facilitating seed supply and for introducing consumption by facilitating linkages for sustained supply of ready to cook products like rice and grits were made and is being put into action. Further Walkathon helped in forging linkages with relevant stakeholders.

The Walkathon event was found to be an apt activity to raise awareness on a large scale to enhance the consumption and to change the social status of small millets among the public. As DHAN Foundation has the institutional practice of organising Walkathon on the same theme for two years, next year also similar efforts will continue. It is planned to host in the coming year a number of promotional activities such as TV programs, films, newspaper columns, and information sessions for journalists, and to disseminate promotional material highlighting cultural, nutritional, environmental and other qualities of small millets. The campaign will also reach out to more number of schools and colleges. Educational materials prepared as part of RESMISA project would be disseminated widely. □

Field Notes - Climate Change

Forced to beg for water

Now it is not raining properly. Purchasing water from those who have open bore wells has become unprofitable. Even if I try to purchase, now they are not ready to give water due to prevailing electricity problem. My heart weeps on seeing the dying crops. So I decided to construct a farm pond. I no more wish to beg water from others.

- Ilangovon, 47 years, *Kilangulam*

Two sides of a coin

If rainfall continues to deceive us like this, we will be forced to quit agriculture. All the agricultural lands will get converted into commercial plots. People have to eat mud instead of rice.

- Fathima w/o Ragupaandi, 40 years, *Chokkampatti*

The youth feel

I feel that backyard poultry rearing can be an option for this village, which can ensure some income even if rainfall fails. For youth like me life skill training like Sewing, embroidery, mushroom cultivation etc., can be of much use.

- Murugeswari, 24 years, *K.Chattirapatti*

Indigenous Agricultural Implements

V.Vediappan & S.Ramesh*

Identifying the exact origin of agriculture remains problematic because the transition from hunter-gatherer societies began thousands of years before the invention of writing. However, historians agree that the Indian agriculture began by 9500 BCE when men started domesticating crops and animals. Settled life soon followed with implements and techniques being developed for agriculture. A broken twig from a tree is the first known agricultural implement ever used by a man.

Ever since man started cultivating crops on his own, he started devising his own simple tools to make the tillage operations easy. The simplest tillage implement the wooden plough itself has undergone many changes in its design since its inception. As goes the saying "Necessity is the mother of all invention" farmers across the world keep innovating new implements based on their local needs. The farmers in Anjetti, Denganikottai taluk of Krishnagiri district, Tamilnadu is one such folk who have invented or borrowed knowledge of many simple implements to meet their rainfed farming needs. These farmers have adapted some of the practices from neighboring Karnataka state.

The major rainfed crops grown at present are ragi and groundnut. Intercrops like red gram, field bean, etc., also were grown along with them. Ranging from ploughing and land preparation to thrashing of grains after harvest these implements reduce their drudgery, saves time, labour and money. India is a country were the farm holdings are highly fragmented. Most of the small and marginal farmers cannot afford to use the modern agricultural machineries which incur high cost. However the growing labour demand and also to improve the efficiency of farming operations Anjetti farmers make their own simple implements out of locally available materials. The cost of these implements ranges between ₹ 300 to ₹ 4,000 only.

Ploughing Implements

Wooden Plough

Indigenous wooden plough used in Anjetti consists of body, shaft pole, share and handle. Except for the share all the other parts are completely made of wood. It is drawn with bullocks. Wooden plough is in use Anjetti traditionally, as ploughing with wooden plough increases the water holding capacity of the soil and also helps in quick absorption of nutrients from manure applied. Nowadays it is mainly used for sowing intercrops in broadcasted finger millet or in groundnut field along with another implement called Jattai. It cost just ₹ 1,000/ to make a wooden plough

Usage

1. For ploughing
2. Inter crop sowing

Iron Plough

Iron plough used in Anjetti is a simplified version of moldboard plough and is in use for the past three decades. Except for the shaft pole, the entire plough is made of iron. It has a longer life than wooden plough

***Mr.V.Vediappan,** Senior Project Executive & **Mr.S.Ramesh**, Team Leader, DHAN Foundation

and can be retained for 15-20 years. Ploughing is quicker using iron plough than wooden plough (1 acre of land can be ploughed in an hour using iron plough, whereas only 0.75 acres can be covered using wooden plough) and weeds get buried and decomposed easily.

Iron plough is getting increasingly used for ploughing operations than wooden plough. It costs ₹ 3,000/- to make an Iron plough. The wooden plough is not durable in long run and needs constant repair and maintenance. The iron plough can be used for 15 to 20 years with less maintenance cost. However Iron plough is not without demerits. Ploughing using Iron plough will make the land shallow in the middle and hence requires frequent leveling. Moreover Farm yard manure applied will not be available for the immediate crop but for the next crop. The moisture retention capacity of the soil will also be lesser than ploughing with wooden plough.

Usage

1. Mainly for ploughing
2. Groundnut seed sowing
3. Weeds gets buried in the land and decomposed
4. Quick and coverage of the area will be more when compare to country plough

Leveling implements

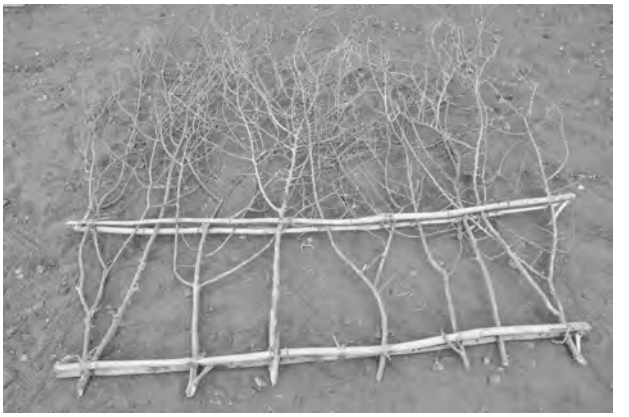
Pallukai

Pallukai is a bullock drawn leveling implement. Used by the farmers of Anjetti from the time immemorial. The body, tines, handles and shaft pole of Pallukai is completely made of wood and weighs around 30 kg. Commonly used Pallukai's have either eight or 10 tines with a spacing of 10 cm between them. Fixed in a 90 to 120 cm wooden body with an optimum thickness to hold the tines. The length of the tines varies from 35 to 40 cm. Pallukai is used in broadcasted finger millet field immediately after sowing to enable the seed to get optimum depth for germination. Pallukai is also used before the seed drill for pulverizing the land and leveling, which facilitates easy sowing using seed drill. Pallukai hence loosens the soil, increase the depth of sowing if seeds are broadcasted and also levels the land. The cost of the one pallukkai is ₹ 1,400/-

Usage

1. Loosening the soil before seed drill is running
2. Used in broad casted field for seed sowing
3. Some time thinning in broadcasted finger millet in rare cases

Thadukkai Otthudhal



Thadukkai is a very simple implement which can be prepared in a quick time with bamboo and locally available weeds like Lantana camera. The stems of lantana camera or any other thorny weeds is fixed in two rows of a bamboo frame. The approximate dimension usually will be of 150 cm breath and 180 cm length. Thaddukai otthudhal is the operation which ensures perfect leveling of the land and also closer of broadcasted seeds with soil to facilitate easy germination. This operation also makes the soil texture loose and increase the water holding capacity of the soil.

Usually to give it more weight to facilitate leveling, stems of fresh leaves are loaded above the main frame. Thadukkai is also used without this weight after thinning of ragi crop using another implement called kuttai thindu for removing the thinned ragi crops and also other weeds from the field. This operation also straightens up the ragi seedlings that has lodged during the thinning operation. Since thadukkai is weighs only 10 kg or less it can be

dragged easily manually or at times it is bullock drawn. It is no cost tool which just require locally available plants and labour for making

Usage

1. Thadukkai otthuthal for leveling and closing of seeds in broad casting and seed drill method of sowing
2. Soil will become loose it observe more moisture

Thimmi

Sandy soils are often very loose and do not support germination. Traditionally the people of Anjetti used to run goats and sheeps over such soil to tighten the loose soil and facilitate germination of seeds. Deriving the knowledge from this operation, farmers of Anjetti devised Thimmi. Thimmi is made of two long wooden spindles in which goat/sheep foot like structure is carved. Rolling Thimmi over the land not only tightens the soil, but also kills the root grubs which damages the finger millet seedlings while germination. However nowadays, its usage is limited because of high operational expenditure.

