

CHECKDAMS: THE DANGS



The Scenario

Water has been a pressing concern in Gujarat for several decades. With the coming of the Green Revolution, the demand for water escalated and like the rest of the country, the water table in Gujarat steadily started dropping. At the turn of the millennium, the State, with the help of its citizens, launched a massive scheme to recharge its groundwater – the Sardar Patel Participatory Water Conservation Project. The project's mission was the large-scale construction of small water harvesting and ground recharge structures through people's participation. Most of these structures have been built on community land and reports indicate that there has been a commendable increase in the water table, resulting in better returns to farmers. Since the time this project was launched, Gujarat now has about six lakh water harvesting structures. At a time when the water table is still dropping in the rest of India, Gujarat is among the only states where it is rising. Farmers are now not only able to harvest the kharif crop, but are also able to cultivate rabi crops when monsoons are normal.

A note on benefits to poor farmers on account of assured irrigation support and agricultural diversification is in Attachment-1.

Opportunity for CSR

- **Repair of checkdams:** A large number of checkdams built across the State over a period of nearly 15 years are in need of repair. Problems such as silting, damaged gates and broken structures need to be addressed for optimal water harvesting.
- **Irrigation:** Water-harvesting structures such as checkdams are the starting point for increasing the area under irrigation. However, for poor farmers to actually reap the benefits of better land and water productivity, they need to be able to lift the water from the checkdams and convey it to their farms. They need assistance for portable diesel pumps and flexible pipes as they are usually too poor to purchase these on their own, and therefore fail to meaningfully benefit from water harvesting initiatives.
- **Agricultural diversification:** With better and more reliable availability of water through checkdams, the farmers have the opportunity to make a transition from the cultivation of their traditional low value crops, to high value varieties including vegetables. Agricultural diversification can be facilitated for these farmers by providing them assured access to quality seeds, fertilisers and extension services.

Potential Project Area:

The Dangs

The Dangs is a tribal district on the southern tip of Gujarat. It receives heavy rains in the monsoon months. Even so, due to the hilly terrain and the hard strata that disallows percolation into the ground, the abundant water that is received during the monsoon wastes away as runoff, creating acute water scarcity. Checkdams that have already been constructed in the district are in need of repair and maintenance.

A note on the The Dangs district is in Attachment-2. A note on taluka-wise checkdams identified for upgrading and repair is in Attachment-3.

Opportunities for CSR in The Dangs

- **Identified checkdams:** Thirty checkdams have been identified for repair work. The extent of repair required per checkdam will vary depending on the damage sustained by each dam.
- **Implementing Agency:** The Rovadan Trust has been working with poor farmers in The Dangs and has good knowledge and experience of field realities. Companies interested in CSR in The Dangs can collaborate with the Trust for the implementation of their project.
- **Irrigation kit:** A portable diesel pump and 600 m of HDEP flexible piping can be provided per farmer to enable them to transport the water from the checkdam to their farm.
- **Agricultural diversification kit:** A kit consisting of quality seeds and fertilisers can be distributed to farmers in the command area to help farmers make a transition to high value crops.
- **Extension services and technical support:** These services can be provided to farmers so that they can diversify to high value cultivation in a scientific manner.

Estimated Project Costs

- **Checkdam repair:** About Rs. 1.5 lakh – Rs. 2 lakh, depending on the extent of repair work required.
- **Irrigation kit:** Each kit will comprise a portable diesel pump worth about Rs. 40,000 and 600 m of HDPE flexible piping worth about Rs. 55,000, which will be suitable for one check dam. Total cost towards irrigation support will depend on the number of check dams being taken up.
- **Agricultural diversification kit:** The total cost of the agricultural diversification kit that includes quality seeds and fertilisers for farmers in the command area would be about Rs. 3 lakh per check dam depending on the command area which is likely to be irrigated
- **Extension services:** The total cost of providing extension services and other technical support would be an estimated Rs. 1 lakh per check dam. This cost can be reduced if more than one Check dam is supported.

Developing the CSR Project

The Gujarat CSR Authority (GCSRA) can be approached for further details and assistance for developing a checkdam-based agro initiative in The Dangs. They can also facilitate the tie up with the implementing agency.

GCSRA can also provide support, on charge basis, for development of a project report, execution level support and monitoring.

