## CONSTRUCTION OF WATER HARVESTING FARM PONDS USING COIR GEO-TEXTILES:

### Importance of Water:

Water is an important natural resource and is the very basis of our life. We use water for drinking, irrigation, industry, transport and for the production of hydro-electricity. Water is a cyclic resource which can be used again and again after cleaning. The best way to conserve water is its judicious use.

A large quantity of water is used for irrigation and there is an urgent need for proper water management in irrigation sector. Over-irrigation through canals has led to water-logging in western Uttar Pradesh, Punjab, Haryana and Hirakud command area. Seepage along the canals can be checked by lining them. The overdraft by tube-wells has resulted in lowering of water table in a number of villages in Haryana, Punjab and western Uttar Pradesh.

In arid areas, wherever water has been brought for irrigation, saline and alkaline tracts have emerged, rendering the soil infertile. Wasteful use of water should be checked. Sprinkler irrigation and drip irrigation can play a crucial role in conserving scarce water resources in dry areas. Drip irrigation and sprinkles can save anywhere between 30 to 60 per cent of water.

Only 0.5 per cent—nearly half of this in Maharashtra—is under drip irrigation and 0. 7 per cent under sprinklers. There is large-scale pollution of water as a result of industrialization and urbanization. This trend has got to be checked.

Although one-eighth of India is declared as food prone, there are several thousand villages in India which do not have potable drinking water. The basins should be treated as one unit for planning water utilization. Dry farming should be practiced in dry areas. The experimentation under the National Watershed Development Programme for Rainfed Agriculture is being carried on since 1986-87.

There is a great demand of water in industries and the industrial sector offers great opportunities to conserve water. The economy in water-use in this sector will have two benefits. Firstly, the saved water may be used to meet the demand in other sectors. Secondly, the effluents thrown in the water bodies will be less.

Water in most industries is used for cooling purposes, thus, it is not necessary to use fresh potable water. Instead, the recycled water may be used for this purpose. By using the recycled water over and over again, fresh water can be conserved.

Demand of water for domestic use can also be reduced. For example, in most urban areas about 12.5 litres of water is used in one flushing. In some cities cisterns requiring only 5 to 7 litres of water in one flushing are now used.

Thus if each urban individual adopts smaller cisterns, the amount of water consumption for flushing can be reduced to half. Similarly, if raw water is used for cleaning, gardening, etc., a lot of fresh potable water can be saved. Water used in kitchen sink, wash basin and in bathroom can be collected into a tank and reused for flushing toilet and gardening also.

## Rain Water Harvesting:

Rain water harvesting is one of the most effective methods of water management and water conservation. It is the term used to indicate the collection and storage of rain water used for human, animals and plant needs. It involves collection and storage of rain water at surface or in sub-surface aquifer, before it is lost as surface run off. The augmented resource can be harvested in the time of need.

Artificial recharge to ground water is a process by which the ground water reservoir is augmented at a rate exceeding that under natural conditions of replenishment. The collected water is stored and pumped in a separate pipe distribution. This is a very useful method for a developing country like India in reducing the cost and the demand of treated water and also economizing the treatment plants operation, maintenance and distribution costs.

### Need:

i. To overcome the inadequacy of surface water to meet our demands.

ii. To arrest decline in ground water levels.

iii. To enhance availability of ground water at specific place and time and utilize rain water for sustainable development.

iv. To increase infiltration of rain water in the subsoil this has decreased drastically in urban areas due to paving of open area.

v. To improve ground water quality by dilution.

vi. To increase agriculture production.

vii. To improve ecology of the area by increase in vegetation cover etc.

### Advantages:

i. The cost of recharge to sub-surface reservoir is lower than surface reservoirs.

ii. The aquifer serves as a distribution system also.

iii. No land is wasted for storage purpose and no population displacement is involved.

iv. Ground water is not directly exposed to evaporation and pollution.

v. Storing water under ground is environment friendly.

vi. It increases the productivity of aquifer.

vii. It reduces flood hazards.

viii. Effects rise in ground water levels.

ix. Mitigates effects of drought.

x. Reduces soil erosion.

The New Delhi-based Centre for Science and Environment estimates that merely capturing the rain water and run off on 2 per cent of India's land area could supply 26 gallons of water per person.

As such much effort is to being made to popularize the concept of rain water harvesting at the grass roots level.

### Potential Areas:

i. Where ground water levels are declining on regular basis.

ii. Where substantial amount of aquifer has been de-saturated.

iii. Where availability of ground water is inadequate in lean months.

iv. Where due to rapid urbanization, infiltration of rain water into subsoil has decreased drastically and recharging of ground water has diminished.

