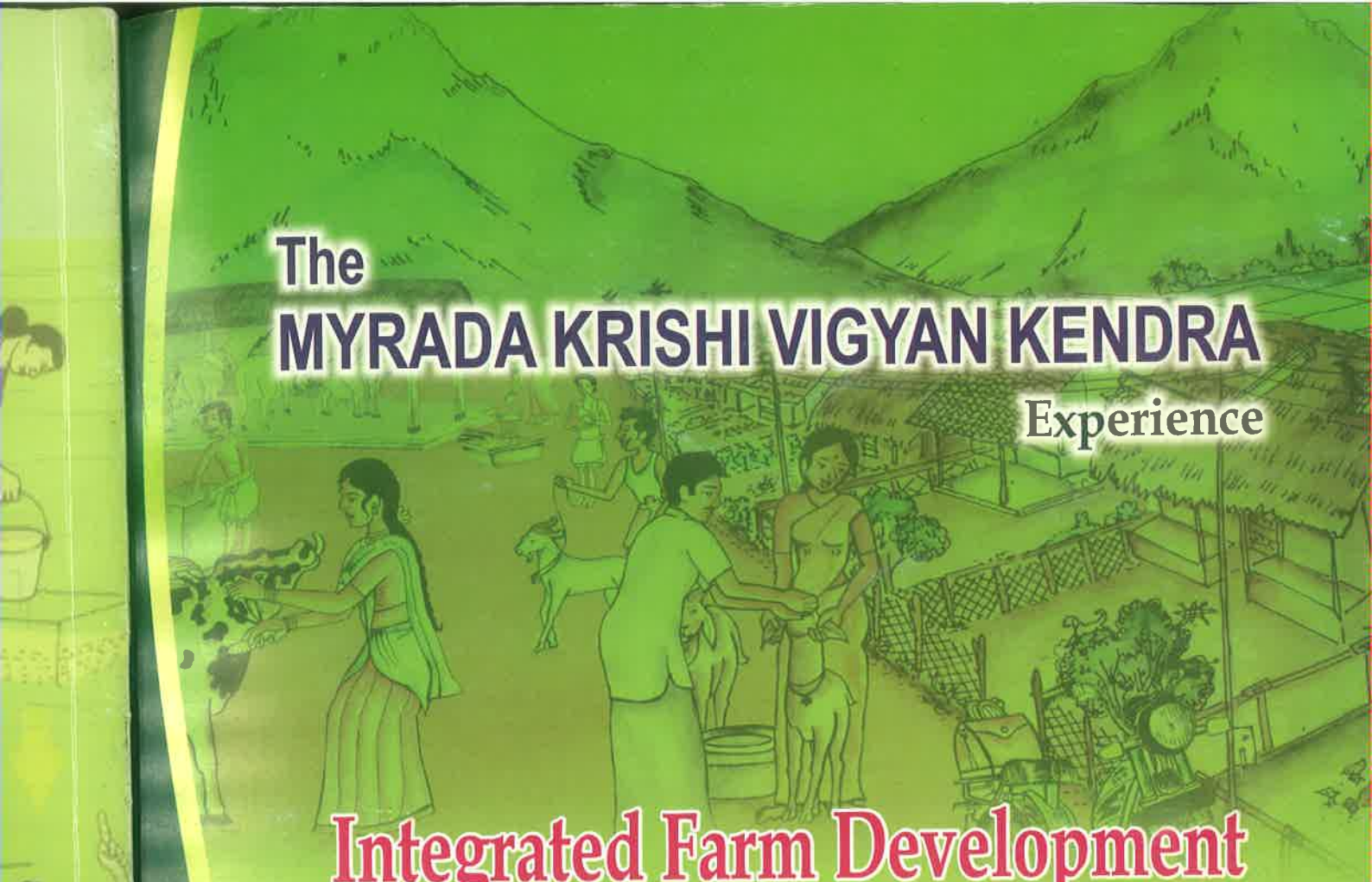

The MYRADA KRISHI VIGYAN KENDRA Experience

Integrated Farm Development

(Effective utilization of Farm, Home and Human waste)

- users' guide

MYRADA KRISHI VIGYAN KENDRA

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The
MYRADA Krishi Vigyan Kendra

Experience

Integrated Farm Development
- users' guide

December 2008

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भाकृअनुप
ICAR

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Foreword

Advances in technology, changes in the crop prices, rising fuel and transportation costs, and growing public concern over the environmental impact of current farming and feedlot practices, have set the stage for a remarkable opportunity to create an Integrated Farm Development (IFD).

An IFD can reduce commodity transportation costs, permit the co-utilization of facilities, equipment and personnel, and allow for the reuse of energy, water and nutrients throughout the system. This significantly decreases the harmful environmental impact of some of today's current production practices.

Deploying the IFD will benefit farmers monetarily by creating new markets for their agricultural products. Because of its near "zero-discharge" process, the IFD can mitigate possible pollution problems as well as create new sources of employment in rural areas. This can help economic development in areas of the country that have least benefited from the recent economic boom, while simultaneously improving environmental quality.

The experiences outlined in this document has consistently revealed that the IFD is an advanced, highly beneficial, process to produce biofuels, biopower, and biofertilizers.

I am pleased to note that this guide was produced by a unique outcome on the experiences of **MYRADA Krishi Vigyan Kendra, Erode**. I hope this document is useful in continuing the important work on Integrated Farm Development that will lead to produce biofuels, bio power, and bio-fertilizers.

I appreciate and congratulate the enthusiastic young team of **MYRADA Krishi Vigyan Kendra, Erode** for their efforts in bringing out this manual.

13/06/08

13th June 2008
Bangalore

S.PRABHU KUMAR
Zonal Coordinator

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PREFACE

Integrated Farm Development is an innovative concept in farming wherein integration of various resources (farm waste) is utilized in order to reap maximum benefits out of them. The transition strategy or technique from inorganic agriculture to organic agriculture is being adopted in this approach.

In the year 2001, MYRADA-KVK initiated the IFD Programme based on the LEISA concept. The main objective of the IFD is the effective utilization and recycling of farm wastes and resources. Farmers needs are numerous and different. Our KVK has made an attempt to converge the multidisciplinary approach towards each individual farmers need through experimentation of IFD at their farm level. In order to accomplish this task, MYRADA-KVK had developed linkage with various resource institutions like TNAU, DRDA, UNICEF, KVIC and ministry of Food and Civil supplies. The Contribution of NOVIB needs to be acknowledged specially in this occasion. These resource institutions have attributed to the success of the Programme whose resources have been pooled together in the IFD Programme.

Implementation of IFD was taken up by our KVK with the participatory approach of community based organizations like SHGs and farmers group who actively took part in the Programme. People from line departments, NGOs and farmers with in the state and also from other parts of the country visited the IFD villages, were convinced by the concept and replicated the IFD model in their locations. The journey of IFD started in 2001 with 8 number of farm families and now after seven years has spread to 46 villages with 679 farm families.

As different stakeholders were visiting the IFD Programme frequently, KVK team realized the need and importance to bring out an IFD users guide. So, KVK made an attempt to publish a 'Users guide on IFD' for the benefit of extension functionaries, NGOs and farming community. I take immense pleasure in releasing this publication and I am thankful to the KVK team who have implemented the Programme at farm level and contributed information for this publication.

P. ALAGESAN
Programme coordinator

18th June 2008
Gobichettipalayam

ACKNOWLEDGEMENT

We acknowledge the contributions of the persons listed here who have provided crucial inputs.

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INTRODUCTION

We could remember our ancestors practicing agriculture with more commitment to feed their family and to others with available farm resources. Continuous increase in population and reduction of land for agricultural production forced them to increase the yield to meet the demand. There emerged "Green Revolution" in 1960s which played a critical role in accelerating our agricultural production to meet out the food requirement for entire population. At that time, use of high yielding varieties, use of chemical fertilizers and pesticides and excessive irrigation were practiced to maximize the grain yield.

The green revolution resulted in manifold increase (4 times) in production but on the other side, the consumption of chemical fertilizers and pesticides increased to 60 times due to the excessive use of pesticides and chemicals. Now our country is one among the highest user of pesticides in the world. This situation led to disturbances in soil reaction, development of nutrient imbalances in plants, increased susceptibility to pest and diseases, reduction in legume root nodulation and decrease in soil life. More over animals, human and environment are facing tremendous hazards.

The realization of such detrimental effects of chemical fertilizers when used continuously in large quantities in the absence of organic components has triggered interest for alternative system to enrich soil fertility to conserve the environment and health of the people. Then the concept of Low External Input for Sustainable Agriculture (LEISA) emerged in order to minimize the consumption of pesticides and fertilizers and also to reduce the input cost for cultivation. The scaling up of LEISA practices sparked the MYRADA KVK to think of a farmer's friendly practice to use the farm resources effectively in an eco-friendly way with less investment. The new approach thus developed and was named as *"Integrated Farm Development"*.

The MKVK has demonstrated this model from 2001 based on LEISA technologies to motivate the farmers to follow the IFD practices. The main objective of the IFD concept is to effectively utilize and recycle the farm waste and resources for sustainable agriculture.

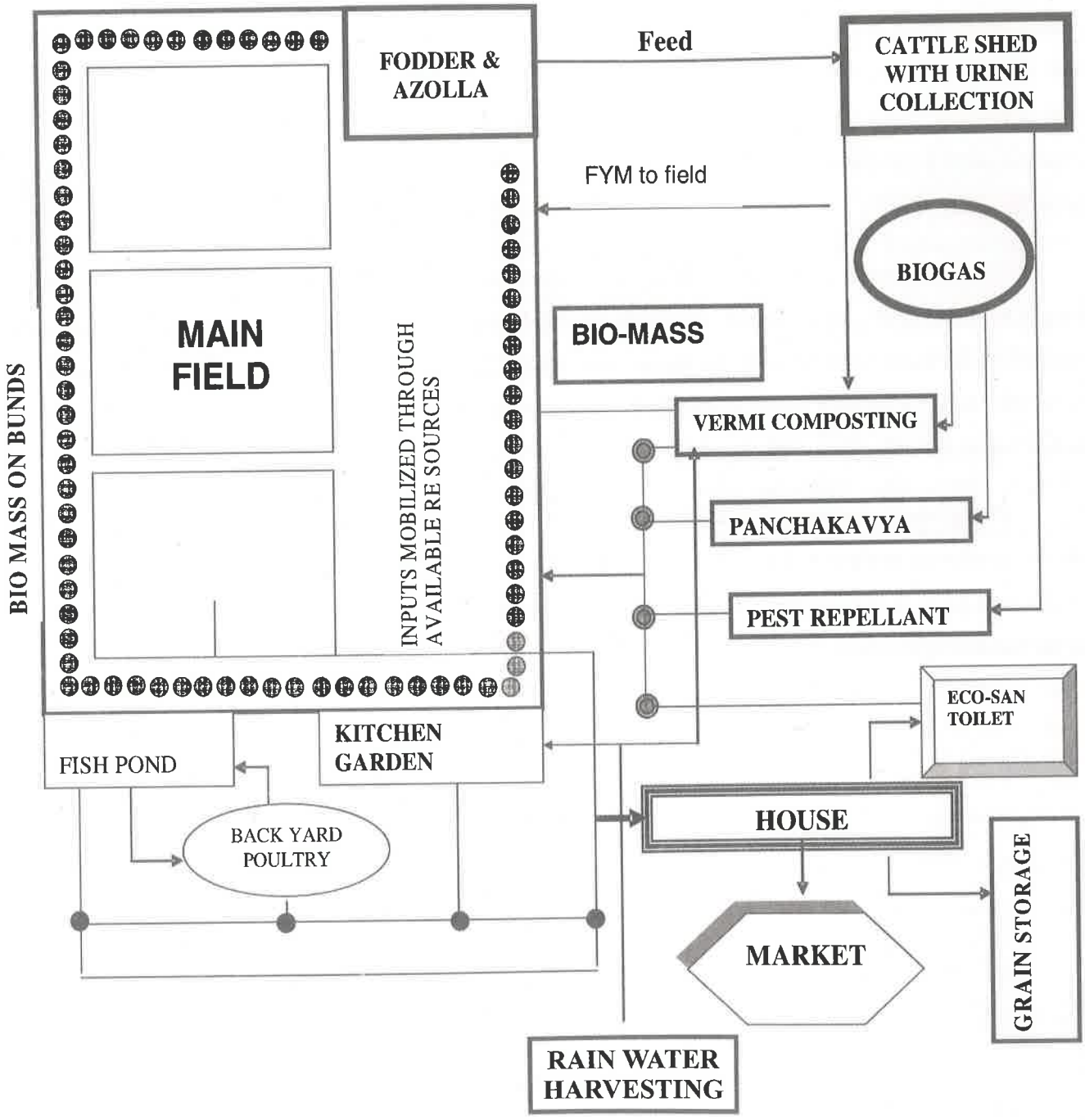
Cont...

Cattle are important component in the farming community. If the cattle resources are utilized properly, the cost towards purchase of inputs for farming can be minimized. The IFD model is emphasizing on recycling of cattle resources along with farm waste in an integrated manner. Various organic components can be prepared from this approach to enrich the soil and the crop growth that leads to increase in productivity. The IFD is a wholistic approach comprising of many individual components serving the needs of individual farmers. IFD is being implemented by the KVK in 735 farm families of various parts of Erode District. In order to disseminate the field experience to other parts of the country, KVK has taken an initiative to develop a user friendly guide.

The "IFD guide" comprises 11 different components namely cattle shed with cow urine collection pit, biogas, vermicompost, panchakavya, crop pest repellent, green fodder, kitchen garden, grain storage, ecological sanitation, on bund biomass and rain water harvesting. The rational, purpose served by the technology, its feasibility along with case study based on kendra experience has also been documented and explained for better understanding by the farmers

This guide is structured in such a way that its adaptability is not restricted only to the district but can also be effectively implemented by the farmers according to their farming system and available farm resources at different parts of the country. This guide would be very useful for the farmers and extension functionaries in the field of agriculture.

Integrated Farm Development - Design



CATTLE SHED WITH URINE COLLECTION PIT

Definition

A Cattle shed is the place where animals are maintained in a hygienic manner with safe and good environment condition. Urine collection pit is attached unit along with cattle shed to harvest and effectively utilize the cattle urine for various organic input preparations.

Rationale

An efficient management of cattle will be incomplete with out a well planned and adequate space provided for cattle to protect them from rain, driving winds, excessive heat, cold and dampness. So the cattle shed emphasize on safe and good environmental condition for the animal and ensures great care and hygiene. Cattle shed with urine collection pit helps for safe disposal of cow dung and harvest urine which facilitates effective recycling.

Purpose served:

1. Protect the animals from rain, wind, excessive heat, cold and dampness and also prevents them from transmitted diseases
2. Good resting place for animals
3. Harvested cowdung and cowurine are used as inputs in the preparation of biogas, vermicompost, panchakavya and crop pest repellant. These materials reduce cost of purchase of external inputs (Chemical fertilizers and pesticides)
4. Well planned cowshed helps to manage the available space effectively

Caution

"An uneven hard floor is very uncomfortable and unhealthy for animals. A wet, slippery floor may cause injuries such as fracture, tearing and over stretching of ligaments and even abortion if the animal concerned is pregnant".

CATTLE SHED WITH URINE COLLECTION PIT

Mr. Nagesh and family is living in M. P Doddi village of Talavadi block, a member of Basweswara sangha. He says that, the construction of cattle shed yields him daily 20 kg of cow dung and 10-15 litres of urine (collected only during the night time) which are harvested from 4 cows, which ultimately helped him to produce Panchagavya and Crop pest repellant.

Before KVK intervention they tied their animals in an unhygienic cattle shed and resources from cows were wasted. But now he improved his cattle shed through which the animal resources are effectively collected and utilized

Rani, wife of Mr. Nagesh said that now their cows look healthy and free from diseases. Earlier they used to spend on an average Rs.500/month for medical treatment of the animals but now there is no such expense for medication.

The estimation detail for construction of cowshed (Two Cows)

Sl	particulars	Expenditure details (Rs)			Total cost
		Construction Material	Labour charge	Unfocsen item	
1	Thatched roof	6,000	1,500	500	8,000
2	AC Sheet	9,000	2,000	650	11,650

Whom to contact

MYRADA KVK

State Veterinary & Agricultural Universities

Component - 2

BIO GAS

Definition

Biogas is produced by anaerobic digestion or fermentation of organic matter including Cow dung, Food waste, Human waste, kitchen waste and any other biodegradable matters under anaerobic conditions.

Rationale

Farm wastes are rich in energy sources. Yet they were not used in an appropriate method to convert them into renewable energy. Biogas is found to be effective method in addressing the existing demand in rural energy system. Further it is an Eco-friendly way of producing methane gas by utilizing of farm resources within the affordable cost.

More about Biogas – Farm, Home and Environment....

Biogas plants can yield a whole range of benefits for their users, the society and the environment. In general, the chief benefits being;

Farm

- Transformation of organic wastes into high quality organic manure, which can supplement to chemical fertilizers and reduce their deleterious effect on soil and environment.
- Better manure and fertile soil condition resulting in improved crops. The manure is odorless and free from flies and mosquitoes.
- Weed seeds are not germinated in digested slurry when it is used as organic manure
- Conducive to environment through protection of forests, soil, water and air.

Home

- Biogas is clean, efficient fuel compared to other fuel resources like Cow Dung cake & firewood
- Saves women and children from drudgery of collection and carrying of firewood, exposure to smoke in the kitchen, and time consumed for cooking and cleaning of utensils
- Creation of hygienic conditions through reduction of pathogens, worm, eggs and flies.
- Biogas is a source of production of heat, light and electricity.
    - Biogas can be used in a specially designed burner for cooking. A biogas plant of 2 cu.m. Capacity is sufficient for providing cooking gas to a family consisting of four members.
    - Biogas can be used to operate a dual fuel engine and can replace up to 80% of diesel.
    - Gas lamps can be fueled by biogas. The requirement of gas for powering a 100 candle lamp (60 W) is 0.13 cu.m. per hour

Environment

- Provides a non-polluting and renewable source of energy
- Provides a source for decentralized power generation
- Safe disposal of animal waste (Farm resources), thereby creating hygienic and cleaner environment.

Biogas model-Floating-Drum type or Fibre Reinforced Plastic (FRP)

The floating-drum biogas plant consists of a deep well-shaped underground digester connected by inlet and outlet pipes. A mild-steel gas storage drum, inverted over the slurry, rises and falls around a guide pipe corresponding to the accumulation and withdrawal of gas.

2 cu.m.Size of bio-gas		
Sl	Particulars	Cost
1	Fibre drum	4,500
2	Materials	2,500
3	Construction & digging	1,800
4	Stove materials	1,000
5	Transport	200
	Total	10,000

The process

The substrate inputs like slurry, dry manure from cattle, pigs and poultry, raw materials such as corn or grass, organic waste including fats, vegetables and catering waste enter the fermenter where it is mixed, heated and agitated. The organic compounds are decomposed by methane bacteria and produce biogas and the processed digestate is separated for use as enriched manure.

Other Bio-Gas Models

Sl	Model	Size
1	KVIC Floating Drum Type Biogas Plants having digester made of bricks or stones	1 to 10 cubic metre
2	KVIC type biogas plants with ferro cement digester	1 to 10 cubic metre
3	KVIC type biogas plants with fibre reinforce plastic (FRP) gas holder	1 to 10 cubic metre
4	Deenbandhu Model (i) Brick masonry (ii) In Ferro Cement with in-situ technique	1 to 6 cubic metre
5	Pre-fabricated RCC fixed dome model	2 & 3 cubic metre
6	'Flxi' model Bag digester type plant mae of rubberized nylon fabric manufactured by Swastik Rubber Products Lt., Pune.	1 to 6 cubic metre

Size of plant and requirement of cattle dung

Size of metre	Quantity of cattle dung required daily	No. of cattle required
1 Cubic metre	25 Kg	2 - 3
2 Cubic metre	50 Kg	4 - 6
3 Cubic metre	75 Kg	7 - 9
4 Cubic metre	100 Kg	10 -12

Whom to contact

- Kadhi & Village Industries Commission (KVIC)
- District Rural Developmental Agency (DRDA)
- Block Development Office (BDO)
- State Agricultural Universities
- MYRADA KVK

VERMICOMPOST

Definition

Vermi-composting is the process of culturing of earthworms for digesting organic waste turning into useful compost/bio fertilizer. Earthworms are employed for a variety of uses in farming/agriculture

Rationale

Soil is the soul of infinite life. Indiscriminate and irrational usage of chemical fertilizers has led to soil degradation and soil infertility status, which has affected the crop growth and production. Incorporation of organic amendments will improve the soil nutrient status and thus bring back life to the soil Vermicompost is a process where in organic farm waste is converted into effective nutrient rich manure which promotes soil aeration and soil aggregation that ultimately enhances soil fertility and plant growth.

Purpose served

Vermicompost

1. Facilitates effective utilization of farm waste, converting them into rich manure or compost
2. Builds up soil microbes, increases availability of Nitrogen fixing and Phosphorous solublising bacteria
3. It is a reservoir of micronutrients, growth hormones like Auxin, Cytokinin, essential amino acids and vitamins which are necessary for plant growth
4. Keeps a check on plant parasitic nematodes

Tips

- *'Eudrillius eugienea'* (Exotic breed)*''Eisenia foetida' & 'Perionyx excavatus'* (Local breeds) are fast breeders and feed actively on organic matter.
- Mixture of cattle, sheep and vegetable waste forms ideal feed for worms
- Biogas slurry enhances vermi composting process

Preparation Method of vermicompost

Vermicomposting should be done under shelter to avoid direct sunlight or heavy downpour. The base materials to be used for vermicomposting are crop residues, tree leaves, animal dung, agricultural wastes, sugarcane trash, weeds/ hedge cuttings, effluent slurry from bio-gas plant, excreta of sheep and vegetable wastes. Materials like metals, foils, plastics, chemicals, oils, and solvents, glass, citrus products, heavily spiced food & high acid food, animal flesh, dog & cat manure should be avoided.

Steps to be followed:

- Select appropriate location for the compost preparation.
- Make a bed of 10 cm height using any of the base materials (coir waste, paddy husk, sugar cane trash etc) collected. Give a layer of soil on it. Sprinkle water on it to get a moisture level of 40-45%.The bed should appear wet.
- Mix the organic waste with cattle dung in equal quantity and pour appropriate quantity of water over it so as to make a homogenous mixture. Effluent slurry from bio-gas plant is best used for this. Keep this mixture for two weeks. During this period heating of substrate will take place. Give turning to the material 2-3 times at 4-5 days interval and transfer it on the layer of bedding prepared earlier.
- Introduce cocoons or worms (if culturing is done for the first time, it is advisable to introduce worms) in the bed at the rate of 2000 worms for 400 kg of feed mix as prepared in third step. Then the feed mix is to be spread uniformly on the culture bed.
- Cover the bed with Gunny cloth .Sprinkle water over the cloth periodically to keep gunny cloth wet. The worms feed actively on organic matter and assimilate only 5-10 % and rest is excreted as loose granular mounds of vermicastings on the surface away from the feed source. Thus the worms will convert the feed mix into vermicastings in 60 days. The vermi compost once formed completely will give the earthy smell (smell of moist soil).
- Take out the compost and make a heap in sunlight on a plastic sheet. Keep for 1-2 hours the worms will gather at the bottom of heap. Remove vermi compost from top and the worms when settle down at the bottom can be carefully collected for use in the next batch of vermi composting or for sale.

Take care....

- Moisture level in the bed should not exceed 40-50%.Water logging in the bed leads to anaerobic condition. This hampers normal activities of worms leading to weight loss and decline in worm biomass and population.
- For optimum results, temperature of bed should be within the range of 20-30 degree centigrade.
- Worms should not be injured during handling.
- Bed should be protected from predators like red ants, white ants, centipedes and others like toads, rats, cats, poultry birds and even dogs.
- Earth worms find it difficult to adopt themselves in new environment. Hence addition of inoculums (Bed material) from earlier habitat helps in early and easy adaptation to new site of rearing.

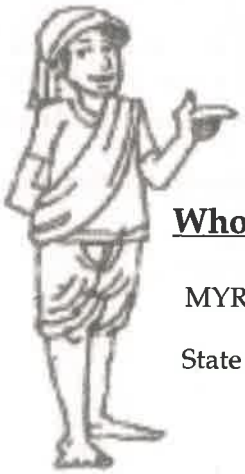
Cost and design

Type	Specifications	Cost
Brick line cement structure	1m x 1m x 0.3m	Cement structure - Rs.1,500.00 Worms - Rs.350.00 Base material - Own source **Total - Rs. 1,850.00**
Heap method	To the convenience but height of the heap should not exceed 45 cms	Worms - Rs.350.00 Base material - Own source **Total - Rs. 1,350.00**

"If we are able to manage Rats and Birds problem, heap system is found to be good for the vermicompost production because worm multiplication rate and manure conversion rate is high when compared to that of other types"

Ms. Kalaivani, a 48 year old woman farmer of Adireddiyur village is producing vermicompost for the past seven years. She has intensified the activity of vermicompost production after intervention of MYRADA KVK during year 2005. Now she owns six beds. She produces vermicompost by all methods (pit system, Heap and Brick line cement structure) using Eudrillius eugienea species. The raw materials viz., coconut husk, sugarcane trash, biogas slurry and leaf litters are used for the vermicompost production. The vermicompost being produced in her farm is used for groundnut, sesame, cumbu, ragi, cotton, tapioca, onion and vegetable cultivation.

Before resorting to organic agriculture, she used to apply inorganic fertilizers which led to hard crust formation of the soil. But now, she applies only farm yard manure and vermicompost which improved the status of the soil. The soil looks loose, friable, dark brown and structurally crumby in nature. She incorporates more than a ton of vermicompost in her field for every crop season. She had noticed a significant yield increase in groundnut (56%) after application of vermicompost comparing to the field where she had not used this organic manure. According to her it is not a laborious work as others do say and it has become a part of the routine work in a day. Apart from her own consumption (regular application of vermicompost) in the field, the surplus amount of vermicompost is being sold at the rate of Rs.4/Kg and till now she had sold six tons of vermicompost in and around Anthiyur region.



Whom to contact

MYRADA KVK

State Agricultural Universities

Component - 4

PANCHAKAVYA (Bio Growth Promoter)

Definition

The panchakavya, an organic formulation is unique combination of five products of cow (cow dung, urine, milk, curd and ghee) and other products / byproducts of plant origin.

Rationale

Organic production system was imperfect and continued to be incomplete for want of an input to replace foliar chemical fertilization, growth-promoting hormones and immunity boosters to pest and disease infestation. Thus Panchakavya helps to reduce input cost and to improve soil microbes' population.

Purpose served

- Panchakavya acts as excellent growth promoter which enhances the plant growth and yield.
- It largely corrects micronutrient deficiency and enhances insect and disease resistance in plants.
- It improves & hastens composting process
- It also acts as a good pest repellant

Process.....

- Mix 5kg of Cow dung, 5lit of cow urine with 5lit of water in a mud or plastic container and stir it daily (morning and evening) 50 times clock wise and anti clock wise up to **15 days**.
- On **16th day** with above solution, add 2 lit of fermented curd (fermented for 15 days), 2 lit of milk, 0.5 to 1 lit of ghee, 2 kg palm Jaggery or 2lit of sugarcane juice, tender coconut water 2 lit and 12 Banana and 2 lit of palmyrah or coconut toddy (if available) and keep it for another 7 days (**21 days**).
- On **22nd** day Panchakavya is ready. It can be used up to 6 months. The solution should be stirred up daily.

AUVUTTAM

It is also a panchakavya preparation wherein the raw materials used for its preparation are derived from goat viz., goat dung, goat urine, goat milk, goat ghee and goat curd The other materials used are similar to the materials used in panchakavya prepared from cow's products.

Cost details

Sl	Particulars	Quantity	Cost (Rs)
Key Ingredients for preparation of 20 – 25 liters of Panchakavya			
1	Cow dung	5 Kg	-
2	Cow urine	5 Lit	-
3	Water	5 lits	-
4	15days fermented Cow curd	2 Lit	**30.00**
5	Cow milk	2 Lit	**30.00**
6	Cow Ghee	0.5 Lit	**100.00**
Complementary Ingredients			
7	Palm Jaggery /sugarcane juice	2 Kg/2 lits	**30.00**
8	Tender coconut water	2 lits.	**15.00**
9	Fully ripened poovan or other varieties of banana	12 Nos	**10.00**
10	Mud pot or Plastic drum	1 No.	**100.00**
11	Toddy (based on availability)	2 lit	-
	Total		**315.00**

" Panchakavya can either be sprayed (foliar application-2-3%) or else mixed with irrigation water (fertigation)"

Whom to contact

- MYRADA KVK
- State Agricultural Universities
- Department of Agriculture and Horticulture

Component - 5

CROP PEST REPELLANT

Definition

Pest repellent is the botanical extract that prevents insect damage to plants by rendering them unattractive, unpalatable or offensive. Crop pest repellant refers to fermented plant extract which ward off insects inorder to prevent insect damage and loss to the crop.

Rationale

Pest management is one of the mandatory practices in any crop cultivation as occurrence of pests is inevitable and natural phenomenon. The enormous and indiscriminate usage of chemical pesticides in pest management has led to soil degradation and environmental pollution. Pest repellant is one of the important components of IFD which is something natural, wherein the botanical extract preparation from few plants is used to repel insects from their host plants in order to prevent damage to the plants.

Purpose served

- Minimizes external input (pesticide) costs.
- This is an eco-friendly approach in pest management wherein the pests are not destroyed but made to leave the plant, thereby conserving biodiversity.
- Affordable, locally accessible (around the farm), and cost-effective
- Effective utilization of weeds (which are not fed by cattle) and cattle resources

Preparation Method

- **Type I:** Selection of five to six weed plants or plants not preferred by grazing animals should be done. Two kilogram plant material of each selected plant to be chopped or ground and soaked in one part of cow dung and four parts of cattle urine. Keep it for 5-7 days for fermentation, filter it and the filtrate to be diluted in water ***(1: 10)*** and sprayed.
- **Type II:** If the leaf extract is needed for immediate spray, the plant materials collected can be put together along with water in a vessel and boiled till the solution becomes concentrated (2/3 of original solution) and add 1 Kg turmeric powder. Then the solution is to be filtered, diluted with water and used for immediate spray.

The pest repellant can be used only as prophylactic measure. Once the intensity of pest and disease increases, alternate control measures have to be taken. Care has to be taken in preservation of the extract as fungal infection and worms develop if not stirred properly during fermentation process.

* *This botanical extract has Pest repellant and growth promoter characteristics which lasts for 7-10 days. After that it acts as a good growth promoter. So it is always advisable to prepare fresh extract and use it then and there.*
* *Adding the solution of previous preparation in fresh preparation of the extract enhances rapid fermentation.*

What all could be used...

Azhadiracta indica, Carica papaya, Jatropha curcas , Parthenium hysterophorus, Calotropis gigantia, Annona squamosa , Datura sp, Leucas aspera, Pongamia pinnata, Aloe vera sp, Ipomoea sp, Ocimum sp, Adatoda vasica , Lawsonia innermis, Lantana camera, Vitex negundo, Allium sativum etc.

Azhadiracta indica (Neem)

Calotropis gigantia (Milk Weed)

Pongamia pinnata (Pungam)

The use of repellants to ward off insects has been a very old practice with mankind. The botanicals of plant products have been used as insect repellants in our country from ancient times. Neem leaves, Calatropis, turmeric and sandal dhoop are used in insect control from time immemorial.

Selection Criteria of Crops

- Locally available weeds
- Non-preferred plants of grazing animals
- Plant factors- Disagreeable odour and bitterness
- Latex producing plants

Mode of Action....

- The pest repellant is classified as chemical repellant wherein the plant extracts present in pest repellant have strong pungent odour and certain chemicals (terpenes, quinines, phenols etc) that repel insects. Thus insect damage to plants is prevented by rendering them unattractive and unpalatable.
- The pest repellant spray should be given at 15-20 days interval during the crop period as prophylactic measure The crops selected for preparation of this extract has to be changed during each preparation as the insects will develop resistance easily, if same combination of crops is used every time.

Cost of Preperation

The expenditure incurred in preparation of this extract is negligible as all the raw materials required for its preparation are easily and locally available in the farm. As possession of cattle is mandatory in **Integrated Farm development (IFD)**, availability of cattle resources becomes easy. Initial cost may incur if we are procuring plastic drum of 25 litres which cost Rs.300.

Ms. Padmavathi, aged 25 is a progressive young women farmer of Adireddiyur village. The crops like groundnut, maize, tapioca, cotton, sesame are being cultivated in her farm. In every rabi season Groundnut was cultivated, wherein leaf folder and sucking pest were regularly occurring.

In order to manage these pests, she tried using all sorts of chemical insecticides. Though the pests were controlled initially, in due course of time, it aggravated the problem of sucking pest (Resurgence). She took nearly 3-4 chemical sprays in groundnut incurring an expenditure of Rs.1000 to combat the pest problem. It was at this time MYRADA-KVK intervened into the village (2005) and identified her one of the IFD implementer and beneficiary. Now, she has resorted to non pesticidal management wherein bio pest repellant spray which was prepared using the locally available weed plants. There was no expenditure incurred in its preparation. Padmavathi, for the past three years never prefers chemical insecticide and uses pest repellant with alternate sprays of panchakavya, Jeevamirtham and neem extract to manage any pest menace in her field. She saved Rs.1000/ crop/ season for plant protection activities after resorting to this botanical insecticidal spray. She finds a healthier crop and an eco-friendly environment in the place where she lives.

Whom to contact

- MYRADA KVK

GREEN FODDER

Definition

The term green fodder or forage crops denote plants either cultivated or wild that are used as feed for domestic animals, which are allowed to graze or fed with cut grasses in stalls. Green fodder is playing a major role in ensuring the increase in milk production and improves animal health and reproduction in an affordable and accessible way.

Rationale

Due to the aberrant weather condition feeds are not available throughout the year for cattle, which ultimately leads to imbalanced nutrient feed for cattle. The use of concentrates no doubt will give the greatest animal production per unit feed intake, but this may not be economical in countries like India where grains and concentrates are costly and/or in short supply. In situation like this, Green fodders have cooling effect on the animal body, more palatable contain easily digestible nutrients, provide fresh effectively utilizable nutrients in natural form and slightly laxative.

Purpose served

- Green fodders fulfills the nutrient requirement of the cattle
- It helps in the production and reproduction of the animals
- The green fodder availability is ensured throughout the year

"Animals yielding as high as 8 litres of milk can easily be maintained solely on green fodder without any concentrate".

Learn about more varieties of fodder:

Characters	Varieties			
	CO3	COFS 29	CO 27	K10
Green fodder yield (t/ha)	400	160-170	44.4	15
Protein content (%)	10.5	8.41	7.93	9.2
Dry matter (%)	17.08	23.6	24.17	-

Cost

The cost of slips accounts to Rs.300 which can be planted in 10 cent area which yields 16 tons of green fodder in a year. Two cows can be fed with this available green fodder.

AZOLLA- AS SUBSTITUTE FEED

Azolla is a substitute feed for livestock which is rich in protein (25- 35%). Livestock can easily digest azolla due to its high protein and low lignin content.

Advantages

- It increases the quality and quantity of milk production (15 to 20 %), 10% increase in milk fat, 3% increase in solids not fat (SNF)
- Commercial feed especially oil cake could also be reduced to 15- 20 percent by supplementing half the quantity of azolla (Recommended Dose for respective animals). Fresh Azolla thus collected can be mixed with commercial feed in the ratio 1:1 or given directly to livestock.
- Improves the health and longevity of animals.

Feeding pattern for livestock and poultry

Sl	Animals	Quantity/day
1	Cattle	1.5- 2 kg
2	Sheep & Goat	200- 300 gm
3	Pig	1.5-2 kg
4	Backyard poultry	20-40 gm
5	Turkey	30- 50 gm

Source: TNAU, Coimbatore

Cultivation Methods

Tank method

- Construct the tank of one square meter with depth of one foot.
- 15 kg of soil is uniformly spread up to the level of 0.75 feet
- 20 kg of cow dung is mixed with water
- Sufficient water is added to make up the water level at about 0.25 feet
- About 0.5 kg of Azolla is uniformly spread over the bed
- After 2 weeks, 1 kg of azolla can be harvested daily

A. Tank method: Size: 2.1x1.5m

S. No	Component/ Material	Quantity	Unit cost(Rs)	Total (Rs)
1	Bricks	135 Nos	2.70	364.50
2	Cement	2 bags	260.00	520.00
3	Sand	60 kg	4.50	270.00
4	0.75'' Jelly (Small Hard Broken Stone)	25 kg	15.00	375.00
5	Labour	-	400.00	400.00
	Total			**1,929.50**

Silpauline lined pit method

- Soil surface is cleared off weeds and leveled. Bricks with a breadth of 10 cm is lined horizontally
- Silpauline sheet of 2.5 x 1.8 metre size with 150 GSM thicknesses is uniformly spread over the bricks, so as the margin of the rectangle made out by bricks.
- Silpauline lined water proof pit of 2.10x1.5 mt with a depth of 10 cm is ready about 15 kg of soil is uniformly spread over the silpauline pit, which will provide the primary nutrient base for azolla plant.

"About 2 kg of soil in the azolla bed is almost equal to about 1 kg of commercial NPK fertilizer after six months"

- About 3.5- 4 kg of two day old cow dung is made in to a slurry after mixing at in 10 -12 litres of water
- Sufficient water is added to make the water level at about 7- 10 cm about 1-1.5 kg of pure mother culture of Azolla seed material is spread uniformly over the bed. Fresh water is sprinkled over the azolla immediately after inoculation to make the azolla plant erect.
- Azolla will spread over the bed and will become a thick mat with in seven days. The initial one kg will become 8- 10 kg with in a span of seven days and 1- 1.5 kg depending on the growth can be harvested on the 7 th day and each and every day there after.

B. Silpauline line method: Size: 2.1x1.5 m

S. No	Material	Quantity	Unit cost (Rs)	Total (Rs)
1	Silpauline sheet	1 No.	250.00	250.00
2	Bricks	27 Nos	2.70	72.90
3	Labour	-	-	50.00
Total				**372.90**

GREEN FODDER

Mr. Gurumoorthy is living in Esaparai village of Anthiyur block, having 2 cows. He says that after Kendra intervention, green fodder availability (CO3 & COFS 29) in their 30 cents of plot, they are harvesting 30 kg of green fodder daily for their two cows. In a harvested plot they can again harvest in a span of 30-40 days. So they are able to get green fodder round the year.

ON BUND PLANTATION

In hill areas, nearly 1000 ha on bund fodder plantation was done by our KVK. This attempt made available enough fodder to the livestock. This also contributed prevention of soil erosion.

AZOLLA

Mr. Mahesh from Attugulipura village expressed that, he feeds azolla for past one year to his cow. Initially the cattle refused to consume then he used the strategy of mixing Azolla with other feeds .Then gradually after two months, azolla was given as regular feed. His observation on milk yield was found encouraging. He said that while normal feeding, the cow used to give 5.5 litres of milk per day but when azolla feed was given as supplementary feed since last 10 months, the yield increase identified was about 250-400 ml of milk.

Whom to Contact :

- State Agricultural University
- State Vetenary University
- Myrada KVK

KITCHEN GARDEN

Component - 7

Definition

A home garden or kitchen garden refers to raising the vegetables to meet the daily requirement of the vitamins and minerals to supply the food essential for protection and body building

Rationale

The main aim of the kitchen garden is to maximize the output and continuous supply of vegetables through out the year, which enables the family to utilize the available space and home made organic wastes effectively for their own needs.

Purpose served

- ❖ Easy access to fresh vegetables throughout the year
- ❖ Helps to avoid nutritional deficiencies
- ❖ Cost-economic

Principles of kitchen garden

The main aim of kitchen garden is maximizing output and a continuous supply of vegetables through out the year. By following the principles given below in the lay out of a kitchen garden, the objective can easily be fulfilled:

- The perennial plants should be located on one side of the garden, usually on the rear end of the garden so that there may not be shade effect on other crops and competition for nutrition with other vegetable crops.
- Adjacent to the foot path all around the garden and the central foot path may be utilized for growing different short duration green vegetables, coriander, fenugreek, Ceylon spinach ,Mint, Amaranthus and green leaves. Each type of this green can be grown along each side of the foot path and these crops can be rotated in different seasons.
- The fence or trellis around the home garden may be utilized for growing light creepers like ridge guard, bottle guard and bitter gourd. These may also be rotated in different seasons
- The compost pits are placed in two corners of the garden. They are meant for garden and kitchen waste. Pandals (Temporary roof like structures with locally available sticks) may be erected over the compost pits and trained with the creeper vegetables like lablab, ribbed gourd and snake gourd. This will hide the compost pits from view.
- Pandals may also be erected over the central foot path.

- Both sides of the central foot path may be utilized to train tomato plants on single stemmed with the support of stakes.
- The bunds separating the beds may be used for growing root crops or onion.
- The conveniently divided small plots may be utilized as much as possible.

Cost details for one cent Nursery (one year)

Sl	Particulars	Amount
1	Seeds (locally available)	250.00
2	Labour cost	Family members
3	Purchase of Agri inputs	300.00
	Total	**550.00**

KITCHEN GARDEN WITH DRIP IRRIGATION

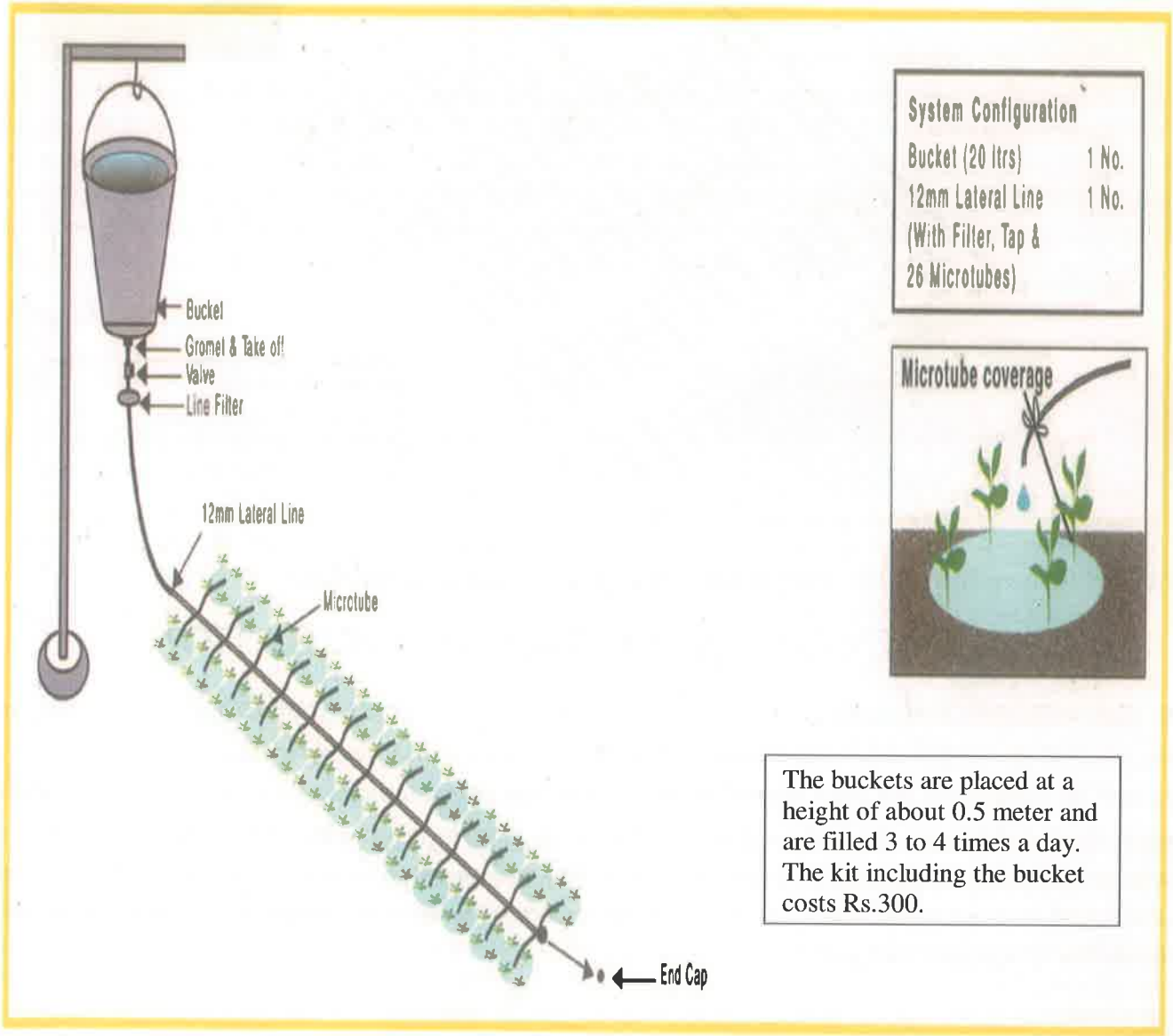
The watering in the kitchen garden is a crucial in the village and there is a need to reduce the drudgery among women. Drip irrigation is the solution for this problem

BUCKET KIT

The bucket kit is ideally suitable for kitchen gardens which are maintained by women or landless farmers and urban gardens. It consists of a bucket a 10 metre long lateral fitted with 26 micro tubes. It can irrigate 104 plants, placed around these micro tubes

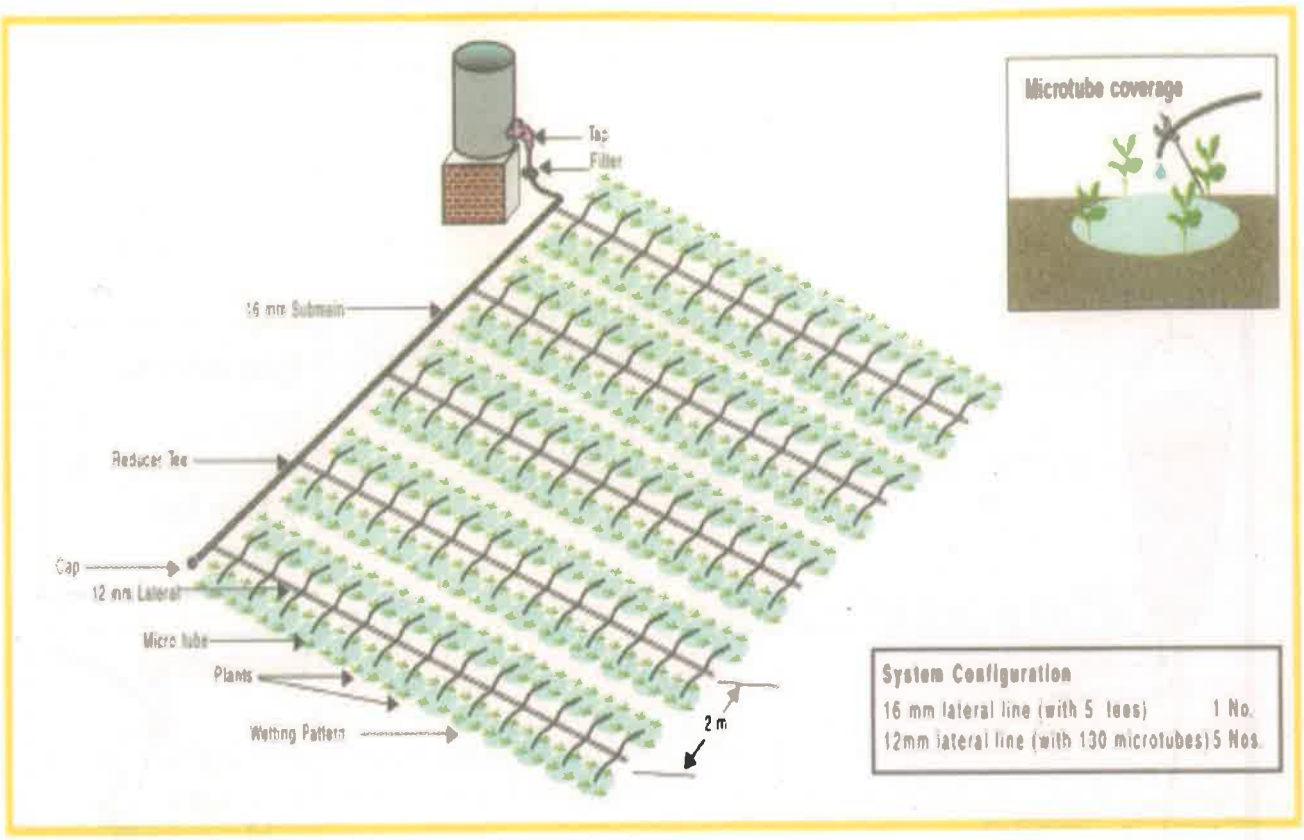
DRUM KIT

The Drum kit is most useful for kitchen gardens and small commercial vegetables gardens. It can irrigate 520 vegetable plants with just one drum of 200-litre capacity of water. The drum must be filled once in morning and evening. The drum kit consists of 130 tiny 1 mm-diameter pipes called micro tubes, fitted to 5 rows of 12mm-diameter pipes called laterals. These laterals are connected to a drum of water by a 16mm-diameter pipe called sub-main. All the pipes are pre-fitted and packed in a small box. The farmer has to just unroll all the pipes, lay them on the ground and connect to the drum. A small manual is provided to pictorially guide the farmer on correct installation and planting. Water from the drum flows out like a small stream from the micro tubes. Water spreads out in a circular pattern of about 0.5-meter radius. Four plants are planted in each of the circles.



Source: International Development Enterprises (IDE), Bangalore

DRUM KIT SYSTEM



Source: International Development Enterprises (IDE), Bangalore

KITCHEN GARDEN WITH DRIP IRRIGATION

Ms. Gurunanjamma who is living in M.P.Doddi village of Talavadi is a beneficiary of IFD and she is utilizing the farm resources effectively to reduce the input cost. Before the IFD intervention, she has to travel 5 Kms to Talavadi to buy even the curry leaves and other vegetables. She expressed that after establishing the kitchen garden with bucket system she started growing vegetables and perennial trees and now she is using the vegetables and greens for the family daily. She told that by using the bucket system watering problem has been reduced and it also reduced the time and drudgery in growing vegetables. She expressed that now their family is consuming the balanced diet with the consumption of vegetables and greens.

Whom to contact

- State agriculture and horticulture departments
- State agriculture university
- MYRADA KVK
- Private drip agencies

GRAIN STORAGE

Definition

Grain storage is the storage of food grains in order to minimize the storage losses and to maintain its original quality.

Rationale

Protecting food grains has assumed greater importance as post-harvest grain loss has reached great heights. In this way the loss of grains is estimated to be around 10%. Out of which losses incurred during storage are estimated at 6.6 %. Among rural farmers, storage of grains at home level is a challenging task, due to the damages caused by insects, rodents, microbial contamination, environmental factors and improper handling practices. These factors cause both qualitative and quantitative loss to grains. Hence proper storage structures at household are essential to ensure the quality seeds and food grains.

Purpose served

1. Grains protected from biotic and abiotic stress.
2. Shelf life and quality of the grains improved
3. Preservation of traditional and improved varieties
4. Ensures food security at the household level

Grain storage structures (At household level)

PUCCA KOTHI

The improved storage structure is an indoor design constructed of burnt bricks in two compartments of 1 M.T. capacity each with R.B floor at the bottom and roof at the top. The inlet opening is provided in the roof at the top and the outlets are provided at the bottom. It has adequate facility for locking. The moisture barrier is provided in the construction to make it water proof. As such these improved structures can be used to their full capacity and found to be sufficiently moisture proof and airtight. Depending upon the space available, the structure can be extended further to have more compartments. Such structures with compartments facilitate the storage of different varieties of food grains.

Mr. Chickkunshetty in M.P.Doddi village in Talavadi block has a Puccakothi of 1500 kg capacity. She told that after attending the training program on post harvest technology conducted by MKVK in association with save grain campaign, her family could save the harvested food grains to its fullest value. She says "Now our family is consuming quality food grains and there is no loss or damage to the food grains stored"

INDOOR BINS (METAL BINS):

- These bins are fabricated using either 24 gauge or 22 gauge G.P sheets of different standard sizes available in the market, the capacities of which range from 2.75 to 3.0 quintals.
- These are indoor bins and may be kept in a room or verandah under a roof. In this design different capacity bins have been developed for storage of food grains required for domestic consumption and also for storage of seed grains and pulses. The locking facility has been provided in all types of domestic bins.
- The inlets are provided at the top and different types of outlets are provided at the bottom of the bins to facilitate unloading different commodities of food grains like finger millet, wheat, paddy and maize conveniently.

"Mrs. Nanjamani, wife of Mr. Jadeswamy living in M.P.Doddi village of Talavadi block has the Metal Bin of 200 kg capacity. Finger Millet is the staple food in the region. She expressed that before resorting to metal bin the harvested finger millet were damaged by rodents, insects and by fungus due to humidity in the stored grains. But now she is happy that the food grains were saved from damage after harvest and they are able to consume the quality product".

Cost details

- The capacity of pucca kothi varies ranging from 1000kg – 2000kg according to its size and the cost of pucca kothi ranges from Rs.3000-5000.

- The Metal Bin has the capacity of 150-200kg. The cost of metal bin ranges from Rs.950-1300

Whom to contact

Ministry of food & Civil supplies -"Save Grain Campaign"

State Agricultural Universities

Component - 9

ECOLOGICAL SANITATION

Definition

Eco san is an alternative approach to safe and efficient management of human excreta and urine. Ecological sanitation referred as "Eco-san", is a sanitation method that works on the principle of " closing the loop" i.e. human waste is a resource and rather than being disposed, should be treated, recovered and reused.

Rationale

Ecosan is a holistic concept to save water, prevent contamination and pollution of water, and return the nutrients in human excreta back to the soil. The major global challenge faced by sanitation sector is billions of people do not have toilets. Open defecation and poorly maintained toilet models affect health of poor, and leads to water and environment pollution. In ecosan, urine and feces are separated at source and not mixed with water. The separated urine can be applied as fertilizer after treatment and feces can be composted. Ecological sanitation recycles human excreta safely and productively to improve soils. It minimizes water consumption in sanitation. It protects water resources and the environment from sewage pollution thereby offering very comprehensive public health protection.

Purpose served

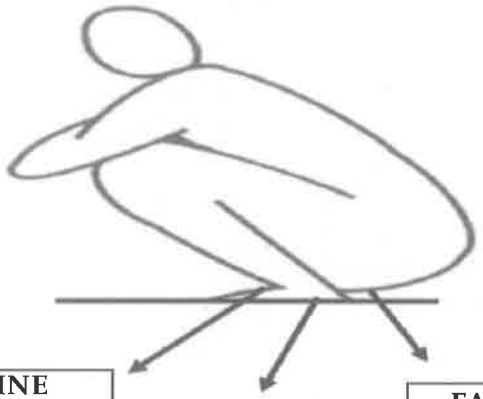
- One of the way of solid waste management practice
- Safe recycling of human waste for effective utilization of resources for field application in order to improve the soil productivity
- Minimizes water consumption
- Protects water resources and the environment from sewage pollution
- Offering very comprehensive public health protection

Faeces: Disease Spreading

Faeces is however dangerous. It contains pathogens, which cause several diseases. It is safer and easier to destroy the germs in sanitized faeces. We should isolate the faeces which are in a small volume and help it to dehydrate itself than flush them with water and dispose them. We produce 150-200gms of faeces per day and 80% of it is water and reminder is mostly organic matter. When dehydrated faeces take up very little space and the pathogens are destroyed. It is criminal hence to flush the faeces and along with them the pathogens into a large quantity of water, which will contaminate water, soil and air.

Concept of Eco-San

In the conventional approach to sanitation, faeces and urine are excreted from the body are allowed to mix together in water. In most ecological sanitation systems, urine and faeces are diverted at source and processed separately. Human excreta is safely collected within the ecological toilet, without odour, and transformed into a safe unobjectionable soil improver. In this process all the pathogens in the faeces are destroyed. All that is required is the removal of faeces only once a year or so. This removal is not an objectionable task at all as the product bears absolutely no resemblance to its origin in appearance, colour or odour.



URINE

Urine becomes harmless water + useful soil nutrients

WASH WATER
Percolated into ground safely

FAECES

Dehydrated faeces forms compost which can be used for soil enrichment

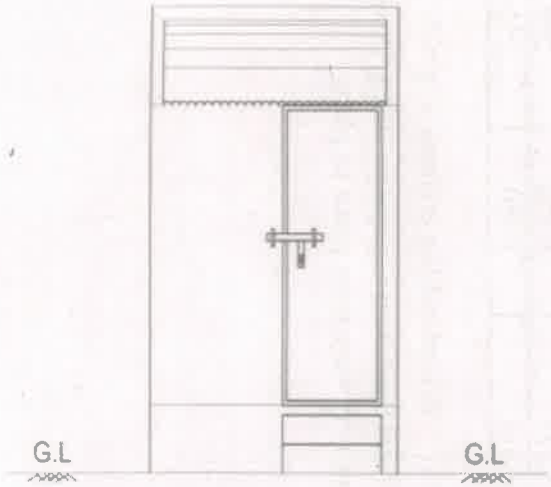
Estimation for construction of Ecological sanitation Toilet

Sl	Particulars	Expenditure details (Rs)			Total cost
		Construction Material	Labour charge	Unforeseen item	
1	Construction with hollow block	5,572	1,150	250	6,972.00
2	Construction with bricks & tiles	8,717	1,550	250	10,517.00

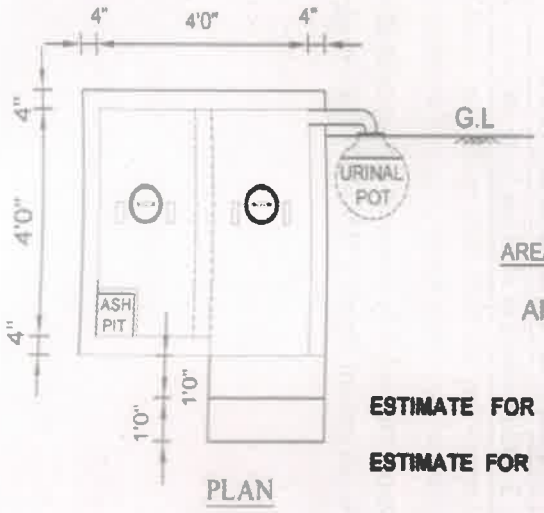
Note: The subsidy amount can be mobilized from Total Sanitation Campaign (TSC), District Rural Development Agency (DRDA). The construction cost may vary from place to place

CONSTRUCTION OF ECO - SAN TOILET

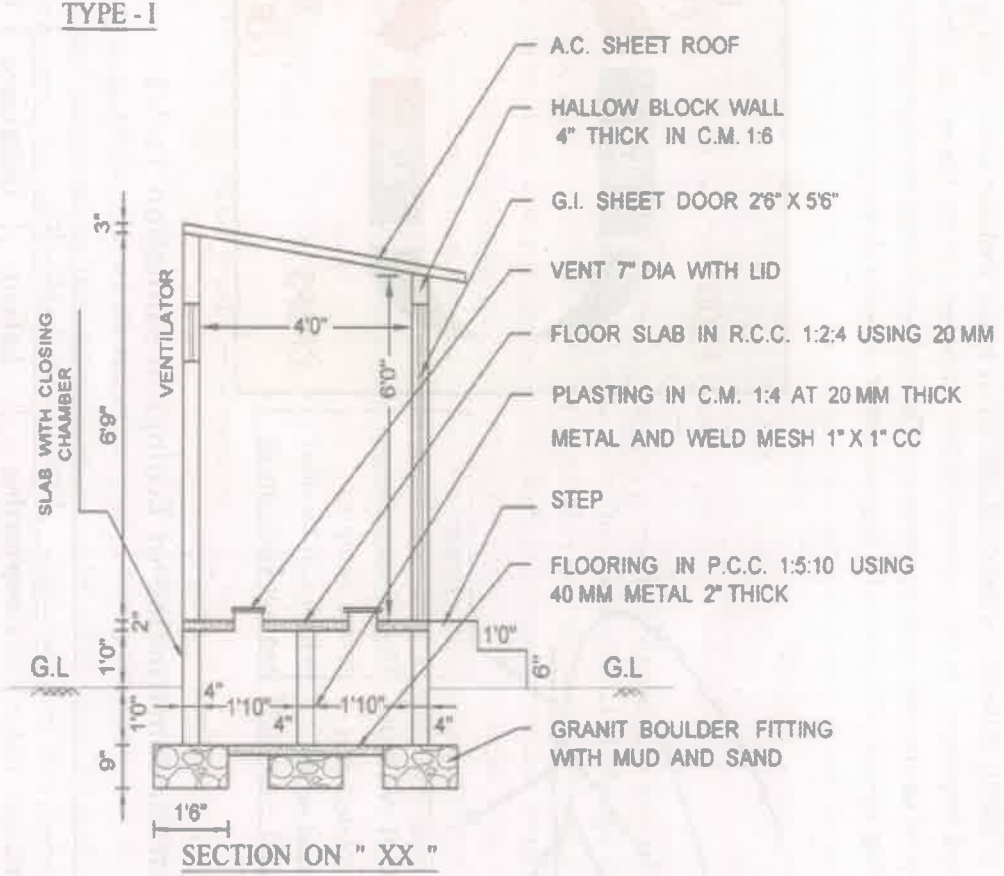
TYPE - I



ELEVATION



PLAN



SECTION ON " XX "

AREA DETAILS

AREA OF ECO - SAN :- 21.81 SQ .FEET

ESTIMATE FOR CONSTRUCTION OF HOLLOW BLOCK IN HILL AREA : Rs. 6027.00

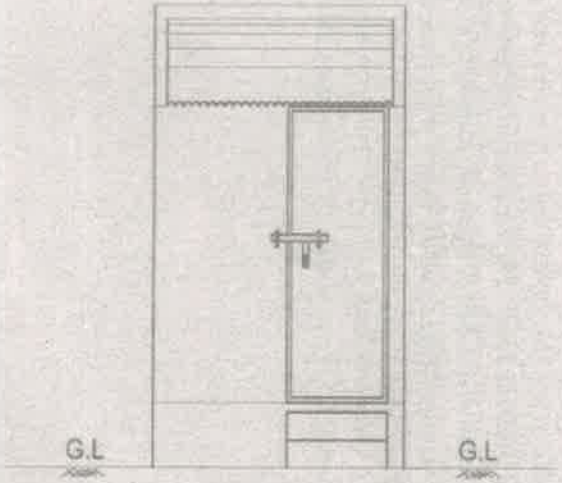
ESTIMATE FOR CONSTRUCTION OF HOLLOW BLOCK IN PLAIN AREA : Rs. 7022.00

PREPARED BY

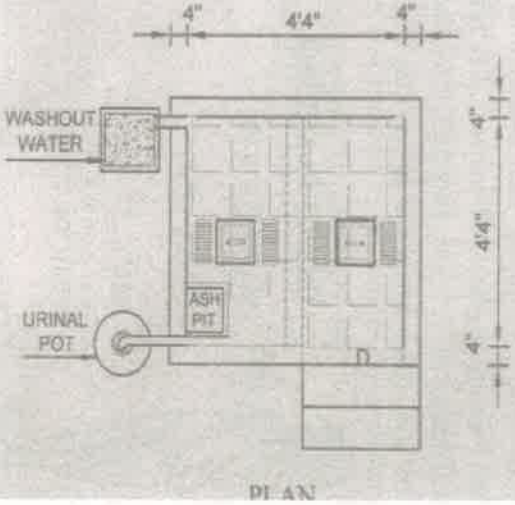
D. JOHN PRABAKARAN
AGRICULTURAL ENGINEER
MYRADA KVK . GOBI

CONSTRUCTION OF ECO - SAN TOILET

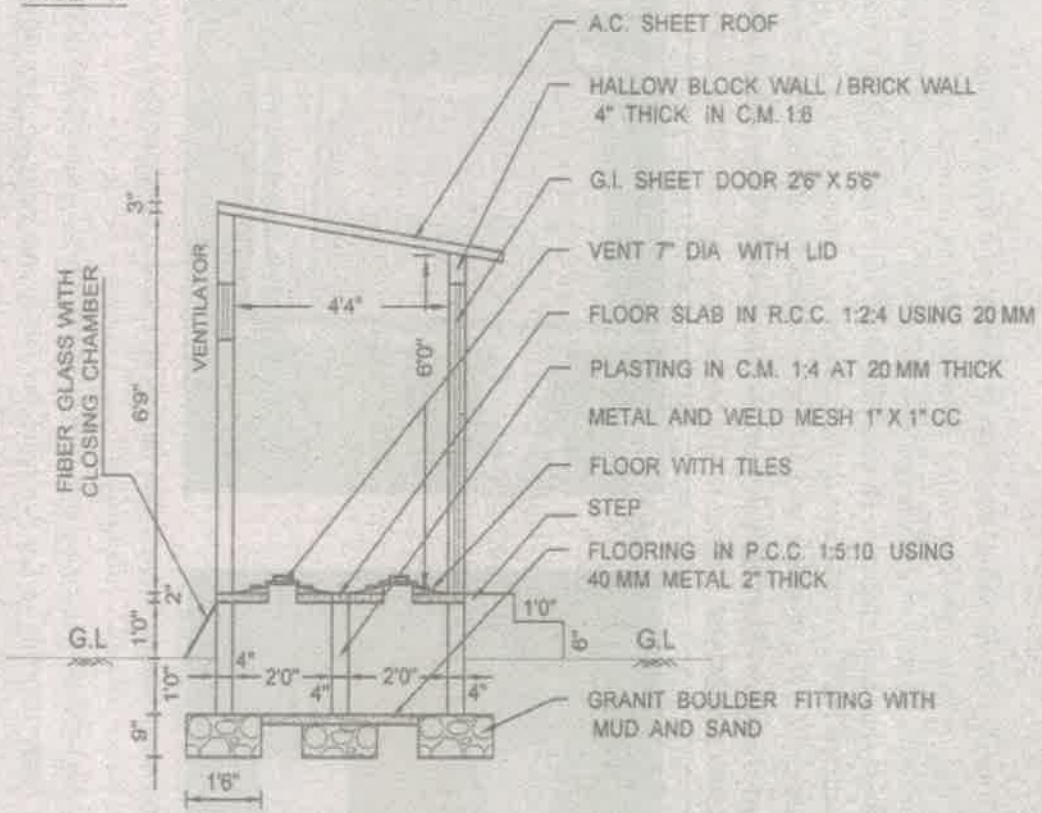
TYPE - II



ELEVATION



PLAN



SECTION ON " XX "

AREA DETAILS

AREA OF ECO - SAN :- 25.00 SQ.FEET

ESTIMATE FOR CONSTRUCTION OF BRICK WORK : Rs. 10,517.00

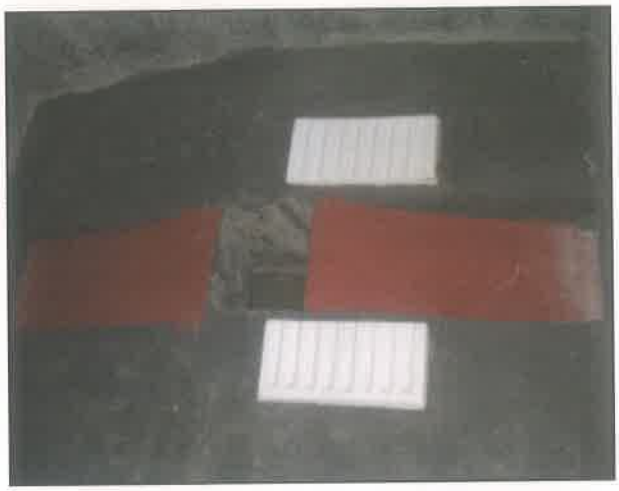
PREPARED BY,

D. JOHN PRABAKARAN
AGRICULTURAL ENGINEER
MYRADA KVK GOBI

Do you know?

Urine: Safe Product

Urine is a sterile liquid, which could be used as a liquid fertilizer. In fact many tribes in India have been using urine for farming for ages. It contains precious nitrogen, potassium and phosphorous so critical for farming. Urine has pungent smell and when stagnates, emits a foul smell. But when properly managed it will have no smell. Farm scientists in India have estimated that if only the urine of about 30 crores of people who are having toilets (mostly in urban areas) could be collected it could produce 1.65 million tones of fertilizers valued about Rs. 800 crores per annum.



"Ecological sanitation is an approach that no longer treats human excreta as a waste product to be hidden or disposed of"

Mrs. Rajamma and her family adopted Ecosan technology since 2004. Her family members consist of three adults and two Children. Rajamma told that before resorting to Eco San toilet, her family was going for open defecation. During rainy season, they used to defecate in front of their house. She said that now they are defecating at compost toilet which is easy to use and clean. When her pregnant daughter came home for delivery, she felt comfort and safe to go for defecation. Even her grandson (Three years old) was able to use this type of toilet. She also said that, even though very little water was utilized, there emanated no bad odour from the toilet. The recycled urine was utilized as bio- fertilizer for growing vegetables, Banana, Curry leaves and Lemon trees. Mr. Veeranna, Rajamma's husband said that after harvesting the compost, they used it for their field as manure (finger millet). Apart from their own consumption, they are also selling lemon and are earning Rs.500 to 700 per year.

Whom to contact

MYRADA KVK

DRDA -TSC

BDO

UNICEF

Component - 10

ON BUND BIOMASS

Definition

"Biomass or on bund biomass is the quantity or weight of living material that exists in a particular area, including leaf matter, fuel and fodder".

Rationale

In recent scenario high deforestation rate and reduced evergreen tree cultivation on farm boundaries leads to surface runoff which ultimately results in fertility loss and yield reduction. On the other hand, rural poor have to depend almost entirely on forests and common land for their fuel wood and fodder supplies. With growing deforestation and the consequent diminishing supply of wood-based fuel, the population is facing a severe shortage.

Biomass cultivation found to be effective binding the soil particles and to prevent soil erosion. It also helps to reduce the velocity of the rain water and allows it to infiltrate effectively. Further biomass can produce inland green leaf manure for compost production or mulching purpose.

Purpose served

- Soil and water conservation
- Soil fertility improvement
- Bund strengthening and stabilizing
- Inland green leaf manure
- Fuel wood supply and Drudgery reduction
- Promotes afforestation
- Reduces the wind velocity

"The seedlings/saplings for on bund plantation could be raised at the farm level which brings down transport cost and also generates employment for farmers. Further the locally raised saplings will be easily acclimatized to the climate".

To further supplement the availability of limited quantities of organic manures, one can also incorporate the green lopping brought from surrounding plants/trees in and around the farm. This practice is called green leaf manuring. It will be a good practice to establish plants like *Cassia seamia*, Glyricidia, Pongamia on the field bunds so that the loppings from these plants can be used for green leaf manuring. Fully grown tree (tree having good canopy) are cut down and the leafy material are transported to pit, where the composting takes place. After decomposition the litter can be utilized as organic manure. Branches are used for fire wood purpose.

"The plants grown along the bunds with 5ft spacing, must regularly be pruned at5 ft height or the lopping must be collected frequently to avoid shade effect on main crop which is grown inside the field"

Cost Details

On bund plantation requires around 275 seedlings per acre (*Cassia seamia*), which cost around Rs. 550 and labour cost for pitting and planting needs Rs. 275

Mr.Mathavappa, aged 52 from Annakarai village of kadambur hills is growing crops like ragi, maize, vegetables, tapioca. The farmer was facing problems like soil erosion, nutrient run off and consequent low water holding capacity of the soil. He found hard to bring a solution to this problem. It was at this time MYRADA-KVK emphasized on bund biomass plantation to solve the problem. Therefore the bund of his ragi field was planted with Cassia seamia and the loppings were collected after three years and incorporated in the soil to enhance the soil productivity. The physical and biological properties of the soil namely porosity, texture, structure, colour, pore space, available nutrients, increased water holding capacity, increased flora and fauna population.

Whom to contact

MYRADA KVK

"MYRADA KVK has been working for past ten years in watershed area to promote the bund plantation using *Cassia seamia* and *Glyricidia spp*. Approximately 20, 00000 trees have been planted in the watershed area".

RAIN WATER HARVESTING

Definition

Rain Water Harvesting is a way to capture the rain water when it rains, store that water above ground or charge the underground and use it later.

Rationale

In the present world scenario increasing water scarcity is a challenging task for many countries. There are many ways in which the water can be saved, stored and utilized properly. Traditionally pond and lake are considered to be effective water source not only for irrigation purpose but also cattle and drinking purpose. The traditional wisdom of rain water harvesting has been forgotten for some time due to the onset of bore well culture. Now due to scarcity in water resources coupled with increasing water demands, rain water harvesting is a crucial and needful for human survival.

Purpose served

- Ground water recharge
- Drinking water purpose
- Essential Domestic purpose

Health Benefits: *In many parts of the country the ground water contains high amount of dissolved solids like fluorides which are detrimental to health. Rain Water Harvesting could emerge as a sustainable alternative.*

Rain Water Harvesting Methods (Five Water Strategy)

- **Roof Water Collection:** Roof rain water can be collected through pipes and routed to the tanks which are constructed either above or below the ground level. The collected water can be used for household purpose, kitchen garden and as drinking water, if properly stored.

- **Surface Water Management:** this includes construction of soak-pits near bore/open wells to trap surface water flow which percolates into the wells.

- **Reduction of Evaporation:** from the top one foot of soil by providing vegetative cover, especially during dry fallow season; we have experimented with inter-cropping of perennial castor sowed during the Kharif, which provides shade till March/April, or pure castor/lab-lab crop sowed during late rains in November/ December.

- **Sub Soil Management: A Watershed Approach**

  Apart from this, MYRADA KVK has been involved in watershed development activities for more than two decades in different parts of the District, in order to conserve water and soil for sustainable agriculture. Various structures like earthen bund, check dam, surplus wear, gully check, pond with feeding channel etc. are used as commonly erected structures at watershed areas to *make water to walk* for ground water recharging and also to ensure the maximum availability of water throughout the year.

Check Dam

Village Pond

- **Flood Irrigation water Management**

  This is mainly focused in flood prone areas

Rain water harvesting – Recharge structure for open well

Feed back received from Kuchikullur village on rain water harvesting. Kuchikullur is located from Anthiyur with a distance of 7 KM. our village is in dry condition and with scarcity of water. We are facing difficult situation to meet our water consumption. During summer, we used to walk for 2,3 KM to fetch water for drinking and other purpose. The SHGs in this village approached MYRADA KVK to establish rain water harvesting structure to store the rain water. So Kendra with community participation constructed a rain water harvesting structure 2001-02 to benefit 13 families.

The rain water is collected from households through a small water tank in each house and passed into drainage and stored in the storage pit. The collected water is recharged the nearby well. The feed back from the beneficiary are observed as follows;

- *The rain water harvesting is useful to us to collect the water during the rainy season and to use during the dry season.*
- *The collection of water is useful to recharge the common well in the villages*
- *The well is used to drinking purpose otherwise the people have to walk to nearby agri fields, where water is available*
- *The water is used for domestic purpose, like bathing, washing cloths and vessels*
- *The water is used to irrigate the kitchen garden in each house and we are consuming the fresh vegetables and greens with some perennials like Curry leaves, papaya. Drum stick, Coconut tree.*
- *The collected rain water is saved and we are having now enough water throughout the year in the well. They also said that the structure has not been established, we must face drinking water problem in our village.*

Roof Water Harvesting at community level

Mavallam was one of the small remote village located in the midst of thick forests of Dhimbam Hills. About 50- 60 households are over there with the main occupation of agriculture & allied activities. The farmers are marginal, owning small piece of Drylands around 1 – 3 acres.

The Mavallam village receives an rainfall of about 900mm even then the water needs of the households are not met out. The Village has a small seasonal stream in a distance of 2kms where they can avail some water which was bounded with the disturbances of wild animals. Panchayat water tap was also available through which each family avails 2- 3 pots of water per day (which was insufficient) that too in the summer season the water availability is 50% compared with the normal times. The villagers approached through all the sources to met out their water problem but even no initiative taken so far. The SHG members in the Mavallam village discussed their problems in their respective groups and taken forward the same to Federation to have the solution. The federation discussed & analyzed their need & requested MYRADA to help in some way.

MYRADA made a feasibility study and discussed with the SHGs about the scope of Roof Water Harvesting in March 2007. The SHGs in turn discussed the issue among the villagers and came out with a proposal for which the 6 SHGs in the village will contribute Rs.2,500.00 each. With the Cooperation & the interest of the villagers MYRADA KVK supported both Technically & Financially towards establishment of the Rainwater Harvesting structure. The Construction process ended in December 2007 & the community has started to use. The water harvested through the structures helping to an extent for the people in Mavallam to meet out their water needs.

Whom to contact

TWAD

DRDA

Agricultural engineering Department

MYRADA KVK

APPENDIX - 1

Abbreviation:

DRDA	-	District Rural Development Agency
EC	-	Electrical conductivity
ECO-SAN	-	Ecological Sanitation
FYM	-	Farm Yard Manure
IFD	-	Integrated Farm Development
ICAR	-	Indian Council of Agricultural Research
KVK	-	Krishi Vigyan Kendra
KVIC	-	Khadi Village Industries Commission
LEISA	-	Low External Input for Sustainable Agriculture
MYRADA	-	Mysore Resettlement And Development Agency
NGO	-	Non Governmental Organization
TNAU	-	TamilNadu Agricultural University
UNICEF	-	United Nation Children's Fund

APPENDIX - 2

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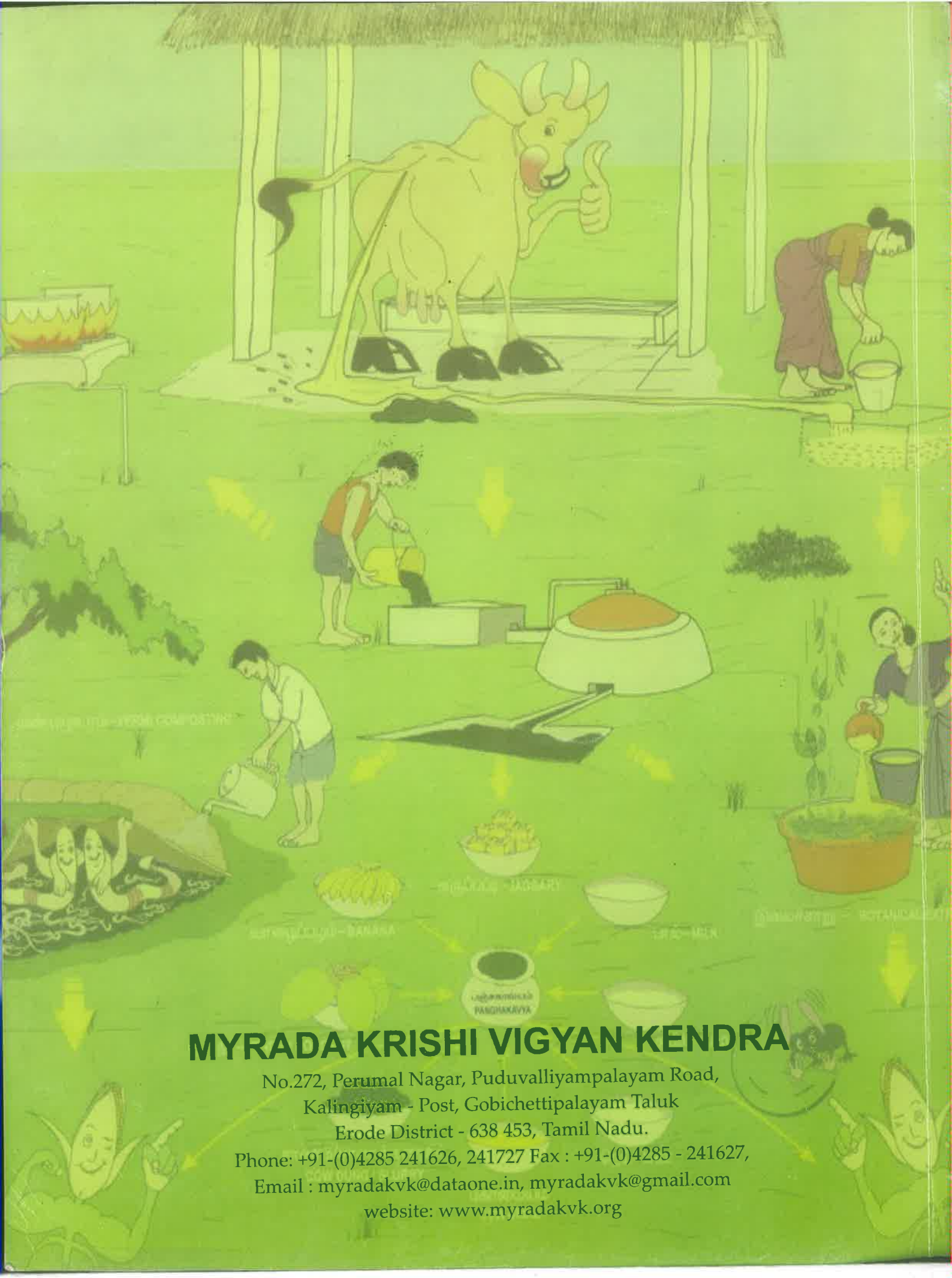

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