Project Benefits

- **Water security:** Currently, the damaged checkdams cannot hold water to their optimum capacity. After repairs, their water holding capacity will be optimised, bringing water security during critical stages in farming cycles, and consequently, improved economic situation for farmers.
- **Equity:** With the distribution of irrigation kits to poor farmers, equity in access to water is ensured. Typically, it is the wealthier farmers who gain most from checkdams as they have the means to invest pumps and pipelines for lifting water from the checkdams. However, by providing poor farmers with diesel pumps and pipes, equity in access to water is ensured to farmers, regardless of the economic strata to which they belong.
- **Agricultural diversification:** A large section of farmers in The Dangs cultivate indigenous, low-yielding varieties of paddy since the changeover to high-value crops is expensive. By providing them kits with quality seeds and fertilisers as well as extension services, they can cultivate high-value crops and vegetables such as bottle gourd, okra, bitter gourd, etc.
- **Improved farmers' income:** The integration of water security, irrigation and farm level interventions will ultimately translate into better incomes for economically backward tribal farmers. One, they will be able to cultivate both rabi and kharif crops, and two, they will be able to diversify to crops that have better market value. Assured irrigation support along with crop diversification is expected to pull the participating families out of poverty.

Financing structure

Participating farmers are expected to contribute Rs. 2,500 per acre as joining contribution for taking up cultivation of Okra. In return they will receive support for high performance seeds, fertilizers, pesticides, and if needed, technical support, packing crates, etc.

They are also expected to bear the cost of diesel as and when they use the diesel pumps for irrigation and contribute Rs. 30 per day of use of diesel pumps. This daily contribution will be used for periodic replacement of engine oil and maintenance of the pumps.

Remaining cost, as mentioned earlier, will have to be contributed by the sponsoring Company.

About Rovadan Trust

Rovadan Trust is a registered (Registration No.: F/699/Valsad(22-10-2003) non-governmental organization(NGO) working in Gujarat, India. Established in the year 2003 by the Rotary group, Rovadan Trust works in the area of Rural Development & Poverty Alleviation, Tribal Welfare, Womens Development & Empowerment, etc. The organization works towards the promotion of sustainable development. The Trust is closely associated with the industrial sector of Vapi. It can be contacted at Rovadan Trust, Deval Pada, Mandir Road, Ahwa, District-Dangs, Gujarat, India Pin. 394710. Its contact number is 02631-220653

Benefits to the Sponsoring Company

The support of sponsoring companies will be acknowledged in the following manner:

- a. Every repaired check dam will carry a signboard mentioning the financial contribution by the sponsoring company. A photograph of the repaired check dam along with the sign board will be sent to the company for use in its annual report;
- b. Details of individual farmers benefitted, extent of their annual income, their photographs and name of the sponsoring company will be displayed at the website of the GCSRA and also sent to the sponsoring company; and
- c. GCSRA will carry out an independent impact assessment survey and send a copy to the sponsoring company, besides displaying the report at its website.

Whether the proposal is supported by the district administration?

Yes.

I. ROLE OF IRRIGATION IN POVERTY REDUCTION

Dillon, A. (2011), The effect of irrigation on poverty reduction, asset accumulation, and informal insurance: Evidence from Northern Mali, World Development, 39(12), pp. 2165-2175.

- Empirical evidence suggests that irrigation projects have positive impacts on agricultural production and the reduction of poverty for farmers. Households with irrigation save between 4.5 and 6.4 more total livestock units.
- Irrigation investments increase agricultural production by increasing land productivity.
- Significant positive increases in total household consumption, agricultural production and livestock holdings are estimated for households who have access to irrigation.
- The cost of small scale irrigation projects are quite small and gains in assets, annual production and consumption estimates suggest a positive benefit-cost ratio along with secondary effects like asset accumulation and informal sharing within village.

II. AGRICULTURE AND POVERTY REDUCTION

Christiansen, L., Demery, L. and Kuhl, J. (2010), *The (Evolving) role of agriculture in poverty reduction, an empirical perspective, United Nations University- World Institute for Development Economics Research, Working paper No. 2010/36, pp. 1-37.*

- Results suggest that agriculture is significantly more effective in reducing poverty among the poorest of the poor. It is also up to 3.2 times better at reducing \$1-day headcount poverty in low income and resource-rich countries.
- Agricultural multiplier probably lies in the range of 1.6 to 1.8 for Asia. Every dollar in direct income generated in agriculture, triggers another 30 to 80 cents in second round income gains elsewhere in the economy.
- Poor people stand to benefit much more from agricultural growth than non-agricultural growth because they live mostly in rural areas and earn their living in agriculture or related activities. Growth in agriculture (which is highly labour intensive) is the most poverty reducing, followed by manufacturing and construction. Larger the share of land cultivated by small and medium farmers, the lower the observed income inequality, and thus the greater the impact of growth on poverty.

III. CROP DIVERSIFICATION FOR POVERTY REDUCTION

Birthal, P. S., Roy, D. and Negi, D. S. (2015), Assessing the impact of crop diversification on farm poverty in India, World Development 72, pp. 70-92.

- Though the agriculture sector currently contributes only 14% to the national income, it engages about half of country's workforce. Over two-thirds of households cultivate farms measuring less than or equal to 1 ha.
- Crop diversification out of staples towards high value crops (HVC) is one of the alternatives that can augment incomes, generate employment and reduce poverty.
- The capacity to bear risk is lower for small farmers and riskiness of HVC is very high. The poverty impact of such diversification is related to participation of small farmers and labour intensity of this activity. Poor farmers have relatively high labour endowments. There is a distinct inverse relationship between farm size and productivity.
- Diversification towards HVC occurred largely by replacing low value coarse grains and not rice and wheat.
- HVC are highly labour intensive as many field operations cannot be accomplished by machines and require human labour.

IV. AGRICULTURAL INPUTS AND POVERTY

Abro, Z. A., Alemu, B. A. and Hanjra, M. A. (2014), *Policies for agricultural productivity growth and poverty reduction in Rural Ethiopia, World Development, 59, pp. 461-474.*

- Agricultural productivity has a positive impact on improving the indicators of welfare of rural households and has a direct impact on poverty reduction.
- Doubling the amount of fertilizer consumed will lead to a rise in real value of output by nearly 16%.

Kassie, M., Shiferaw, B., and Muricho, G. (2011), *Agricultural technology, crop income, and poverty alleviation in Uganda, World Development, 39(10), pp. 1784-1795.*

- Adoption of high yielding varieties have a positive impact on household well-being.
- Farmers that adopted improved ground nut varieties have a higher surplus (200 kg), compared to non-adopters (62 kg) to sell. Non-adopters mentioned lack of access to seed (57%), lack of credit (30%), and lack of information about new varieties (14%). About 29% of adopters were constrained by seed and credit availability from expanding production. Incidence of adoption was higher among average to small farm owners, compared to large farm holders. Lack of access to seeds and distance to main market are negatively associated with adoption.
- Impact of adoption on crop income decreases with farm size and increases with educational level.

V. HORTICULTURE AND AGRICULTURAL DIVERSIFICATION

Singha, K., Chaudhary, R. and Vishnu, K. (2014), *Growth and diversification of horticultural crops in Karnataka: An inter district analysis*, Sage Open, July-September, pp. 1-12, accessed from <http://www.uk.sagepub.com/aboutus/openaccess.htm>, downloaded on 24/06/2015.

- Horticulture has been one of the fastest growing sectors within the larger agriculture activities in the state having high profitability with scope for higher employability and raising income of farming community. Area under horticultural crops in the country has increased from 12,770,000 ha in 1991-92 to 21,825,000 ha in 2010-11 accounting for CAGR of 2.7%. Horticultural crops in the country covered an area of around 7% of the total cropped area, of which, 2% is under vegetables.

Weinberger, K. and Lumpkin, T. A. (2005), *Horticulture for poverty alleviation- The unfunded revolution*, AVRDC- The World Vegetable Center, AVRDC Publication No. 05-613, Working Paper No. 15, pp. 1-16.

- Organic trade from developing to developed countries is currently growing at over 20% per year. The horticulture export industry provides an important source of foreign exchange generates substantial employment and has contributed to the upgrading of agricultural production skills. In Africa Asia and Latin America high value crop exports are female intensive industries, with women dominating most aspects of production and processing. Horticulture produce has high value added and income generation potential, and due to a relative lack of economies of scale their production is attractive especially for small-scale farmers has a comparative advantage particularly under condition where arable land is scarce, labor is abundant and markets are accessible. And transportation infrastructure has seen dramatic improvement.
- Horticulture crops tend to be riskier than staple crops, since higher cost associated with production impose a greater income risk. In addition, the profit of horticulture crops tends to be more variable because they have both more variable yield and more variable prices. In addition, government usually do not regulate the price of horticulture crops.
- A major limitation of fruit and vegetable production in many developing countries is the availability of good quality seeds. Individual markets are too small to attract the interest of the private sector. Seeds are often contaminated by seed transmitted pests and diseases, and are genetically diverse.
- Horticulture production is severely constrained by post harvest losses which reduce profit to farmers and marketers. Horticulture crops are often highly perishable.

THE DANGS: DISTRICT AT A GLANCE

Headquarters: Ahwa

Talukas: 3 (Ahwa, Subir and Vaghai talukas)

Geographical area: Total area of **172357 Ha.**; out of which **101690 Ha.** is forest land and about **57840 Ha.** agriculturable land

Major rivers: Purna and Gira Rivers in Purna basin, and Ambica and Khapari Rivers in Ambica basin of south Gujarat region

Average annual rainfall: 100 inches

Major crops: Maize, rice, ground nut and finger millet

Population profile: 94% Scheduled Tribes; 74% of total population belong to BPL category

IRRIGATION AND ROLE OF STATE

No major, medium or minor irrigation scheme exists in the district. Therefore, farmers are totally dependent on monsoon and face acute water scarcity by March. Due to dense forest cover and the geological profile of The Dangs, major dams are not possible to construct in the district. However, government agencies have initiated schemes for constructing small water harvesting structures across the district.

Recent years have seen the construction of an estimated 2,000 small and big checkdams and 325 water storage tanks. Due to heavy rainfall, nearly 78 water harvesting structures are in need of repair and upgrading. Of these, over the next two years, the local government agency plans to upgrade at least 25 water harvesting structures. Upon the upgrading of these 25 structures, approximately 110 Ha of land will be benefitted and the water table of the surrounding area will rise.

ATTACHMENT – 3: CHECKDAMS IDENTIFIED FOR UPGRADATION IN THE DANGS

Upgradation of Checkdams in Dang District - Ahwa Taluka

Sr. No	Name of Scheme/ checkdam	Village	Taluka	District	River	Estd. Cost (Rs. In Lakh)	Packages		Storage Capacity (In Mcft)	Area Benefitted (Ha)
1	Vihir Amba-03	Vihir Amba	Ahwa	Dang	Tributary of Khapari	25.00	25.00	1	0.01	3.80
2	Vakariya	Vakariya	Ahwa	Dang	Tributary of Khapari	10.00	30.00	2	0.01	3.80
3	Malegaon	Malegaon	Ahwa	Dang	Tributary of Khapari	20.00			0.01	4.00
4	Bhisiya-1	Bhisiya	Ahwa	Dang	Tributary of Khapari	15.00	30.00	3	0.01	4.00
5	Borkhet-1	Borkhet	Ahwa	Dang	Tributary of Khapari	15.00			0.01	4.00
TOTAL RUPEES						85.00			0.05	19.60

Upgradation of Checkdams in Dang District - Waghai Taluka

Sr. No	Name of Scheme/ checkdam	Village	Taluka	District	River	Estd. Cost (Rs. In Lakh)	Packages		Storage Capacity (In Mcft)	Area Benefitted (Ha)
1	Supdahad-03	Supdahad	Waghai	Dang	Tributary of Ambica	15.00			0.01	4.00
2	Maharaichond	Maharaichond	Waghai	Dang	Tributary of Ambica	10.00	25.00	1	0.01	4.00
3	Gundvahal	Gundvahal	Waghai	Dang	Tributary of Ambica	25.00	25.00	2	0.01	4.00
4	Bheskatari-1	Bheskatari	Waghai	Dang	Purna	16.00			0.01	4.00
5	Bheskatari-2	Bheskatari	Waghai	Dang	Purna	17.80	33.80	3	0.01	4.00
6	Bhujad-1	Bhujad	Waghai	Dang	Purna	14.80	14.80	4	0.01	4.00
7	Bhongadiya-1	Bhongadiya	Waghai	Dang	Purna	11.75			0.01	3.80
8	Bhongadiya-2	Bhongadiya	Waghai	Dang	Purna	14.25	26.00	5	0.10	4.00
TOTAL RUPEES						124.60			0.17	31.80

Upgradation of Checkdams in Dang District - Subir Taluka

Sr. No	Name of Scheme/ checkdam	Village	Taluka	District	River	Estd. Cost (Rs. In Lakh)	Packages		Storage Capacity (In Mcft)	Area Benefitted (Ha)
1	Bhondvihir-1	Bhondvihir	Subir	Dang	Purna	14.60	30.41	1	0.01	6.00
2	Bhondvihir-2	Bhondvihir	Subir	Dang	Purna	15.81		0.01	4.50	
3	Behdun-1	Behdun	Subir	Dang	Purna	16.60	33.20	2	0.01	5.00
4	Behdun-2	Behdun	Subir	Dang	Purna	16.60			0.01	5.00
5	Amsarpada-1	Amsarpada	Subir	Dang	Purna	24.50	41.80	3	0.01	5.00
6	Amsarpada-2	Amsarpada	Subir	Dang	Purna	17.30			0.01	6.00
7	Barada-1	Barada	Subir	Dang	Purna	19.60	37.40	4	0.01	6.00
8	Barada-2	Barada	Subir	Dang	Purna	17.80			0.01	6.00
9	Bibupada-1	Bibupada	Subir	Dang	Purna	15.00	29.95	5	0.01	4.00
10	Bibupada-2	Bibupada	Subir	Dang	Purna	14.95			0.01	4.00
11	Bilbari-2	Bilbari	Subir	Dang	Purna	14.50	29.50	6	0.01	3.50
12	Bilbari-3	Bilbari	Subir	Dang	Purna	15.00			0.01	3.50
TOTAL RUPEES						202.26			0.12	58.50

Summary of Checkdams to be Upgraded in Three Talukas

Sr. No.	Name of Taluka	Estimated cost (Rs. in Lacs)	Area benefited in Ha.
1	Ahwa	85.00	19.60
2	Waghai	124.60	31.80
3	Subir	202.26	58.50
	TOTAL	411.86	109.90