## Methods and Techniques:

The methods of ground water recharge mainly are:

### Urban Areas:

Roof top rain water/storm runoff harvesting through

(i) Recharge Pit

(ii) Recharge Trench

(iii) Tube-well

(iv) Recharge Well

#### Rural Areas:

Rain water harvesting through (i) Gully Plug (ii) Contour Bund (iii) Gabion Structure (iv) Percolation Tank (v) Check Dam/Cement Plug/Nala Bund (vi) Recharge Shaft (vii) Dug-well Recharge (viii) Ground Water Dams/Subsurface Dyke

## In India some of the States made water harvesting Compulsory:

### Tamil Nadu:

Tamil Nadu was the first state to make Rainwater Harvesting compulsory for every building to avoid groundwater depletion. The scheme was launched in 2001 and has been implemented in all rural areas of Tamil Nadu. We can see posters all over Tamil Nadu including Rural areas to

### Geo-textiles:

Recognition of coir for sustainable vegetation and erosion control arises from the fact that it is an abundant, renewable natural resource with an extremely low decomposition rate and a high strength compared to other natural fibers. Coir is woven into thick textiles which are applied like blankets on the ground in erosion prone areas. Geo-textiles made from coir are durable, absorb water, resist sunlight, facilitate seed germination, and are 100% biodegradable. These blankets have high strength retention and a slow rate of degradation meaning they last for several years in field applications.

## Environmental benefits:

Coir is a material which is widely used to overcome the problem of erosion. When woven into geo-textiles and placed on areas in need of erosion control it promotes new vegetation by absorbing water and preventing top soil from drying out. Coir geo-textiles have a natural ability to retain moisture and protect from the suns radiation just like natural soil, and unlike geo-synthetic materials, it provides good soil support for up to three years, allowing natural vegetation to become established.

## Advantages of Coir Geo textile (Coir Bhoovastra):

- a) The high tensile strength of coir fiber protect steep surface from heavy flows and debris movement. Easy to install and huge contour the soil surface due to its heavy weight and ability to absorb water
- b) Totally Biodegradable, 100% natural and provided nutrients.
- c) Water absorbent, thus act as mulch on the surface and as a wick in the soil mantle.
- d) Environmentally friendly and aesthetically pleasing and nonpolluting.
- e) Provides excellent microclimate for plant establishment and healthy growth.
- f) The thick and protruding fibers from the yarn render an extra protection against soil erosion and Provide roughness to the surface floor and hold the soil particles in place.
- g) The intersecting strands move independently of one another in the coir geo textile thereby allaying fear of Wild life entrapment.
- h) The coir geo textile gives the grass plenty of room to grow and at the same time provides large number of "CHECK DAMS" per square meter of soil media, Due to high resistance to salt water action, the coir geo-textiles remains virtually unaffected when used against wave lap erosion.
- During the manufacturing process of coir yarn, no chemicals are used.
- j) Holds the seeds and saplings in place.
- k) Allows sunlight to pass through.

# Construction of Water Harvesting Ponds using Coir Geo-textiles:

Construction of water harvesting ponds using coir geo-textiles is a unique technology. The known advantages of coir geo-textiles we constructed the water harvesting pond using coir geotextiles at Krishi Vignan Kendra, Gadag. Now it is becoming very popular in Karnataka state and PWD department constructing water harvesting ponds using coir geo-textiles in all inspection bungalows.

#### Advantages:

- It is totally a green technology.
- Material is fully eco-friendly.
- No use of steel, cement and sand.
- Low water evaporation.
- Water percolates inside the ground easily.
- Ground water table increases.
- Coir fibre holds the water molecules for long time so that surface water table increases.
- Nearby dry bore-wells re-charges.
- Length, width and depth can be change as per the requirements.
- Easy construction, maintenance and cost effective.

## Laying of coir geo-textiles at sides of the wall and fixing of co-co logs at the edges and bottom corners of the pond:





Farm pond is under construction using coir geo-textiles:





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Tq.: Gadag

HULKOTI - 582 205. Karnataka State

Dist. : Gadag

## TO WHOM SO EVER IT MAY CONCERN

This is to certify that Karnataka State Coir Cooperative Federation Limited is the Enterprise of Govt. of Karnataka. They are in to manufacture of all types of coir products including coir mat, corridor mat, tufted mat, yarns, ropes, matting, geo-textiles etc. They are under taking turn key projects for manufacturing of coir geo-textiles including its laying for different purposes like construction of roads, embankments and water harvesting farm ponds.