Usage

1. Tighten the loose soil for better germination
2. Avoiding of root eating larva

Sowing implements

Seed drill

Bullock drawn seed drill is widely used by the farmers of Anjetti for sowing finger millet, the technology being adapted from Karnataka. A seed drill is a sowing device that precisely positions seeds in the soil and then covers them. The commonly used seed drill has a hopper connected with four to six iron or plastic pipes, which in turn are attached to a main wooden body. The wooden body has four to six bamboo stick with holes through which seeds gets placed in the soil at 20 cm distance. At both ends of the wooden body bamboo sticks without holes is fixed which supports to adjust the depth of sowing. Seed drill ensures line sowing, to maintain optimum plant population, facilitates other intercultural operations like thinning, weeding and earthling up operations. All this helps the farmer to save labor, time and money apart from increased productivity. Seed drill can be made locally by incurring a expense of ₹ 3,500/ to 4,000/-

The comparison between broad casting and line sowing

S.No	Particulars	Broad casting	Line sowing
1	Seed requirement	12 kg /acre	6 kg/ acre
2	Labour required	3 labour /acre	5 labour /acre
3	Implements used at the time of sowing	Iron plough, pallukkai and jattai and thatukkai	Pallukkai, seed drill, jattai and thatukkai used
4	Area cover per day	4 acre	4 acre
5	Thinning and weeding	By hand 10 to 12 women labour is required to complete the operation one day	Done using 6 chipi thindu twice criss crossing the field. 2 chipi thindu is used for earthling up. Saves labour and time
6	Yield	5 quintal /acre	8 quintal per acre
7	Drought	Susceptible for drought because seeds are at different depth. Moisture stress will affect the growth	Tolerant to drought because seeds are in uniform depth (2 to2.5 inch depth) so with stand even drought.
8	Rain during harvest	Lodging happens even with less rain fall and wind during harvest	Lodging is not happened except very heavy rain fall

Usage

1. Line sowing
2. Optimum plant population will be ensured
3. Productivity will increase up to 60 percent
4. Easy to do other intercultural operations using special implements
5. Drought tolerant during drought and lodging tolerant during rain fall in harvest time

Jattai

Jattai is a single line seed drill which was in use even before fifty years in Anjetti and has been widely used before the modern seed drill came to use. Jattai is funnel like hopper at the top attached to a tubular bamboo pole. For sowing intercrops like red gram, field bean, caster, cowpea, sorghum and niger in finger millet field or for sowing intercrops in groundnut fields, Jattai is tied two feet behind the wooden plough. While the wooden plough makes a furrow while ploughing, intercrop is sown in the furrows using this jattai and the seed get closed by a wooden plank attached to jattai with a rope which gets dragged along the soil. So in a single operation both ploughing and sowing operations gets completed.

Usage

1. Sowing of intercrops in both the method of finger millet
2. Sowing of intercrops in groundnut crop

Weeding Implements

Ekkuttai

Ekkunttai is a weeding implement and is in use in Anjetti for more than four decades. The body, handle and the shaft pole of Ekkunttai are made up of wood and while the tines are made up of iron. Usually four or six tines of 50 cm length are fixed in the wooden body with spacing of 10 cm between them. It is used for removing deep weeds from soil during first ploughing and also for first weeding in groundnut crop. If 10 women labors are needed to weed one acre of land normally, if this weeder is used only four women labors are sufficient thereby reducing the weeding cost very much.

Usage

1. Removing deep weeds from the soil while first ploughing
2. Used as a weeder in groundnut for first weeding operation(using iron rod as a tines instead of wooden tine) if we use thick iron chip it is not useful for groundnut first weeding

Blade Harrow or Vaal Ekkuttai

Vaal Ekkuttai or Blade harrow is a modified version of Ekkuttai which can be made using body of Ekkuttai and by removing the two tines in the middle. And then a long blade like iron plate is attached at the end of the two tines by welding or with nuts and bolts. Vaal ekkuttai is used if weeds are seen more in the field after ploughing, but before sowing of ragi seeds. After ploughing some weeds may germinate using existing moisture and Vaal ekkuttai is used for removing such young weeds. After weeding with Vaal ekkuttai, Pallukai is also used after which follows the usage of seed drill.

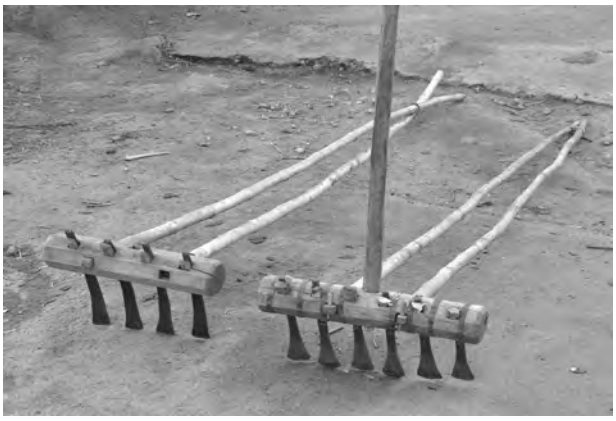
Usage

1. Removing young weeds in plain land before using pallukkai and seed drill

Kutta thindu

Kutta thindu resembles Ekkuttai except that the tines here are very closely spaced and their length is shorter than in ekkuttai. However the tines are much flat at the end. The number of tines ranges from two to six and based on this number their usage also varies. Kuttai thindu with six tines and four tines were used in line sown finger millet after 15 days of sowing.

The implement is used to maintain optimum ragi population in the field by removing the excess seedlings. The implement is run crisscrossing the field which ensures thinning and also weeding. Two acres of land can be thinned and weeded in a day using this kutta thindu



Usage

1. Thinning of finger millet seedlings in line sown crops to maintain optimum plant population
2. At times used in broad casted finger millet field also if the plant population is very thick.

The Kuttai thindu with two tines on other hand is used for earthing up operation in groundnut and finger millet crop one month after sowing. One acre of field can be covered in four hours with only two men laborers. On the other hand to manually weed one acre of groundnut in a day, 15 to 20 women laborers are required and the costs three times more.

Usage

1. For second weeding in between rows
2. Helps in earthing up of soil supporting good plant establishment

Stone Kundu for thrashing

Kundu ottuthal is an age old practice of anchetty for thrashing finger millet with one pair of bullock. While doing this operation finger millet is separated easily from stalk. Per day 100 sumai (bundles) will be thrashed. For separation of straw and finger millet is easy in this practice. Now a days tractor and paddy thrasher also used for thrashing finger millet.

Using tractor and paddy thrasher become quick but cleaning will take more time because of more of dust will be formed during the operation. Anther demerit when compared to stone kundu is the straw does not like by cattle due to leaf of the straw become powder without leaf so cattle is not liking the straw. The stone kundu is made during 3 to 4 generations ago so cost is not known by the farmer.

Usage

- Thrasing finger millets

Indigenous Implements and its usage pattern over years

Sl. No.	Implements	Number of year in use
1	Kundu	> 100
2	Jattai	> 50
3	Ekkundai	> 40
4	Iron plough	30
5	Pallukai is used both broad casting and line sowing	> 60
6	Pall Ekkundai	14
7	Seed drill –line sowing	15
8	Blade harrow for first weeding (only few farmers using this implements)	12
9	Wooden thinner (1 or 2 times)	15
10	Wooden weeder cum earthing (second weeding)	15
11	Thimmi is special implement used for tighten the loose soil for better crop establishments (Presently not in use)	> 50

Eighth Development Film Festival

The Eighth developmental film festival on climate change and Food security was organized from 28th to 30th , 2013 at DHAN Foundation Plaza which had an overwhelming response from the public, media persons, professionals and students engaged in short film making.

The inauguration of the event was done by Dr.(Mrs). Kalyani Mathivaanan, Vice-Chancellor Madurai Kamaraj University, who in her inaugural speech spoke about the climate change and its future impact on food security. She spoke that the effect of climate change on agriculture is more significant since it will directly affect the basic need of our life- the food. Climate change is expected to increase the imbalance in food production and the tropical countries are the one which are going to be most affected. We have no other alternative but to change ourselves and adapt our agricultural practices and food habits in tune with the changing climate. The scarcity of like water and fertile land together with climate change, will pose a serious threat in future even for ensuring right quantity of food to all. She lauded the effort of DHAN for conducting the film festival on a theme that needs much attention in the present scenario.

Dr. SP.Sundaram, Dean-in-charge, Ac & RI, TNAU, Madurai in his special address discussed in detail about the causes of climate change and the agricultural universities efforts in increasing productivity through climate sensitive approaches. Mr A.Gurunathan, CEO,Vayalagam Foundation shared about the role of tanks in combating climate change. Mr.Maha. Somas Kandhamurthi, Station Director, All India Radio, Madurai appreciated the effort on DHAN for organizing film festivals every year on most important development issues. The event was coordinated by Mr.Venketasubramanian, CDC.

There were more than 200 participants each day, most of them being students from different colleges in and around Madurai. The participation of students from Agricultural college and Research Institute, TNAU, Madurai, Vellaisamy Nadar college, American college and Fathima college as spectators added value to the event. The most promising part is the interest of students in making short films with developmental concern, some of whose films were selected for screening.

Development Film Festival- A overview

The Development Film Festival organized by DHAN is stands apart from other film festivals organized in the country in that the theme for the festival every year revolves around a specific developmental issue that has to be addressed for making the society and world a better place to live. It also serves as an creative platform for the film makers with social concern to showcase their works. The Festival organized every year to raise public awareness and to promote the public view, debate and meaningful action around the issues. Seven film festivals were held prior to this which too had a good response. The First edition of the film festival focused on poverty, from a larger perspective on water, environment, gender, education, health and culture. The second festival focused on Water and life. The third edition of the Festival was again focused on 'Water and People'. The fourth edition of the Festival focused on 'Culture and Heritage'. The fifth edition was on 'Fight Poverty: Connect and Commit for MDGs'. The sixth edition of the festival, held in 2010 focused on Democracy and Development. The theme of the seventh edition of the development film festival, was on "Livelihood and Poverty" The filmmakers from all over the world responded overwhelmingly in all these festivals.

Film festival on Climate change and Food security

Climate change is expected to increase the imbalance in food production, the temperature and rainfall variations (onset of monsoon, changes in duration, frequency and quantity of rains) and the tropical countries are the one which are going to be the most affected. In fact

the climate change has already happened. Changes in temperature and water availability will drastically impact food production and food security of the people. The Millennium Development Goal aims to reduce the proportion of people suffering from undernourishment by half by 2015, which indeed is a difficult task considering the present situation of climate change, threat to agricultural productivity and increasing food demands over the years due to increasing population.

Ensuring nutritive food for all, is a challenge in the present circumstances. Food production in tropical countries is expected to be affected more and the resultant food crisis will affect the people in tropical developing countries especially the poor and vulnerable communities.

Considering the issues and challenges in food and nutrition security to the poor and vulnerable communities, the theme for the eighth edition of Development Film Festival is fixed as "Climate change and Food Security"

Selection of the Films for screening

The films for screening were selected by a panel comprising of film makers, development practitioners and academicians. Films were screened to the public of Madurai, including school and college students. The films were subjected to preliminary screening by a panel consisting of a subject matter specialist and two persons with rich experience in editing and photography. Each film are rated for 50 points under the following criteria's

- Relevance of the theme
- Context and treatment
- Presentation
- Technical Quality
- Creativity

Among the Indian films, nine films which scored high marks (average taken) were selected for screening. Three international films, which scored high marks, were selected for special screening

The Screening of Films and awards

Each day three films were screened under award category and one film was screened in the special category. Totally twelve films were screened in three days. The following three films emerged as winners based on the rating of the panel.

1. Title of the Film	**Earth Witness-Reflections of the Time and the Timeless.**
Director	Akansha Joshi/Rajiv Mehotra
Film Maker/ Producer	PSBT
Duration	60 minutes

Four Common People- a teacher, a farmer, a shepherd and a father, find themselves on the front line of earth's biggest and complex crisis: Climate Change and Food Security. Pictured in four different ecosystems- Mountain ecosystem of Nagaland, the Grassland ecosystem in Kutch, the Coastal ecosystem near Ganges and the Forest ecosystem of Central India, the film the live journeys of these four people on climate change and environmental perspective.

2. Title of the Film	**Seeds of Dissent**
Director	Pankaj Rishi Kumar
Producer	PSBT
Duration	50 minutes

The film portrays how agriculture and farmers gets affected due to industrialization, improper credit systems, no appropriate price for the produce etc., The distress of farmers in different states from Kanyakumari in Tamilnadu to Dehradun was captured in the eyes of the people taking up a cycle rally to safeguard farmers and agriculture.

3. Title of the Film	**Cotton of my Shroud**
Director/Producer	Nandhan Saxenna/Kavitha Bhai
Duration	75 minutes

Farmers in Vidharba and other surrounding districts of Maharashtra were forced to commit suicide due to crop failures and lack of appropriate price for cotton. Lured by the marketing techniques of the multinationals the farmers switched over to Bt cotton. The Bt cotton forced farmers to incur more expenditure from seeds to other inputs, forcing them to borrow more. Unable to repay the debts, the farmers were forced to sell their lands and other assets and as an extreme step they commit suicide.

□

Climate Change Adaptation Theme

R.Adhinarayanan *

Climate Change adaptation: why?

The fourth report of Intergovernmental Panel on Climate Change (IPCC) has drawn the attention of the world towards the climate change concerns and challenges. It has projected that the mean temperature of the globe may show an increase between 1.4 degree Celsius and 5.8 degree Celsius by 2100. "This unprecedented increase is expected to have severe impacts on the global hydrological system, ecosystems, sea level, crop production and related processes. The impact would be particularly severe in the tropical areas, which mainly consist of developing countries, including India" says Jayant Sathaye, P. R. Shukla and N. H. Ravindranath (2006).

Further they state "Developing countries are faced with immediate concerns that relate to forest and land degradation, freshwater shortage, food security and air and water pollution. Climate change will exacerbate the impacts of deforestation and other economic pressures, leading to further water shortages, land degradation and desertification. Increasing global temperatures will result in rising sea levels. Populations that inhabit small islands and/or low-lying coastal areas are at particular risk of severe social and economic disruptions from sea-level rise and storm surges that could destroy cities and disrupt large coastal livelihoods".

The projected impact of climate change could not be prevented in a short period of time hence the damage created on atmosphere is very large extent. So there is a need for adaptation by human beings and other living organisms to the changing climate to survive without struggling too much.

Further, Jayant Sathaye, P. R. Shukla and N. H. Ravindranath (2006) have discussed that the most effective way to address climate change is to adopt a sustainable development pathway by shifting to environmentally sustainable technologies and promotion of energy efficiency, renewable energy, forest conservation, reforestation, water conservation, etc. Also, today there exist increasing concerns on

reducing the vulnerability of the people, their natural resources and their socio-economic system to this projected climate change. We do keep hearing a lot about the mitigation and adaptive strategies for addressing climate change issues being extensively discussed and experimented worldwide.

Though the issue of climate change is global, it also requires local action by means of developing an understanding on climate change at micro level, promoting mitigation and adaptive strategies.

Relevance for DHAN Foundation

As the challenges posed by climate change are many, we need to ensure that the development initiatives / programmes helps in reducing the vulnerability of the people to the negative impacts of climate change and in increasing their coping and adaptive strategies to withstand any future threats. DHAN Foundation, being a development organization working on poverty reduction cannot negate the issue of climate change as it has serious implication on poverty and vulnerability.

DHAN has many thematic programmes to address poverty reduction through activities like conservation and creation of water bodies, afforestation, Coastal Conservation and DRR. Our main focus on the above themes is promoting livelihood and sustaining the activities to reduce poverty. DHAN has experience in environment friendly approach, mitigation and coping with strategies on natural resource management to sustain the resources.

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Climate Change adaptation as a new theme will have lot of opportunities to deepen and strengthen our efforts in all existing programmes. Also the proposed theme of Climate Change Adaptation will give scope to address many climate change concerns and challenges, and poverty reduction. Moreover as DHAN works in various contexts like tribal (Forest) Rural (Agriculture & Water), Urban (Green house gas emission) and Coastal (Marine), there exists a compulsory need and scope to work.

Climate change affects all type development process especially in developing countries. DHAN Foundation has high relevance to adapt climate Change to sustain the development issues in different geo-hydrological contexts. New theme on Climate Change Adaptation emerged in this background.

Climate Change and Disaster Risk Reduction (DRR)

Our recent works on DRR also helps to understand climate change aspects and its effect on the people in terms of increased no. of weather related disasters and increased vulnerability of the people. Also, it reinforces the need to understand the connectivity of the themes of DRR and climate change adaptation. The linkage reveals that the strategies proposed for DRR and the climate change adaptation has the potential to complement each other. This again gives a lead to think of the interfacing scope between these two themes within the institution.

Effects of Climate Change on existing Programmes in DHAN collective

The climate change under the Tankfed agriculture context will pose a threat to the village ecosystem. The threat to village ecosystem will be caused mainly because of the siltation and dysfunctional tanks which creates havoc on the standing crops which further affects the livelihoods of both the farmers and landless farming community. This will lead to push migration to urban areas which in turn will hamper the farming ecosystem. Thus it leads to loss of productivity, fertility and bio-diversity.

The effect of Climate change will be in the form of uneven distribution of rainfall leading to crop failure. The distribution varies as

- Late onset of southwest monsoon & early withdrawal of North east monsoon
- Frequent long dry spell during cropping season
- No change in quantum of rainfall but change in no. of rainy days (decreased rainy days)
- Increase in summer rainfall

The variations in the precipitation had led to the extinct of few cropping pattern in local areas. Eg: Groundnut in Thirumangalam and Kallupatti blocks of Madurai district.

The climate change intensifies the natural disaster (flood and cyclone) frequency which inturn affects the development process. The other effects experienced are

- Sea water intrusion and submergence of agriculture lands by backwaters is increasing and it affects the ground water and crop production.
- Sea level rise in terms of reduced sea shore area as felt by the community.

Extreme temperatures in both summer (maximum) and winter (minimum) causes new health problems / new illness

Poor are affected more

Though we could see the effect of climate change on agriculture, coastal livelihoods health etc, the overall effect will be more on the poor because of their increased vulnerability and this will further accelerates the poverty and affects the development process.

Climate Change issues and Concerns in Programme

- Endemic Poverty as the climate change affects the livelihood and increases migration.
- Limited access to capital, particularly the financial resources.
- Degradation of ecosystem as the traditional structures collapses and natural bird sanctuaries are disturbed.
- Disasters and conflicts like droughts & floods and also the scarcity of water resources leading to conflicts.
- Productive lands will turn into fallow and will affect the agriculture production challenging the food security of the country.
- Occupational change from agriculture will intensify the issue further. Transfer of agriculture knowledge

and practice to younger generation will cease and will cause irreparable loss to agriculture sector.

- Weather related risks are the predominant risks faced by the rainfed farmers. It reduces the reliability of rainfed farming system and diversification, sometimes leading to the neglecting of rainfed farming itself.
- Coastal agriculture being affected due to sea water intrusion
- Fish production declines due to climate change effects which in turn affects the coastal livelihoods (change in sea water temeperature results in extinct of certain species)
- Threat for migration of coastal community in future
- Increased challenge to insurance companies and institutions that are providing social security.
- Claim vs. Premium due to frequent and large scale crop loss and frequent and large scale life and health risks.

New Theme on CCA: Scope

Many of the activities of our existing programmes (KCBP, TADP, CALL, and RFDP) will qualify as activities for addressing Climate change issues. Climate Change Mitigation and Adaptation interventions and development interventions need to complement and supplement each other.

The interventions that are fortifying current coping capacity also have the power to strengthen long-term adaptive capacity. The New theme on CCA will help to understand the issues related to climate change faced by the community, their coping measures and gaps at the location and regional level. Scope exists for Climate Change Education to Action at individual and collective levels.

Scope exists for Agriculture and Health front

- High relevance exists for working on the issues of Climate Change and adaptation in the Coastal areas.
- Scope exists on Conservation and preservation of natural ecosystem such as sand dunes, shallow depth ground water, natural shock absorbers such as mangrove, Bio-shields etc.

Proposed Programme Components

The programme components suggested for the new theme of CCA are list as follows. It needs to be short listed by grouping the different components.

- Climate Change Research - documentation of local issues, review of existing activities and action plan could be tried. Pilots could be taken in the different contexts of existing theme and new areas.
- Climate Change Action – Catastrophe fund / cover support to crop insurance/ health insurance programme, Community fund for CCA, Contingency plan, promoting indigenous coping mechanisms
- Energy particularly on promoting renewable energy
- Afforestation – protecting as well as planting new trees
- Agriculture, conservation of bio-diversity and food security - Soil and moisture conservation measures
- Low cost and green technologies under each sector
- Disaster Risk Reduction – risk reduction, EWS, Preparedness, Prevention and Mitigation

Way Forward

The new theme would be piloted in Rural (Mullai, Marutham - Madurai district), Tribal (Kurunji), Coastal (Neithal -Nagapattinam and Ramanathapuram) contexts to understand the Climate Change effects at micro level and impacts for dissemination.

The outcomes of the pilots could be utilised for finalising the components and design of the programme. The new theme has to prepare proposal for implementing the theme as pilot. It is high time that we develop good understanding on the issues of climate change and its effect on poverty.

- Internal Capacity Building
  - ⇨ Avail Capacity building programmes. Staffs working under the theme could be facilitate for structured training programmes organized by others
  - ⇨ They could be facilitated to undergo e-learning programmes which are advantages in terms of cost and time.
- Identify the niche area for the new theme interventions
  - ⇨ More of localized and context specific intervention strategies need to be identified and promoted.

- Eco system based pilots to evolve CCA models and developing tools for upscaling in similar context with necessary adaptations

⇨ Develop a few products which could be promoted through the existing programmes. Eg: Energy interventions, Afforestation etc.,

Updates of Climate Change Adaptation

- CCA theme launched at 14th Foundation Day of DHAN by Mr. Tom Buijtendorp, Senior Manager Strategy, EUREKO, The Netherlands with community leaders
- Workshop on Climate Change Adaptation and thematic deepening of existing themes' (KCBP, DVTF, RFDP and CALL) conducted at central office on March 19, 2011. All the themes presented their actions on Climate Change adaptation and possible areas for deepening in their respective programmes. Community leaders of respective theme shared the need of CCA and got awareness on CCA.
- As part of conference against global warming a workshop on Urbanization and Climate Change: Opportunities and challenges conducted at Tamukkam ground, Madurai – 23rd July, 2011. Participants from Annapakkiam college of Nursing, urban location leaders of Kalanjiam federation and general public from urban area were took part of the event. Lead paper on water and climate change presented by Mr. A.Gurunathan, CEO of DHAN Vayalagam (Tank) Foundation and Mr.N.Chidambaram, Secretary of Madurai green shared the importance of keeping clean environment with trees.
- Climate Change Adaptation theme conducted a workshop on "Climate Change adaptation for sustainable agriculture livelihoods" on 14th September 2011 in Madurai Symposium with the theme of Advancing Development: Towards sustainable Livelihoods. This workshop Chaired by Dr. A. Baskar, Professor and Head, Department of Soil science and Agricultural chemistry, PAJANCOA, Karaikal. Papers presented on Climate Resilient Farming Systems for Livelihood Security of Small and marginal farmers by Dr. RM. Kathiresan, Department of Agronomy, Faculty of Agriculture, Annamalai University and presentation on climate change and agriculture in Southern Tamilnadu by Dr. R. Babu, Department of Agronomy, Agriculture College and Research Institute, TNAU, Madurai. The change in rainfall deficit affects farmers of rainfed area and excess rainfall affects the farmers in coastal area through floods are examples of climate change effect in Tamilnadu came as a conclusion and it needs adaptation in crop cultivation and practices.
- Madurai Marathon 2011 and Madurai Walkathon 2012 conducted in Madurai, Ramanathapuram, Mysore, and Salem on the focus of giving awareness and action for climate change adaptation. Around 40,000 participants took part of this Walkathon and participated in different events. As part of this event competition (Drawing and Essay writing) for school students were conducted in four districts of Tamilnadu.
- CCA theme submitted a proposal for piloting the theme to GIZ and the proposal sanctioned for an amount of ₹39.07 lakhs during October 2011. This project is being implemented in seven hamlets of three Panchayat in T.Kallupatti block of Madurai district. The project period is for two years October 2011- October 2013. As on September 2012, seventeen farm ponds were completed and five acres of plantation activity completed. Vulnerability assessment of the project area completed. Pre systematization process was completed for the project location.

Roof Water Harvesting

J.Kanagavalli*

Introduction

Rainwater harvesting is an ancient technique enjoying a revival in popularity due to the inherent quality of rainwater and interest in reducing consumption of treated water. Archeological evidence attests to the capture of rainwater as far back as 4,000 years ago, and the concept of rainwater harvesting in China may date back 6,000 years. Rainwater is valued for its purity and softness. It has a nearly neutral pH, and is free from disinfection by-products, salts, minerals, and other natural and man-made contaminants. Rainwater provides a water source when groundwater is unacceptable or unavailable, or it can augment limited groundwater supplies. The zero hardness of rainwater helps prevent scale on appliances, extending their use. Rainwater harvesting at households apart from fulfilling a families water needs, reduces their utility bills.

Rain water harvesting do away with the need for water distribution infrastructures, thereby avoiding the health risks associated with storage and distribution of drinking water. But along with the independence of rainwater harvesting systems comes the inherent responsibility of operation and maintenance like flush removal system, regularly cleaning roof surface and tanks, maintaining pumps, and filtering water. For potable systems, responsibilities include all of the above, and the owner must replace cartridge filters and maintain disinfection equipment on schedule, arrange to have water tested, and monitor tank levels. Rainwater used for drinking should be tested, at a minimum, for pathogens. Rain is the first form of water that we know in the hydrological cycle, hence is a primary source of water for us *(see Figure 1)*.

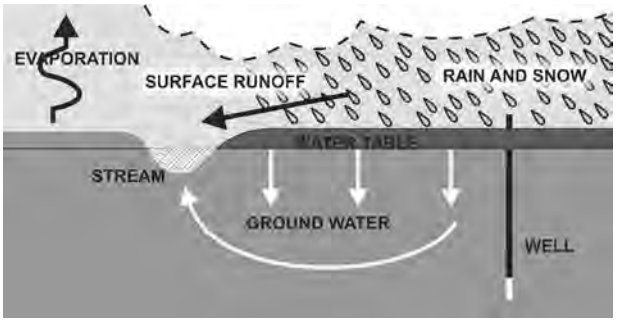

Fig.1 Where does all our water come from?

Rivers, lakes and ground water are all secondary sources of water. In present times, we depend entirely on such secondary sources of water. In the process, we have forgotten that rain is the ultimate source that needs all these secondary sources and remain ignorant of its value. Though the average rainfall in our country is 800 mm, it occurs in short spells of high intensity which gets wasted rapidly through surface runoff. Water harvesting means, to understand the value of rain, and to make optimum use of rainwater at the place where it falls

Rooftop Harvesting Systems

One of the Water Harvesting Technology Option is rooftop harvesting system. Rooftop catchment tanks are storage containers installed to receive runoff water from the roof of a house, a shed or a public building via a gutter and a down pipe.

The most suitable roofs for the purpose are those covered with iron sheet, tiles and fiberglass-sheet or open terrace floors. Existing asbestos sheets can also be used (because the health hazards from inhaling and ingesting asbestos fibre is only related to the production and construction process) Thatched roofs too have been used particularly for traditional systems. But they give a much lower yield and often produce coloured water.

How to Harvest Rainwater

Broadly, rainwater can be harvested for two purposes: Stored for ready use in containers above or below the ground or Charged into soil for withdrawal later (groundwater recharging-fig.2).

1. Catchments

The catchment of a water harvesting system is the surface which receives rainfall directly and contributes the water to the system. It can be a paved area like a terrace or courtyard of a building, or an unpaved area like a lawn or open ground. Temporary structures like sloping roofs can also act as catchments.

***Ms.J.Kanagavalli,** Programme Leader, DHAN Vayalagam (Tank) Foundation.

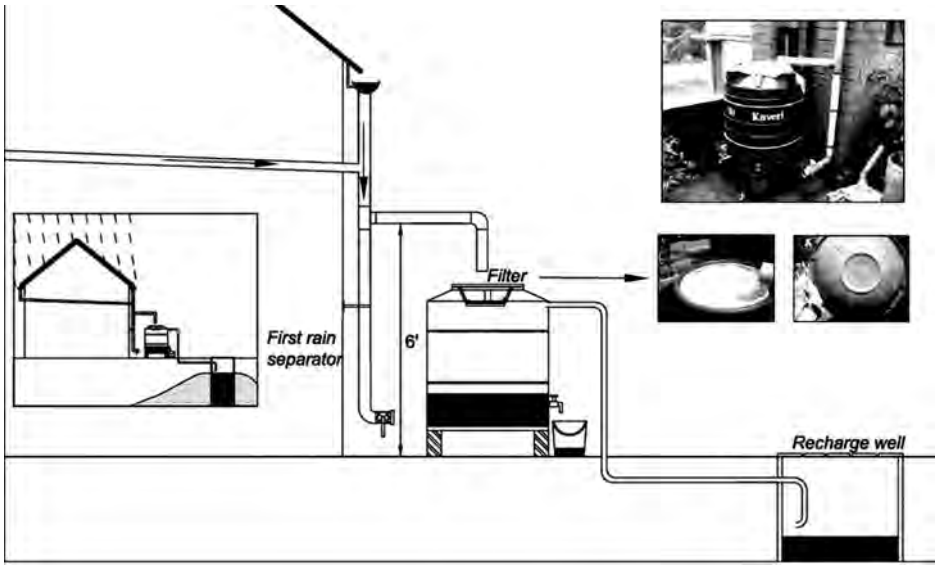

Fig.2. Rainwater can be recharged into the ground

Fig.3. Elements of typical water harvesting system

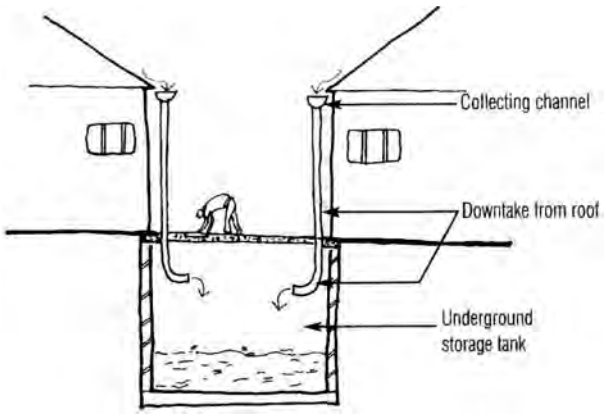

Fig.6. Rainwater can be stored in underground tanks as in this traditional rainwater harvesting system

2. Conduits

Conduits are the pipelines or drains that carry rainwater from the catchment or rooftop to the harvesting system. Conduits may be of any material like polyvinylchloride (PVC), asbestos or galvanized iron (GI), materials that are commonly available (Fig.3).

Storing rainwater for direct use

Rooftop harvesting has been practiced since ages, and even today it is practiced in many places throughout the world. In some cases, the rooftop harvesting system is little more a split pipe or bamboo directing runoff from the roof into an old oil drum placed near the roof *(see Fig.4).*

Generally, runoff from only paved surfaces is used for storing, since it is relatively free of bacteriological contamination. Drain pipes that collect water from the catchment (rooftop) are diverted to the storage container.

To prevent leaves and debris from entering the system, mesh filters should be provided at the mouth of the drain pipe *(see figure 5)*. Further, a first-flush device should be provided in the conduit before it connects to the storage container. If the stored water is to be used for drinking purposes, a sand filter should also be provided.

An underground RCC/masonry tank can be used for storage of the rainwater. The tank can be installed inside the basemen of a building (see figure 9) or outside the building. Pre-fabricated tanks such as PVC can be installed above the ground. Each tank must have an overflow system for situations when excess water

Fig.5. A grill prevents debris from entering the drain pipe

enters the tank. The overflow can be connected to the drainage system.

General design features

Rooftop water harvesting systems can provide good quality potable water if the design features outlined below are taken into account.

Design considerations for rooftop catchment systems

- The substances that go into the making of the roof should be non-toxic in nature.
- Roof surfaces should be smooth, hard and dense since they are easier to clean and are less likely to be damaged and release materials/ fibres into the water.
- Roof painting is not advisable since most paints contain toxic substances and may peel off.
- No overhanging trees should be left near the roof.
- The nesting of birds on the roof should be prevented.
- All gutter ends should be fitted with a wire mesh screen to keep out leaves, etc.
- A first-flush rainfall capacity, such as a detachable down pipe section, should be installed.
- A hygienic soak away channel should be built at water outlets and a screened overflow
- Pipe should be provided.
- The storage tank should have a tight fitting roof that excludes light, a manhole cover and a flushing pipe at the base of the tank (for standing tanks).
- There should be a reliable sanitary extraction device such as a gravity tap or a hand pump, to avoid contamination of the water in the tank.
- There should be no possibility of contaminated waste water flowing into the tank (especially for tanks installed at ground level).
- Water from other sources, unless it is a reliable source, should not be emptied into the tank through pipe connections or the manhole cover.

Design of system components

Rooftop catchment system has three main components, viz. a roof, a guttering and first flush device and a storage tank.

a. The roof: The roof should be smooth, made of non-toxic substances and sufficiently large to fill the tank with the available rainfall conditions. Existing roofs of houses and public buildings can be used for a rooftop catchment system. In some cases enlarged or additional roofed structures can be built.

b. Guttering and first-flush device: With all roof catchment tanks, the first rainwater running off the roof should be discarded. This helps keep the water potable because this first flush of rainwater contains large quantities of leaves and bird droppings.

Guttering is intended to protect the building by collecting the water running off the roof and direct it, via a down pipe, to the storage tank. Gutters should have a uniform slope of 0.5 per cent large enough to collect the heavy runoff from high-intensity rain.

Gutters are installed to capture rainwater running off the eaves of a building. Some gutter installers can provide continuous or seamless gutters. For potable water systems, lea cannot be used as gutter solder, as is sometimes the case in older metal gutters. The slightly acidic quality of rain could dissolve lead and thus contaminate the water supply. The most common materials for gutters and downspouts are half-round PVC, vinyl, pipe, seamless aluminum, and galvanized steel. Seamless aluminum gutters are usually installed by professionals, and, therefore are more expensive than other options. Regardless of material, other necessary components in addition to the horizontal gutters are the drop outlet, which routes water from the gutters downward and at least two 45-degree elbows which allow the downspout pipe to snug to the side of the house. Additional components include the hardware, brackets, and straps to fasten the gutters and downspout to the fascia and the wall.

c. The tank: Water tanks using ferrocement technology come in different designs with volumes ranging between 2m^3 and 200 m^3. For example, a free standing cylindrical tank can be built in sizes between 10 and 30 m^3, while a capacity of up to 200 m^3 is possible with sub-surface covered tanks. The latter is most economical when the capacity exceeds 50m^3.

Design of storage tank

The quantity of water stored in a water harvesting system depends on the size of the catchment area and the size of the storage tank. The storage tank has to be designed according to the water requirements, rainfall and catchment water availability.

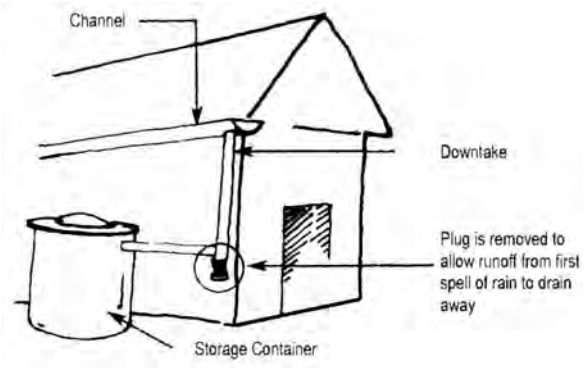

Fig.6. A simple first-flush device used traditionally

Recharging groundwater aquifers

Various kinds of recharge structures are possible which can ensure that rainwater percolates in the ground instead of draining away from the surface. While some structures promote the percolation of water through soil strata at shallower depth (e.g., recharge trenches, permeable pavements), others conduct water to greater depths from where it joins the groundwater (e.g., recharge wells). At many locations, existing features like wells, pits and tanks can be modified to be used as recharge structures, eliminating the need to construct any structures afresh.

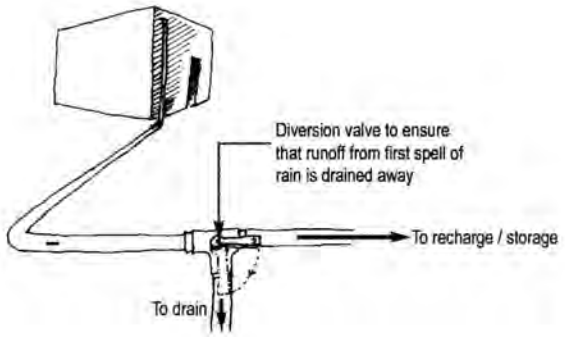

Fig.7. A diversion valve that can be used in water harvesting systems

Design parameters for storage tanks

Average annual rainfall, Size of the catchment and Drinking water requirement are the factors to be considered. Suppose the system has to be designed for meeting drinking water requirement of a five member family living in a building with a rooftop are of 100 sq m. Average annual rainfall in the region is 900 mm (average annual rainfall in Madurai is 2200 mm). Daily drinking water requirement per person (drinking and cooking) is 10 litres.

We shall first calculate the maximum amount of rainfall that can be harvested from the rooftop.

Following details are available

Area of the catchment (A)	=	100 sq.m
Average annual rainfall (R)	=	900 mm (0.9 m)
Runoff coefficient (C)	=	0.85
Annual water harvesting potential from 100 sq.m roof		
	=	A x R x C
	=	100 x 0.9 x 0.85
	=	76.5 cu.m (76,500 litres)

The tank capacity has to be designed for the dry period, i.e., the period of dry spell. With the two monsoons extending over seven months, dry season is of 152 days. Drinking water requirement for the family during the dry season.

= 152 x 5 x 10
= 76000 litres

As a safety factor, the tank should be built 20 per cent larger than required, i.e., 14700 litres. This tank can meet the basic drinking water requirement of a 5-member family for the dry period.

Management and Maintenance

Rooftop catchment tanks, like all water supply systems, demand periodic management and maintenance to ensure a reliable and high quality water supply. If the various components of the system are not regularly cleaned water use is not properly managed, possible

problems are not identified or necessary repairs not performed, the roof catchment system will cease to provide reliable good quality supplies.

Just before the rainy season, the whole system (roof catchment, gutters, pipes, screens, first-flush and overflow) should be checked and preferably cleaned after every dry period exceeding a month. At the end of the dry season and just before the first shower of rain is anticipated, the storage tank should be scrubbed and flushed of all sediment and debris (the tank should be re-filled afterwards with a few centimeters of clean water to prevent cracking). Ensure timely service (before the first rains are due) of all tank features, including replacement of all worn .screens and servicing of the outlet tap or hand pump.

Water use Management

Control over the quantity of water abstracted from the tank is important to optimize water use. Water use should be managed so that the supply is sufficient to last through the dry season. Failure to do so will mean exhausting all the stored water. In effect it will mean going back to where the user began, i.e. trekking long distances for poor quality water. On the other hand, under-utilization of the water source due to severe rationing may leave the user dissatisfied with the level of the service provided.

Quality of stored water

Rainwater collected from rooftops is free of mineral pollutants like fluoride and calcium salts which are generally found in groundwater. But, it is likely to be contaminated with air pollutants and surface contaminants (silt, dust). All these types of contaminations can be prevented to a large extent by ensuring that the runoff from the first 10-20 minutes of rainfall is flushed off. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces is arrested by the grill at the terrace outlet for rainwater.

Remaining contaminants like silt and blow dirt can be removed by sedimentation (settlement) and filtration. Additionally, biological contamination can be removed by disinfecting the water through boiling, chemical disinfection (chlorination) and filtration (activated charcoal and sand filters) and ceramic filters.

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Field Notes - Climate Change

Division of labor

We have purchased two acres of farm land recently. We have constructed a farm pond there. We wish you to support us for tank silt application. But we do not have enough space for planting trees.

My mother-in-law is the member of Mariyamman vayalaga Kanmai kuzhu (SHG) through which we are able get timely credit for our farm operations. My mother-in-law takes care of 70 sheeps, while I and my husband take care of the agriculture.

-Adaikalam w/o Samayan, 30 years, *Kilangulam*

Uravugal Kalanjiam facilitates Livelihood Development

Devanampattinam is one of the tsunami-affected villages in Cuddalore district. DHAN Foundation is working in this village since January 2005. It has organized the victims into SHGs and supported to restart their livelihoods. The fisher folks were supported to buy nets and renovate their damaged boats. As per the international standard (Sphere Standard 2004), the poor households in disaster-affected areas were covered through restoration programmes. In 2011, DHAN Foundation facilitated the promotion of Uruvugal SHGs by organizing left-out labourers and poor families. The details given below narrate how this group facilitated enterprise development.

Everyone is Our Relative – Origin of the Group Name

The Tamil meaning of the term "Uravugal" means relatives. The group has 20 members representing five different caste that include, Fisher folk, Mudaliar, Naidu, Padayatchi and Parvatharajakulam. All these members live in a same street irrespective of differences.

Nandini the treasurer of the group said, "We are one, and we don't find any differences based on caste. When we came together for the first time, we decided to name our group as Uravugal as we consider everyone as our relative. Our group members have helped each at times of hardships."

Tsunami – Vanished Hopes

"Our village has seen many changes in last ten years. Previously, Devanampattinam was known for floriculture and flowers produced here were marketed in Chennai and other cities before the tsunami disaster. My husband and I used to work in this field in morning and evening to collect flowers. We used to get ₹ 1 per 100 gram of flower collected. Even during the festival days, we used to work in the field as it provides regular income to us. Garland preparation was the home-based work for the rural women. The tsunami waves in 2004 inundated and damaged the floriculture fields. Our livelihood was directly affected. After tsunami, the soil salinity has increased and these days very few are engaged in floriculture said Vijeya president of the group.

Scary Cycone and Financial Status of the families

"You may find our home to be very new, but few days before our situation was pathetic said Vijeya". "We renovated this house a few months before with asbestos roof with support of my group and relatives. Previously we had thatched roof. The scary thane cyclone damaged our roof, which fell into the home. In that situation, we saved whatever we could and stayed at Nadini's home for about 5 months. She also shared food with us and I am thankful for her kind support. Without employment opportunity, we struggled a lot in that situation.

My husband who is working as a mason did not get regular employment. However, this was not the first occasion that we suffered for the basic needs. Earlier our family income was very low. Before joining group, I used to get loan from the moneylenders at an interest rate of 4% per month. We will get ₹ 870 and we need to pay ₹ 1000 in 100 days (Rs. 10 per day). This lending system is called as Thandal. There is another group of people engaged in lending at 5% interest rate. Last time I took ₹ 10000 for my home needs. Not only me, but also all our members have fallen into this trap at regular intervals" she added. "When –my husband suffered from forehand fracture, he preferred traditional healers, since hospital treatment was costlier to them. When he faced fracture for the second time, the group extended support for the hospital treatment" said Vijeya.

Why this group was promoted?

Jeyanthi the secretary of the group replied, "We have promoted this group to access credit at cheaper interest rate, save money and to promote livelihood activities." Nandini added that, "some the members in the same village have initiated dairy activity. We too have plans to promote dairy activity. We need to generate income and contribute for our children education, and family needs."

How the group contributed to economic well-being?

"Women of my community are engaged in fishery-based activities. None of them is engaged in other than fisheries-based activities. Rather being idle at home, I thought I can do garment sale to support my family. I expressed my thought with the group and my husband finally everyone agreed. Now I have started selling cotton and poonam variety sarees within the village. Before three months, I took ₹ 10000 from the group and started selling cotton sarees with a margin of about ₹ 20 - 30. I was able to sell completely and gain Rs. 1200. Since this activity is profitable, I borrowed ₹ 10000 from my relative and purchased sarees from Chennai. Presently I am selling these sarees with Rs. 50 margin. Already I have gained ₹ 2100 by selling sarees. Since it is Deepavali (Indian Festival) time, I believe I can earn more out of this business. Presently I am selling with a margin of ₹ 50 and if I sell it for credit, I can increase the margin to ₹ 100. Whenever I came in late after buying sarees from chennai, my husband used to support me to reach home. Recently, when my children came home he took ₹ 500 from me. Now I am able to support my husband and my children at times of financial needs, said Nandini. "Earlier, I had only one grinder, using which I produced and marketed wet flour. Due to frequent power-cuts, and increased heat due to continuous usage of existing grinder, I decided to buy another grinder. In Cuddalore district, we face about 8 – 10 hours of power-cut during the critical hours. I expressed the credit need for purchasing a second grinder and the group supported me by providing Rs. 5000 credit. Now I am using two grinders to produce wet flour.

Since I have another grinder, I have plans to expand my business. With about ₹ 350 investment per day I earn ₹ 50 - 60. My husband sells this wet flour to five shops. We sell 41 packets at ₹ 10 per packet and the retailers sell at ₹ 16 per packet. Apart from selling flour to shops, we retain two packets for home consumption. Thus, we are able to make money and cook food for ourselves said Vijeya. S.Jeyanthi, said, I have started (duplicate jewels) renting jewels with the support of my group. I have started this very recently and people in this village are highly interested hiring jewels. I took ₹ 15,000 from my group to initiate this activity. After initiating this activity routine schedule has changed. This activity is profitable.

What we have gained through group?

All the three entrepreneurs expressed that after joining group, they have better access to information on recent updates, mobility has increased, they were able to initiate small trade and interact with the bankers. Members also said, previously they have visited banks only for mortgaging their jewels and now they feel that they are competent enough to deal with bankers. They also expressed that, they were able to learn from each other. Through cluster development association, they have learned about group level norms, dairy activity, and group level norms.

What we wish to do in future?

Nandini and Vijeya have plans to promote a canteen, as there is a teacher-training institute near to their home. Nandini believes that her group will support her in promoting a canteen. In addition, Nandini has independent plan of promoting dairy activity. Vijeya has an independent plan to expand her wet flour selling business. She and her husband are planning to identify new shops to sell the flour. Jeyanthi has planned to focus her existing activity. □

Being a "Climate sensitive citizen"

R.Sivakumar*

We have started feeling the impact of climate change. The human factor is playing a greater role in Climate change leave alone the natural factors. As a responsible human beings and citizens we should try our best to remain and live as a climate sensitive person thereby create a society that lives in accordance with nature. The following are the simple means to express that we care for nature and wish to reduce the impacts of climate change.

Grow more trees

- Reduce usage of wood and wood based materials to prevent cutting of trees.
- Planting and maintaining at least two trees per house. In urban people never leave space for growing trees and cover their entire plot with trees. While planning to construct a house, leave some space to grow plants and trees.
- Kitchen/terrace garden is a effective means through which we can grow plants recycling the kitchen waste and used water
- Planting trees in groups at common places and subsequently maintaining them

Vehicle usage and maintenance

- If you travel single, kindly use public transport. Avoid two wheeler and four wheelers which saves petrol. This apart from supporting to the cause of adapting to climate change, indirectly contributes to nations wealth
- Using bicycle for short distance travel or going by walk
- Maintaining adequate air pressure in your two wheeler and four wheeler tyre to reduce energy consumption

If we reduce use of Car /Two wheeler for 5 km we can save 1.5 kg of carbon

Energy Efficient electrical instruments

- Avoid using Incandescent lamps and go for CFL (Condensed Florescent lamp) bulbs or LED bulbs (light emission diode)
- Use electrical appliances with five star rating. The higher the star rating given, higher is the energy efficiency of the electrical instrument. The cost may seem high initially but they will also turn economical in long run
- While living in apartments/multi-storied building, avoid using Lift . As far as possible go by walk which is also good for your health
- Even if not in use for few minutes, switch of the fans, lights television, geyser and other electrical items both at office and at home. It is also better to unplug the wires. While using geyser plan such a way that all take a bath at a stretch to avoid it being in on for many hours, which will also cost your electricity consumption bill too much. Moreover going solar is the best option especially for geyser, lights and fan.
- While constructing a house plan in such a way that your home gets enough natural light and air. Painting your roof top with white will reflect heat and will keep your home cool.
- While using washing machine fill it to its full capacity, to avoid repeated usage.
- If you are having an air conditioner do not over cool the room and avoid using it in times and days during which it is not needed.

Water usage and its protection

- The water that is received through rains should not go wasted. It should not stagnate in unwanted places, go into drainage and run off into seas to maximum extent possible. Our water harvesting structure and plan should be devised accordingly.
- At home rain water harvesting can go a long way in ensuring the consumption needs of the family including drinking water, if proper methodology and purification process are followed. The total need of a family in a year can be easily met if we start planning and implementing rain water harvesting technique.
- The existing water bodies should be renovated and properly maintained. Desilting, maintaining the inlet, outlet and proper bunding of such water bodies will support water conservation.

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- Sand mining from rivers should be prevented ad check dams should be constructed wherever necessary. This will facilitate ground water recharge in the neighboring areas
- Pollution of water bodies through industrial wastes and other domestic waste should be prevented. Any water from industries should be led into rivers only after purification.
- Encroachment of water bodies, their approach channels and outlets should be prevented. Also dumping of garbage in these sites should be prevented
- We should know the value of water and use it judiciously in every act we do. Ensure that all the pipelines in your house does not have any leakage
- Constructing new farm ponds in lands of farmers by educating them regarding its importance.
- Recycling of waste water to maximum extent possible for reuse.

Avoid plastic

- Plastic a byproduct of petroleum products has started occupying our life and the worst part is they do not degrade easily. Avoiding usage of plastic by carrying a cloth bag wherever we go will reduce plastic usage.
- Keeping degradable waste and non-degradable waste separately for disposal so that they can be treated accordingly.

Use of nonconventional energy

- Going solar is the best available option. Also going for DC appliances which can use solar electricity directly can minimize the electrical consumption to greater extent. While planning a house, plan for both AC and DC current, with separate wiring based on your need. This works bests for offices than for home where lot of electricity is consumed during day time.
- Electricity generation through wind mills
- Biogas plants in villages which can use cow dung for producing gas for cooking. □

Development News - Agriculture outlook -2013 -2022

The OECD FAO agricultural outlook report 2013 -2022h projects a slowdown in population growth just to 1 % per annum and that a additional 742 million mouths have to be fed by 2022, which is a crucial factor in deciding the supply and demand of agricultural commodities. The price of the agricultural products are projected to shoot very steeply over a decade, compared to earlier years and the symptoms of such higher rates has already began. Factors such as rising energy and oil prices which leads to higher production costs, slower production growth despite strong and rising demands will play a major role in price increase to historically higher levels. The slow rate of agricultural production growth is also expected to make commodity markets susceptible to price volatility. As a consequence, coupled with steep increase of price over the time price fluctuations and uncertainties will play a havoc in the market.

The population growth in developing countries will continue to be at higher rate, despite global slowdown in population and hence will contribute more to the demand growth of agricultural products. The developing countries with good income probabilities in future are projected to diversify their diets viz. moving away from basic staples and grains to higher protein foods including meats and dairy products.

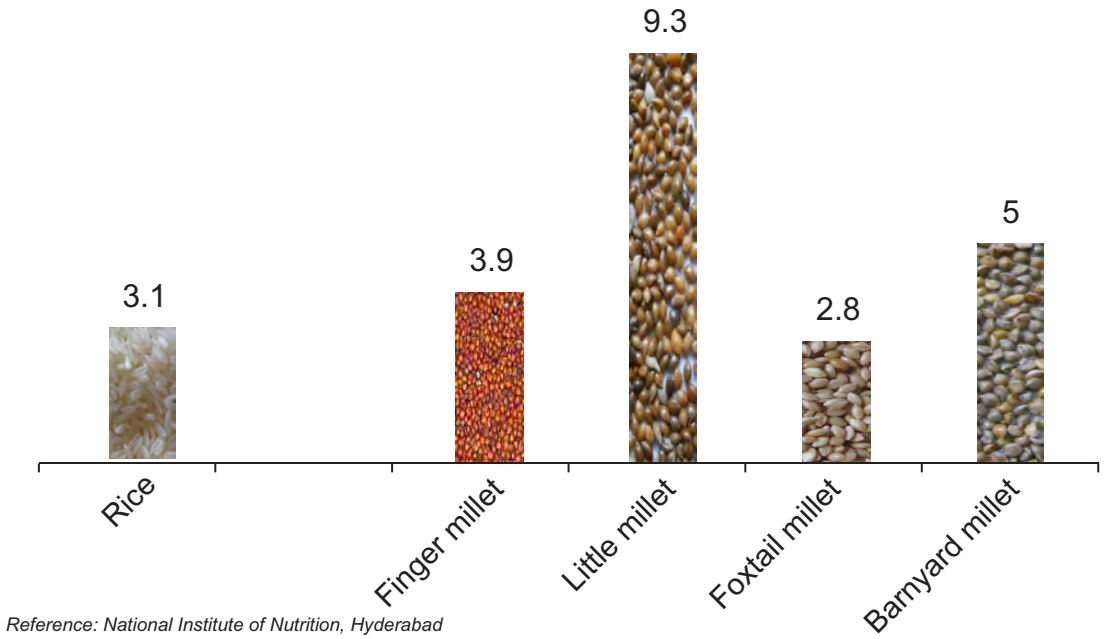
Rich in Iron

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

Iron content in 100 gm of small millets



Reference: National Institute of Nutrition, Hyderabad

Sustainable Livelihoods for Food and Nutrition Security

Food and nutrition security is built on four pillars – availability, access, use and stability. Enhancing livelihoods of the poor and vulnerable households brings them access to food and nutrition, also gives stability for their future consumption. Building sustainable livelihoods needs reinforcing people's capacities and self-help by organising them, enhancing their capabilities and assets, improving their access to resources and markets, contextualising priorities and livelihood interventions.

With accumulated savings and loan from banks, SHGs promoted by DHAN have generated credit worth of ₹1,692 crore for livelihood enhancement of their member households. Skill building and market linkages have helped over 42,500 people.

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