They successfully constructed a water harvesting pond (Krishi Honda) at K.H.PATIL KRISHI VIGYAN KENDRA Hulkoti, Gadag District, Karnataka State. The measurement is 25m X 25m X 3.5m of length, width and depth and total storage capacity is 8.00 lakhs liters of water.

The inauguration of the water harvesting pond has been done under the guidance of Shri D.R.Patil former MLA of Gadag Taluk along with a massive group of farmers who had come from neighboring villages. The farmers are coming from various villages appreciated the efforts after seeing this water harvesting pond.

## The major advantages of this water harvesting pond are as follows.

- No use of cement, stone, sand and iron. Used only coir geo-textiles material and it is bio-degradable, environmental friendly.
- Coir fibre is having the inherent property of holding water molecules for long time. Hence water cannot be evaporated early so that surface water recharges quickly.
- Water easily percolates inside the ground through the coir geo-textiles, hence the ground water recharges quickly. Therefore the nearby bore-wells recharges easily.
- 4. The side walls of the pond is fully covered by coir geo-textiles material, it helps to hold the soil without any sliding and it helps to stabilize the soil naturally.
- The side walls of the pond is fully covered by coir geo-textiles material and it helps to climb the animals without any slippage.
- The construction technology of this type of water harvesting pond using coir geo-textiles is very cost effective and economical compared to use of stone, steel and cement.
- This type of water harvesting ponds can be constructed in farmer's field, urban areas and forest area for the purpose of animals to drink water.

We congratulate Karnataka State Coir Cooperative Federation Limited for takingup immediate step to construct such a huge water harvesting pond at our site and it helps us to educate our farmers to use this technology in their fields. We wish them all the success.

Date.16.11.2016

Dr. L.G. Hiregoudar Programme Coordinator & Head



























## Government of Karnataka

[PW,P&IWT Department] (National Highways)

Ph #: 0836-2448545

E-Mail :senhcdwr@gmail.com

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Fax No.2741871

Office of the, Superintending Engineer.

No.SE/NHCD/AE-1/NH-63/Job No.820/Data Rate/2018-19/

To, The Executive Engineer, National Highway Division, <u>Karwar</u>.

NH Circle, Dharwad. Dated. 1.9 JUL 2018 ರಾ ಸೆಂಗಾ ( ಮಂ ಮಂ ನಿ 10.002 destance hor enster do CRANE

Sir,

Ref: Dr. Arunkumar, Managing Director, Karnataka State Coir Cooperative Federation Ltd., (Govt. of Karnataka Enterprises) # 953/A, 2<sup>nd</sup> Main, 4<sup>th</sup> Block, Rajajinagar, Bengaluru-10, letter Dated.25-06-2018.

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Adverting to the above subject. Dr. Arunkumar, Managing Director, Karnataka State Coir Co-operative Federation Ltd., (Govt. of Karnataka Enterprises), Bengalurus' vide reference cited above has submitted Data Rate for Installation of Coir Geotextile mat with grooving vegitation on road side to prevent Land-slide including soil erosion (Retaining wall). The proposal received in this office is forwarded herewith. It is hereby instructed to verify the enclosed Data Rate as per procedure for exection of the said item and to submit with your specific recommendation for approval to the competative rate.

Encl : Data rate & letter.

Yours faithfully,

For Superintending Engineer, National Highways Circle, Dharwad

Copy along with enclooures are forwarded to the Assistant Executive Engineer, NH Sub division, Karwar for information and immediate needful action.

Copy forwarded to the Dr. Arunkumar, Managing Director, Karnataka State Coir Co-operative Federation Ltd., (Govt. of Karnataka Enterprises) # 953/A, 2<sup>nd</sup> Main, 4<sup>th</sup> Block, Rajajinagar, <u>Bengaluru-10</u> for information and to depute the concentred to Division office for explaining your worked Data Rate.

MICT

PD/MNG/FLOOD DAMAGE/WORK ORDER/KDGFR 18-15/2018-19/TCH: //35

To:

### Office of the Executive Engineer, Project Division, Mangalore, Dated: 8/03/2019

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## WORK ORDER

Managing Director, Karnataka State Coir Co-Operative Federation Limited District Industries Centre Building, III Floor, I Cross, Rajajinagara Industrial Estate, Rajajinagara, Bangalore

Sir,

Sub: Agreement in schedule of contract for the work of Permanent restoration and Construction of retaining wall along Kalur Ayyappa To Galibeedu road (using coir technology) in the selected reaches of in Madikeri Taluk, Kodagu District Package No KDGFR 18-15 (Package No KN 18-21) In Pursuant to signing of the contract agreement for the construction : Permanent restoration and Construction of retaining wall along Kalur Ayyappa To Galibeedu road

(using coir technology) in the selected reaches of in Madikeri Taluk, Kodagu District Package No KDGFR 18-15 (Package No KN 18-21) Contract Price of Rs.99,50,000.00 (Rupees Ninety Nine Lakh Fifty Thousands only), you are hereby instructed to proceed with the execution of the said works in accordance with the contract documents. The work should be completed within 90days from the handing over of the site.

> Yours faithfully, Sd/-Executive Engineer, Project Division,

- 1. Copy Submitted to Chief Operating Officer, Karnataka Rural Road Development Agency, 2. Copy submitted to Superintending Engineer, Panchayath Raj Engineering Circle,
- 3. Copy to the Account Superintendent, Project Division, Mangalore along with original 4. Copy to the Assistant Executive Engineer, Project Sub-division, Madikeri along with the

copy of the agreement for necessary action. The date of handing over site to contractor 5. Copy to file along with copy of agreement.

### GOVERNMENT OF KARNATAKA 0:PD/MNG/FLOOD DAMAGE/WORK ORDER/KDGFR 18-15/2018-19/TCH: 135

Office of the Executive Engineer, Project Division, Mangalore, Dated: 8/03/2019

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- 5. Copy to file along with copy of agreement.

Executive Engineer, Project Division, Mangalore.

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U.K	U.K	Godibande	Hassan	Hassan	Uttar Kannada	Gadag	Belgaum	Belgaum	Belgaum	Belgaum	Belgaum	Dist
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Karakatti to Belur of Sirsi -Taluk of U.K-Dist	Maddinpal to Hulekal Vanalli road in Sirsi - Taluk of Uttar Kannad -Dist	Somanahalii to B.B Road with Katenahalii in Gudebande-Taluk of Chikbalapur -Dist	Gopanahalii keregodu via cholenahaliy	Bychanahaili to MDR -7	Dombekai to Haraknalli in Sidda pur -Taluk of Uttar Kannada-Dist	Konnur to Bhaimatti Road in Nargunda - Taluk of Gadag-Dist	Laknapur to Join Nippani via Ambedkar Nagar in Chikodi -Taluk of Belgaum-Dist.	Harugeri to Harugere Terdal road in Kudachi of Belgaum-Dist	Taliwad to MDR (Goliyal ) in Khanapur-To of Belgaum-Dist	Avarkhod to SH-31 (Halyal) of Athani Taluk of Belgaum-Dist	Agrani to Vambatkalfu- Athani- Taluk o Belgaum dist	Name of Road work
R-S Naik	R.S.Naik	Mr Redady	a definition	EU I	N.S.Naik	Mamdapur, Badami	Mulla Nippani	Avthade	Hotpeti	Sallan	Saljan	Name of Contractor
8000	6000	2000	4600	6200	4000	10000	10000	12000	12000	6000	\$800	LengthCoir Technology (Length)
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		Davanagere	Hassan		Hassan	Relaza	Mandva	Ramanagar	Hassan	wavanagere	Devenue	Robert	U.K.	U.K.	-		Shimono	/ Bangalur	tere
	gene		Hassan	Intern	Robert	manuya	Mandan	Magadi	Sakaleshpur	Davanagere	peigaum	a second	Mundavad	Haliyal	Siddapur	Dradravathi		Bangaluru Rural	Taluk
	Savalanga - Monnalli Road to Kudarekonda via Belikoppa Road Honnalli Road	Tq.,	Via Honnedarre, Krishnapura B. Kattihalli to Science and Annual Science and	Biccodu to Padavalu Road -Doddihalli	Laknapur to Nipani, Belagaum District	D. Kabballi Road near Mandya	Byadarahalli	Geiladaradunno to Mottilico uno	Gowdalli to NH 75 Sabalasta	Yaragattihalii to Gangur Road Channagiri Tq	Guddadevi to Bekkinakeri of Belgaum- Taluk of Belgaum-Dist.,	Mundagod-Tq of U.KDist.,	U.kDist.,	Bhemanchil to Bhagavathi in Halival of	Turkuli to Alalli SC colony road in Siddapur Taluk of U.KDist.	Holyhonnur to Holybhyrnahatti in Bhadravathi-Tq of Shimoga Dist.,	rural Subdivision	Guttanahalii to Thinda in Barras	Name of Road work
Total	V.T. Karikal	H.N. Ramegowda	Ramegowda	H.N.	S.A. Mulla	B.S.Raghavendra	Prakash	R.K. Kothari		Hanumanthappa	<b>R.S.Hukkere</b>	R.S.Naik	oupod Hegde		N.S. Naik	Hanumanthappa	Devraj		Name of Contractor
236 003	3000	4400		12000	12000	2000	8000	2000		2160	4000	8000	4000		4000	5200	2000	(Length)	Length Coir
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### GOVERNMENT OF KARNATAKA 10:PD/MNG/FLOOD DAMAGE/WORK ORDER/KDGFR 18-15/2018-19/TCH: 135

Office of the Executive Engineer, Project Division, Mangalore, Dated: 8/03/2019

#### WORK ORDER

To:

Managing Director, Karnataka State Coir Co-Operative Federation Limited District Industries Centre Building, III Floor, 1 Cross, Rajajinagara Industrial Estate, Rajajinagara, Bangalore

Sir,

Sub: Agreement in schedule of contract for the work of Permanent restoration and Construction of retaining wall along Kalur Ayyappa To Galibeedu road (using coir technology) in the selected reaches of in Madikeri Taluk, Kodagu District Package No KDGFR 18-15 (Package No KN 18-21)

In Pursuant to signing of the contract agreement for the construction : Permanent restoration and Construction of retaining wall along Kalur Ayyappa To Galibeedu road (using coir technology) in the selected reaches of in Madikeri Taluk, Kodagu District Package No KDGFR 18-15 (Package No KN 18-21) Contract Price of Rs.99,50,000.00 (Rupees Ninety Nine Lakh Fifty Thousands only), you are hereby instructed to proceed with the execution of the said works in accordance with the contract documents. The work should be completed within 90days from the handing over of the site.

Yours faithfully, Sd/-Executive Engineer, Project Division, Mangalore.

 Copy Submitted to Chief Operating Officer, Karnataka Rural Road Development Agency, Bangalore for kind information

- Copy submitted to Superintending Engineer, Panchayath Raj Engineering Circle, Mangalore for Kind information
- Copy to the Account Superintendent, Project Division, Mangalore along with original agreement.
- Copy to the Assistant Executive Engineer, Project Sub-division, Madikeri along with the copy of the agreement for necessary action. The date of handing over site to contractor shall be intimated immediately.
- 5. Copy to file along with copy of agreement.

Executive Engineer. Project Division. Mangalore.

GOVERNMENT OF KARNATAKA (Public Works, Port and Inland Water Transport Dept.) BAGALKOT DIVISION, BAGALKOT – 587 103.

#### : Issue of Notice to proceed with the work ;

Date :

No.PW0/BGK/TA/FB-5/3054/KW1/2019-20

04 JUL 2019

To

Managing Director. Karnstaka State Coir-Co-Operative Federation Limited, District Industries Centre Building, Itil Floor, I cross Rejajinagar Industrial Estate, Rajajinagar, Bangatore

#### Dear Sirs.

Pursuant to your furnishing the requisite Security deposit as stipulated in ITT Clause 24.1 and signing of the contract agreement for the work. Stabilization of cutting surface of rock in Kagawad-Kaladagi- SH-53 road from Km 60.42 to 60.90 in Jamakhandi Taluka of Bagalkot Dist. (General) Under: 3054-SH Maintenance 2018-19 (e-

proc work index Nor 104706). For the Contract Price of Rs. 1990180.00 you are hereby instructed to proceed with the execution of the said works in accordance with the contract documents. (Vide agreement no.PWD/BGK/TA/P8-5/3054/KW1/2015-19/ dated:

#### Stipulated date for completion of the work:

#### Yours faithfully.

#### Executive Engineer, PW,P & I WT Dept Dwn Bagalkot.

Copy submitted to Chief Engineer, C & B (North) Dharwad for favour of kind information.

Copy submitted to Superintending Engineer, PW and P & I WT Dept. Belgaum Circle Belgavi for favour of kind information.

Copy forwarded to Executive Engineer, PW, P & IWT Dept Quality Assurance Division Belagavi for kind information.

Copy forwarded to Assistant Executive Engineer, PW, P & I WT Dept. Quality Assurance Sub Division Belagavi for Information.

Copy forward to Assistant Executive Engineer, PWP, and IWT Dept Sub Division Jamakhandi for information.

heer Execute PW.P & I WT Dedt Divo Bagalkot.

Kalur road photos:























































Rural Road Construction Using Coir Geo-Textiles:























# MINING DUMPS STABILIZATION USING COIR GEO-TEXTILES:















