

# Hasdeo Bango Project: Changing Allocation Pattern

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India liberalised its economy in 1991 in the wake of the balance of payments crisis. The average growth rate thereafter, from 1992- 2003 was around 6.0 percent, which projected India as one of the leading economies in the world (Ahluwalia, 2002). On one hand the share of agriculture in the Gross Domestic Product (GDP) has been decreasing continuously since 1991 and on the other hand the share of industry and the service sector has been increasing since 1991 (Ahluwalia, 2002). The changing profile of the Indian economy has also proportionately increased the pressure to alter the allocation of natural resources significantly especially that of land and water. The rising demand for common natural resources from industries has put pressure on the government to allocate more resources to industry as they contribute more to the GDP. In this growth story some states have certainly taken the lead over others, one such state is Chhattisgarh. Chhattisgarh's GSDP has been growing at a rate of more than 8 percent for the last 8 years (The Economic Times, 2011). The State's output of coal has increased by 100% and the output of iron ore by 70% in the last 10 years (The Economic Times, 2011) The state has attracted 1.22 lakh crores investment with the signing of 260 Memorandums of Understanding (MOU)s (Deshbandhu, 2011). These companies have invested mainly in power and steel. Both of these industries require large quantities of water for their operations along with other natural resources. The state is fulfilling this rising demand for water from industry by allowing them to withdraw water either from rivers directly or supplying them with water from large water projects. The supplying of water from large irrigation projects and rivers to industry may reduce water supply for irrigation, which in turn may result in conflicts between farmers and industrialists over water to fulfil their respective interests. One such conflict has arisen around the Hasdeo-Bango project, which is a multipurpose irrigation project. The government has signed MOUs with various companies to provide 60 MCM water from the Hasdeo-Bango Project, which is 50 MCM more than the pre-decided industrial quota of water from the project.

This case study attempts to enquire if there is any diversion of water from agriculture to industries because of the rising industrial demand for water and if yes, what are the social, economic and environmental impacts of diversion of water from agriculture to industry. This case study has been done as part of a one month internship to fulfil an academic requirement for my post-graduation. The case study is mainly based on field research, interviews of various stakeholders and analysis of data on the Hasdeo-Bango project, provided by the Department of Water Resources. The first part of this case study is a detailed profile of the Hasdeo-Bango project, its objectives and the impact on lives and livelihoods after its construction. The second part of this paper talks about the socio-economic profile of the region. The third part talks about the conflicts arising around Hasdeo-Bango, their causes and effects. The fourth and last part is a suggestive framework for resolution of the conflict between industry and agriculture.

### **Salient Features of the Hasdeo-Bango Multipurpose Project**

Hasdeo-Bango multipurpose project is primarily an irrigation project, which was started in the 1960s on the Hasdeo River in Bilaspur district of then Madhya Pradesh. The main purpose of this project is to provide water for irrigation for all three crop seasons. The project was completed in 4 phases. In the first phase, the Hasdeo Barrage was constructed on Hasdeo River at Darri village near Korba town. In phase II a canal system of 48 km was constructed (Central Water Commission, 2013). In Phase III and IV Minimato-Bango Dam was built 42 KM upstream of Hasdeo Barrage (Central Water Commission, 2013). This project has created an irrigation potential of 433,500 hectares and hydropower generation capacity of 40\*3 MW (Central Water Commission, 2013). The project was completed in 2011. The table below has a brief profile of the Hasdeo-Bango project.

**Table 1: Salient Features of Minimato (Hasdeo) Bango Dam**

<b>Name of the Dam</b>	<b>Minimata (Hasdeo) Bango Dam</b>
<b>Latitude (N)</b>	22°36
<b>Longitude (E)</b>	82°36
<b>District</b>	Korba
<b>State</b>	Chhattisgarh
<b>Basin Name</b>	Mahanadi
<b>River</b>	Hasdeo
<b>Dam Type</b>	Earthen / Gravity / Masonry

<b>Dam Status</b>	Completed
<b>Purpose</b>	Hydroelectric, Irrigation
<b>Type of project</b>	Major
<b>Engineering Type of Project</b>	Diversion, Storage
<b>Year of Completion (Irrigation System)</b>	2011
<b>Length of Dam (m)</b>	554.5
<b>Dam Height (m)</b>	87
<b>Catchment Area (km<sup>2</sup>)</b>	6,730
<b>Mean Annual Flow (MCM)</b>	3,540
<b>FRL – Full Reservoir Level (m)</b>	359.66
<b>MDDL Maximum draw down level (m)</b>	329.79
<b>Gross Storage Capacity (MCM)</b>	3,416
<b>Live Storage Capacity (MCM)</b>	2,894 <sup>1</sup>
<b>Length of spillway (m)</b>	203.5
<b>Type of Spillway gates</b>	RADIAL
<b>Number of Spillway gates</b>	11
<b>Size of Spillway Gates (m X m)</b>	15 x 14
<b>Crest Level of spillway</b>	345.66
<b>Spillway capacity (cumec)</b>	24000
<b>Ultimate Irrigation Potential (Thousand ha)</b>	433.5
<b>Hydropower (MW)</b>	120
<b>Seismic Zone</b>	Seismic Zone-III
<b>District/s Benefitted</b>	Bilaspur/ Korba/ Raigarh/ Janjgir- Champa
<b>Project Covered under ERM Scheme</b>	No
<b>Project Covered under CADA Scheme</b>	Yes
<b>Project Covered under AIBP Scheme</b>	Yes

Source: (Central Water Commission, 2013)

The Hasdeo-Bango Project irrigates through Akaltara Branch Canal System and Janjgir Branch Canal System. The command area of this project lies in Janjgir- Champa, Korba and Raigarh district. Industries also take water from these canals as per their allocation. The diagram below is a snapshot of Hasdeo-Bango Irrigation System.

<sup>1</sup> The initial capacity of Hasdeo-Bango was 3,040 MCM, which has been reduced to 2,894 MCM due to siltation.

The main objective of the Hasdeo-Bango project is to provide water for irrigation but it also has some other objectives.(Central Water Commission, 2013). The main objectives of this project are:

- To irrigate 433,500 ha agricultural land annually.
- To generate 120 MW hydropower.
- Cater the domestic water needs of Korba Town.
- To provide 441 MCM water for industrial needs.

### **Socio Economic Profile of the Region**

These four districts Bilaspur, Janjgir-Champa, Korba and Raigarh are primarily populated with other backward castes (OBCs), farming communities and Schedule castes (SC) and Schedule tribes (ST). The four districts Bilaspur, Janjgir-Champa, Korba and Raigarh have SC/ST forming 38.14% of their combined population (Census, 2011). 70% of the combined population depends upon agriculture for their livelihood. On an average 35% of the total population are agriculture labourers in these four districts (Census, 2011).

The per capita income in the region is below the national average (Economic Census, 2011). The literacy rate in the region has increased in the last decade (Census, 2011). The tribal population is also dependent on commons such as rivers and forests for their livelihood besides simply agriculture. Chhattisgarh is last in the 23 states<sup>2</sup> in terms of HDI scores (Human Development Report, 2011).

The people who are living in this area since the 1960s have confirmed that the agricultural productivity has risen after irrigation facilities become available in the region<sup>3</sup>. Migration to other places has reduced and the income level has risen. However, a causal relation cannot be established as income level and agricultural productivity has risen at all places in India.

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<sup>2</sup> The HDI report has been released for all states, but the all north eastern states except Assam were in one category "North Eastern India".

<sup>3</sup> The data at district level is unavailable for the years before construction of Hasdeo-Bango. So it is difficult to verify whether socio economic parameter of region has really improved or not.

## **Agriculture**

The primary occupation of the majority of the population in the region is agriculture as clearly seen from the data above. This region is known as the rice bowl of Chhattisgarh. The major crop in the region is rice which is being cultivated on 65% of the total cultivated area (Indira Gandhi Krishi Vishwavidhyalaya, 2012). Other major crops are wheat, lentil, gram and Kedo Kutki. The second crop is also rice wherever irrigation facilities are available. The majority of farmers prefer to cultivate rice in both seasons. The total production of rice in the area in 2009 was 464.7 metric ton in Janjgir-Champa district alone (Indira Gandhi Krishi Vishwavidhyalaya, 2012).

## **Conflict arising around Hasdeo-Bango**

The Chhattisgarh government has planned to generate 50,000 MW of power in the state by 2020 (Deshbandhu, 2011). The government has allowed companies to establish coal based thermal power plants of combined capacity of 37,000 MW in Janjgir district alone. These power plants require huge amounts of water for their operations (Technical Study: Best Practices in Water Usage in Coal Based Thermal Power Plants, 2013). The Hasdeo-Bango project provides water for industries as well as for agriculture. Ramprasad Singh, a local farmer of Darri complained that government is not giving water to him and other farmers for irrigation of the Rabi crop and is diverting it to the industries as they can offer to pay a higher price for water. On the other hand, the state claims that it is not giving more water than their quota to industries, and it can supply water only for crops other than rice during Rabi. However as shown in this study, the state has already given permission to industries for withdrawing more water than the industrial quota. A conflict therefore has arisen between farmers and the state mainly because of the state's denial for water for rice crops in the Rabi season. Such diversions of water from agriculture to industry will have a far reaching impact on the region, as majority of the population depends on agriculture.

The live capacity of Hasdeo-Bango reservoir is 2,894 MCM as per Table 1. The original project document has clearly divided the water among industry, agriculture, domestic needs and estimated water losses as per the table below.

**Table 1: Water allocation and losses**

S. No.	Purpose	Water Allotted (MCM)	Water Given Actual(MCM) As per year 2012
1.	Agriculture	1,810	NA
2.	Industry	441	431.491
3.	Domestic purposes of Korba Town	14	1.82
4.	Water Losses due to Evaporation <sup>4</sup>	229	NA
5.	Carry Over <sup>5</sup>	600	Depends on Year

Source: (Ministry of Water Resources, Government of Chhattisgarh, 2014)

The amount of water for industry and domestic purposes is fixed. The water for irrigation has been calculated on the basis of crop pattern in the area, and the project document specifies that the project can irrigate 173,100 ha of land in the Rabi season and 2,47,400 ha rice crop in Kharif season.

The following table shows the level of water in the dam at the end of monsoon season and before the start of the monsoon season in the region. The water, during this period has either been given for Rabi irrigation, industries, domestic purposes or has fallen under the head of 'water losses'.

**Table 2: Position of Water in Hasdeo-Bango, 2005-2014**

S. No.	Year	Water Level		Water in Level		Water Used (MCM)
		Date	Water in Dam (MCM)	Date	Water in Dam (MCM)	
1	2006	15.10.2005	2,291.16	15.06.2006	1,082.03	1,209.13
2	2007	15.10.2006	2,337.93	15.06.2007	815.11	1,524.86
3	2008	15.10.2007	1,572.89	15.06.2008	927.55	643.34
4	2009	15.10.2008	2,356.31	15.06.2009	1,138.03	1,216.29
5	2010	15.10.2009	1,471.60	15.06.2010	845.35	626.25
6	2011	15.10.2010	NA	15.06.2011	1,081.80	--
7	2012	15.10.2011	2,800.39	15.06.2012	1551.33	1,249.06
8	2013	15.10.2012	2,463.68	15.06.2013	1,555.05	908.63
9	2014	15.10.2013	2,570.61	15.06.2014	2,278.99	291.62

Source: (Ministry of Water Resources, Government of Chhattisgarh, 2014)

The Department of Water Resources states that it has ensured designated supply of water to all consumers (Dubey, Anil K., Chief Engineer, Hasdeo-Bango Scheme (2014, July 8), Telephone Interview). They have said agriculture is their first priority and they are supplying water to agriculture without any reduction in quota. The Department also mentions that

<sup>4</sup> Water losses may vary depending upon temperature and other environmental factors.

<sup>5</sup> Carry over means water reserved in dam for next year.

they can supply water to irrigate 173,100 ha in Rabi season if farmers cultivate crop other than rice. The below table has irrigation data from 2004 to 2014 from Hasdeo-Bango.

**Table 3: Chhattisgarh State Irrigation Statistics, 2004-2010**

S. No.	Financial Year	Kharif Irrigation (Targeted) In Hectares	Kharif Irrigation (Actual)		Rabi Irrigation (Targeted) In Hectares	Rabi Irrigation (Actual)	
			Hectare	% of Target		Hectare	% of Target
1	2004-05	247,400	182,651	73	173,100	83	0.04
2	2005-06	247,400	267,395	84	173,100	246	0.14
3	2006-07	247,400	214,394	86	173,100	31,008	17.9
4	2007-08	247,400	210,834	88	173,100	0	0
5	2008-09	247,400	221,047	89	173,100	3200	1.84
6	2009-10	247,400	220,861	89	173,100	--	NA
7	2010-11	247,000	--	NA	173,100	--	NA
8	2011-12	247,000	221,000	89.5	173,100	35,297	20.39
9	2012-13	247,000	221,260	89.5	173,100	35,200	20.33
10	2013-14	247,000	122,500	90	173,100	2,061	1.19

Source: (Chief Engineer, 2014)

Hasdeo-Bango can allot up to 441 MCM water to industries (Chief Engineer, 2014). The Chief Engineer of the Hasdeo-Bango project states that it is currently allocating 431.5 MCM water to industries which is well in the limit decided in project documents. The details of water allocation to different industries are as following:

**Table 4: Details of water allocation to industries from Hasdeo-Bango Project<sup>6</sup>**

S. No	District	Company	Water Allotted (MCM)	Water Source	Old Rate (RS/M <sup>3</sup> )	New Rate (RS/M <sup>3</sup> )
1	Korba	CG State Electricity Board (East), 440 MW	21.00	Hasdeo-Bango Project (Left bank Canal RD 3800 M Power Canal, Korba City)	3.60	10.65
2	Korba	CGState Electricity Board, (West), 840 MW	23.00	Hasdeo-Bango Project (Hasdeo-Bango Reservoir)	3.00	9.13
3	Korba	BALCO, Korba	10.20	Hasdeo-Bango Project (Left Bank Canal, Main Power Canal RD 2970, Korba City)	3.60	10.65
4	Korba	IOL (IBP), Gopalpur	0.078	Hasdeo-Bango Project (Hasdeo-Bango Reservoir near Goplapur Village)	3.00	9.13
5	Korba	SECL, Korba	0.93	Hasdeo-Bango Project (Left Main Canal, RD 4560 M)	3.60	10.65

<sup>6</sup> The price of water is different on the basis of source of water. If company is taking water from reservoir the price is Rs. 9.13 /M<sup>3</sup> and if it is taking from canal the price is Rs.10.65/M<sup>3</sup>.

S. No	District	Company	Water Allotted (MCM)	Water Source	Old Rate (RS/M <sup>3</sup> )	New Rate (RS/M <sup>3</sup> )
				Korba City)		
6	Korba	SECL, Kusmunda	1.490	Hasdeo-Bango Project (Right Bank Canal, RD 7200M Korba City)	3.60	10.65
7	Korba	SECL, Gevara	1.260	Hasdeo-Bango Project Right Bank Canal, RD 7200M Korba City)	3.60	10.65
8	Korba	BALCO Expansion(540 MW)	24.00	Hasdeo-Bango Project (Left Bank Canal, Main Power Canal RD 2970, Korba City)	3.60	10.65
9	Korba	NTPC Korba (2100+500+270) MW Expansion + BCPP BALCO 2870 MW	62+18+30=110.00	Hasdeo-Bango Project (Right bank Canal RD 1466M & 2250 M, Korba City)	3.60	10.65
10	Bilaspur	NTPC Sipat (2980 MW)	120.00	Hasdeo-Bango Project (Right bank Canal, RD 37950 M)	3.60	10.65
11	Korba	Shyama Prasad Mukharjee CSEB (East), 500 MW	21.00	Hasdeo-Bango Project (Right bank Canala RD 3800 M, Korba City)	3.60	10.65
12	Korba	CSEB (West) 500 MW	29.13	Hasdeo-Bango Project (Hasdeo-Bango Reservoir village Darri)	3.00	9.13
13	Janjgir Chapa	KVK Bio Energy	0.50	Hasdeo-Bango Project (Akaltara Branch Canal)	3.60	10.65
14	Korba	CSEB South (1000 MW)	40.00	Hasdeo-Bango Project (Hasdeo-Bango Reservoir, village Darri)	3.00	9.13
15	Korba	Balco Power (1200 MW)	32.00	Hasdeo-Bango Project – 12 MCM ; Hasdeo River- 16 MCM ;Tan River – 4 MCM	3.60	10.65
		<b>Total</b>	<b>431.491</b>			

Source: (Ministry of Water Resources, Government of Chhattisgarh, 2014)

The conflict has arisen because of the continuous denial of water for the rice crop in Rabi season. The department has said that it cannot supply water to irrigate paddy crop in Rabi season, it has promised to irrigate 173,100 ha land only if they cultivate crop other than rice as project proposal clearly mentioned that water will not be given for 'Summer paddy'(Chief Engineer, 2014). He said that they keep 2,448 MCM water for agriculture against its requirement of 1,840 MCM<sup>7</sup>. The departmental stand is based on the term summer paddy.

<sup>7</sup> This claim is not valid because he is counting carry over water in agricultural quota which cannot be given for agriculture as they have to reserve that much water in dam. If this is not the case, then total water allocation would be higher than the capacity of the dam.

So it is important to know what summer paddy means. There are three crop season in Chhattisgarh, autumn, winter and summer. Table 5 shows sowing and harvesting periods for these three crops in the case of rice.

**Table 5: Various seasons of Paddy in Eastern India**

Autumn		Winter		Summer	
Sowing	Harvesting	Sowing	Harvesting	Sowing	Harvesting
June- July	October- November	November- December	February- March	March- April	June-July

Source: (Directorate of Rice Development, 2002)

The Department of Water Resources is defining summer paddy as a Rabi crop, which is against the definition of summer paddy given by directorate of rice development as per above table. So, the department is terming the winter paddy as summer paddy by presenting facts incorrectly and thereby against the official policy, denying water to the winter paddy. It is clear from Table 3 that the department has given very less water for Rabi irrigation since 2006. The department used to provide water to irrigate winter paddy (Rabi Crop) before 1996<sup>8</sup> but they stopped providing water after that once new power and steel plants started operations in the area (Gowda, Brijesh & Mishra Anand, 2014, 26 June, Personal Interview). The continuous denial of water for Rabi crop has significantly impacted annual productivity.

However, there have been some years when the department has provided water for irrigation of rice in Rabi crop as shown in Table 3. The department states that sometimes farmers do not want to cultivate during Rabi so it cannot provide water but they do not have any explanation for why this is the case. The farmers explained that they sow rice if there is a good amount of rain in November and December during the retreating Monsoon (Gowda, Brijesh & Mishra Anand, 2014, 26 June, Personal Interview). In that case, there is higher assurance of provision of water by the Department for Rabi crop. So they only cultivate in Rabi season if they are assured that they will get water for irrigation and will get a return on their investment. The below table contains combined rainfall in Bilaspur, Janjgir-Champa, Korba and Raigarh during November and December.

<sup>8</sup> Could not be verified in the absence of official data

If I look at rainfall data for 2011-12 and 2012-13 and irrigation data for the same years respectively for Kharif we can see that the irrigational area has been higher in these two years in comparison to others while the case is reverse in 2013-14. It means the department gives water for Rabi irrigation in case of good rainfall in winters. So farmers get assured if they get good rains in November and December and they sow paddy in their fields, otherwise they are not sure whether they will get water for irrigation or not so they do not cultivate in the years when less rainfall is received in November and December. The Department of Water Resources does not supply water for irrigation of rice in the Rabi crop season even if the dam has sufficient water like in the case of 2008-09 and 2013-14. It means, it keeps water collected during monsoon for some other purposes which have not been explained by department. To justify its position the Department of Water Sources terms the winter paddy as summer paddy, resulting in the denial of water supply for the rice crop in winter.

**Table 6: Winter Rainfall**

S. No.	Year	Winter Rainfall (mm)
1.	2011-12	112.7
2.	2012-2013	116.1
3.	2013-14	55.4

Source: (Indian Meteorological Department, 2014)

The farmers clarify that there is no market for crops other than rice in the area. In the past, they tried to cultivate other crops such as wheat and gram but they could not get the price which can even cover their expenses. The other crops also have lower productivity in comparison to rice in the area (Gowda, Brijesh & Mishra Anand. 2014, 26 June, Personal Interview). Other than this, rice also provides food security for farmers which other crops do not. Moreover, wheat and barley (alternate crops suggested by state government) are not the staple food of the region. The absence of a market for other crops in the region is another major problem for cultivation. So they are not interested in cultivating crops other than paddy during Rabi season.

The clear causal relation cannot be established between denial of water for Rabi crop and allocation of water to industries, but local farmers observed that the denial of water had started after power plants were installed in the area<sup>9</sup>. Manish Rathore, a local activist,

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<sup>9</sup> This claim could not be verified by data.

disclosed that there is a nexus between government officials and industries. He claimed that companies are withdrawing much more water than what is being shown on paper. He mentioned that the companies have their own meters to measure water consumption. So, they can tamper them by bribing government officials. Government officials also keep extra water for industries so they do not face any problem and denies supply of water for agriculture as discussed above in the claims made of 'summer paddy'. The diversion of water from agriculture to industry is happening not on the paper but in reality. However, there is no official evidence which can substantiate these charges. The conflict has built around these two different positions of the Department of Water Resources and farmers of the four districts mentioned above. It is impacting the farmer's income as they do not cultivate their land during the Rabi season most of the time because of uncertainty of water for irrigation. The farmers claim though they may be true however could not be proven in absence of relevant data prior to 1996.

The Government has now signed contracts to provide water to four more companies from the Hasdeo-Bango Project. The combined allocation to these companies is 60.14 MCM. As stated above, the industry cannot get more than 441 MCM water from Hasdeo-Bango Project and 431 MCM has already being supplied to industry. It means more than 50 MCM water will be diverted to the industry from agriculture's share -this is only around 3% of the total water allotted to agriculture, but the problem is, it now opens the gates for water diversion from agriculture to industry in greater magnitudes in the future. The Table 5 shows the details of proposed water allocation to various industries.

**Table 7: Details of water allocation proposals to industry from Hasdeo-Bango**

<b>S. No.</b>	<b>Plant Name</b>	<b>Allotted Water (MCM)</b>	<b>Proposed Site</b>	<b>Current Situation</b>
1	BalcoKorba, 55 MTPA Aluminium Smelter Plant	7.50	By construction of an anicut in Dengur Discharge	Under process
2	Shree Shyam Warehousing & Power Private Limited, for their 10 MW biomass based proposed power plant	0.41	Pali Distributor of Janjgir Canal System near Banari Village	Water distribution is not possible. A letter has been sent to the plant
3	Vandana Power & Energy Limited (540 MW thermal power plant and 60 MW captive power plant for Sponge iron plant)	18+2.24 = 20.24	Water Supply from upstream of Hasdeo Reservoir near Jhora village	Water has not been allocated from new structures

S. No.	Plant Name	Allotted Water (MCM)	Proposed Site	Current Situation
			instead from proposed anicut Sarveshwar and Sarvmangala	
4	DheeruPowergen Pvt Ltd. Hyderabad for their proposed power plant	32.00	Water Supply from upstream of Hasdeo Reservoir near Chhuri Village instead from proposed anicut at Sarveshwar and Sarvmangala	Water has not been allocated from new structures
	<b>Total</b>	<b>60.14</b>		

Source: (Ministry of Water Resources, Government of Chhattisgarh, 2014)

The diversion of water from agriculture to industries is raising serious conflicts in the region. The continuous denial of water for the second crop even after the completion of the canal network has severely impacted annual agricultural productivity. It is directly impacting the income and livelihood of people dependent on agriculture. 70% population is dependent on agriculture in this region (Census, 2011), so a serious threat has been posed on their livelihoods especially to agricultural labourers as they are losing their employment during the Rabi season. A livelihood is necessary for living a life of dignity, so any serious impact on livelihood will impact quality of life also. The Supreme Court of India has declared water for life as a part of right to life with dignity (Deepak Bajaj Vs State of Maharashtra, 2008). It should also include right to water for livelihoods within right to live with dignity in a country in which the majority of population depends upon agriculture.

The other aspects of this conflict are related to corruption as a result of the nexus of state and corporate, environmental concerns and issues of land acquisition. The first of these issues is corruption where corporate are violating the conditions under which they got the clearances to setup power plants. The local officials are helping them by twisting the norms and deliberately misinterpretation of fact to favour industries. The case of Vandana Power and Energy Ltd. is one such case. Vandana Energy Ltd had earlier got permission to withdraw water from Hasdeo River by building anicuts 5 and 10 km downstream of Hasdeo barrage (Additional Secretary, Department of Water Resources, Government of Chhattisgarh, 2008). The conditions set out in the permission has said clearly that company

will invest 100% of the money required for building the anicut and will build a pipeline around 20 Km in length from each anicut to their plant (Additional Secretary, Department of Water Resources, Government of Chhattisgarh, 2008). The ownership of the anicut will remain with government. The company is also liable to pay compensation for land submerged or acquired for pipeline and it should not create any scarcity of water in the region (Additional Secretary, Department of Water Resources, Government of Chhattisgarh, 2008). According to an estimate, the company has to invest around 100 crores to withdraw water from Hasdeo (Chauhan, 2014). In 2010, the Department of Water Resources then granted the company access to withdraw water from a point 15 KM upstream of Hasdeo Barrage on the condition that it would compensate for the amount of water it will take from upstream of the barrage by releasing water from its anicut to be built by it downstream of the Hasdeo Barrage into the canal system (Secretary, Department of Water Resources, Government of Chhattisgarh, 2010). It would also have to bear all financial burdens for any new construction and recharging of water in Left or Right bank canal as per requirement set by the department (Secretary, Department of Water Resources, Government of Chhattisgarh, 2010).

On the surface there seems to be no problem with this agreement other than the issue that industries are getting more water than their allocated quota, but there are several more issues as well. Firstly, it has saved Vandana Energy Ltd. 100 crores<sup>10</sup> rupees by granting them access to water from a point upstream completely ignoring that the downstream anicut will never have 20.24 MCM water because of the lean flow of the river downstream of the barrage, the amount which Vandana will withdraw from upstream (Chauhan, 2014). The other fact which has been ignored is that the mean annual flow in Hasdeo river annually before Hasdeo-Bango is around 3,500 MCM and the dam stores around 2,894 MCM water. The rest of the water flows into the river for domestic needs in downstream and ecological needs. So construction of any such anicut would reduce the flow required for ecological purposes. The department has given approvals to construct anicuts having capacity of 40 MCM already, which means around 10 % reduction in environmental flows.

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<sup>10</sup>Vandana will save RS. 100 Crores as they need not to build a 25 KMs long pipeline to carry water from anicut in Sarvmangla and Sarveshwar. This cost includes cost of land acquisition for pipeline construction.

Vandana Energy Ltd has to date not deposited Rs. 60 crores as advanced charges to DWR for construction of the anicut<sup>11</sup>. It has been ensured perennial supply of water to its power plant without considering the above facts. The access to this water is given on the condition that they will replace water from their anicuts, but there is no clarity on what would happen if they have already used more amount of water from the barrage than they can replace? Secondly, by constructing an anicut downstream of the Hasdeo barrage water flow will be further reduced downstream of the anicut. There will be very little water for domestic and other uses downstream which is bound to make people's live tough.

The third issue which has been high-lighted in the media is the rampant corruption involved in water allocation to industries. The state has exempted Vandana from paying Rs. 12 crores as water charges (Nai Duniya, 2013). Vandana could not complete construction of work in four years, so it thereby did not take water from barrage (Nai Duniya, 2013). According to agreement between department of water resources and Vandana Power, it has to take water within four years otherwise contract would be void and it is also liable to pay water charge for 72 MCM water at RS 7/M<sup>3</sup> (As per rates applicable in 2011), even if it does not take water (Nai Duniya, 2013). The total amount of water charge for 72 MCM is around RS 12 crore which has been waived by state government (Nai Duniya, 2013).

There are many cases where similar events took place such as those of Lanco Amarkantak Case, BALCO expansion, CSEB expansion and Dheeru Powergen (Chauhan, 2014). These cases are clear indication of corruption in allocation of water to industries, where the interest of citizens has been ignored for the benefit of a private player. These actions of the state government not only give birth to the conflicts in the area but also put the livelihoods of many people at risk. Further, the government is completely ignoring the fact of water and air pollution produced by these power plants and their impact on the lives of people living in the area. The ecology of Korba town which has 14 power, aluminium and steel plants is being systematically destroyed. A doctor working in the area has disclosed that a lot of patients are having a number of health issues related to respiration, allergy, eye ailments and many more because of pollution by power plants in the region.

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<sup>11</sup> Cost of construction of anicut in Hasdeo river is about 60 crores.

## Manifestation of Conflict

Recent manifestations of conflict occurred in May, 2012 and March, 2013 when the villagers of Chhuri, Dhanras and Jhojra demonstrated against Vandana Power and chose not to handover the rights to their land for the construction of pipeline. The Gram Sabha had passed a resolution that they will not give their land to any company for a pipeline or any other purpose.

The demonstration against Vandana Power and the Department of Water Resources for giving permission for the construction of another anicut in the river took place over 7 days in March 2011, which also got support from the villages downstream. Initially, villagers were aware only about the construction of the anicut but when the company started building other structures at Jhora village upstream of Hasdeo Barrage they protested against this too. Their fear was that the barrage will not have water in summers if the company started taking water upstream. The demonstration was called off once officials of DOWR promised that they will look into the issues and will resolve them, but the conditions have not changed much since. The construction could not be completed mainly due to problems of land acquisition for pipeline construction and continual protests at the site (Deshbandhu, 2011). The demand of protestors was to stop the construction of other anicuts to provide water for industries such as Lanco, BALCO and CSEB. A similar protest had also happened when Lanco Power had built an anicut to provide water to its thermal power plant. The department of water resources however still denied any violation of rules in providing water to industries or conditions set in the contract between the company and the department (Deshbandhu, 2011).

There are several letters that have been written to the governor and chief minister with facts requesting them to direct DOWR to provide water for irrigation in Rabi season and other livelihoods (Annex 1). The state government has not taken heed of these letters and it has been clearing proposals of power companies to withdraw water from the Hasdeo-Bango Project.

The chief Engineer of Hasdeo-Bango Project has said that all the issues with farmers will be resolved in an amicable manner and emphasised that the farmers are not getting water because of seepages in the canal system not because of industry (Dubey, Anil K., Chief

Engineer, Hasdeo-Bango Scheme (2014, July 8). Telephone Interview). He said that they will give water to farmers if they are ready to cultivate crops other than rice, but he rejected the claims of farmers downstream and declared that the Hasdeo River has enough water to flow even after recharging the anicut.

### **Stakeholders**

The main stakeholders in this conflict around Hasdeo-Bango Project are farmers, villagers downstream, industries and the Department of Water Resources. There are some NGOs like SARTHAK, SROUT etc, who are also working on the issue. Lakshmi Chauhan of Sarthak has filed cases against industries such as BALCO for violation of rules. They are continuously advocating for farmers valid quota of water from the dam and to reduce diversion of water to industry. The farmers came out to protest on their own and not through any registered formal organization, they are however the main party in this conflict. The other problem is that farmers are distributed in three districts, and they have not organised themselves into one force till now.

The key persons, who are involved, are Lakshmi Chauhan (Secretary, Sarthak, Korba), Manish Rathore (Sarthak, Korba), Rajendra Jaiswal (Local Correspondent, Deshbandhu) and Satyaprakash Jaiswal (SROUT, Korba). The Chhattisgarh Kisan Sabha is now playing a role in organising farmers into a single front, so they can put up their arguments strongly in front of the state.

The industry and farmers have opposing stands regarding water allocation. On one hand officials are blaming farmers for sowing water intensive paddy during the Rabi Season, on the other hand farmers are saying that water is being allotted to industries at their cost and they have been cultivating paddy in the Rabi season since the late 1980s (Chauhan, 2014). They are only now facing problems because of the industries.

## A Way Forward<sup>12</sup>

The conflict has arisen because of increasing water demand from the industrial side and the denial of water for rice irrigation during the Rabi season. The state should sit together with industry and farmers and resolve the conflict by removing the unnecessary blockades. We are making following suggestions to resolve the conflict in a just manner.

- The Department of Water Resources should clear the confusion between summer paddy and Rabi crop and should fulfil its promises or communicate clearly to the farmers that rice cultivation is not possible in changed conditions and should provide incentives to cultivate crops other than rice during Rabi season.
- The state government should develop market for crops other than rice for Rabi season. It should also develop adequate storage capacity for agriculture produce to increase its shelf life. Then farmers can sell their produce when the market is good for them.
- The canal system needs large repairs due to seepages; this will save a lot of water which can be used for agricultural purpose. Secondly, water will reach the tail of the canal system, where it does not currently reach.
- Farmers should be encouraged for using water saving practices for cultivation of paddy. They should be trained by state and companies as part of their CSR program to use water friendly irrigation technologies.
- The companies should provide subsidized power to the farmers for their agricultural and domestic, but this power should not be used for ground water exploitation use which will increase their profitability.
- These companies should also train farmers to process crops, so that farmers can get a higher price in market and can increase their income level.
- Typically a 200 MW coal based thermal power plant needs 5M<sup>3</sup> water to generate 1 MW power (Technical Study: Best Practices in Water Usage in Coal Based Thermal Power Plants, 2013). This demand of water by coal based thermal power plants can be reduced by using alternate technologies without changing much in design. The power companies should not be allowed to use water intensive technologies while setting up power plants.

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<sup>12</sup> This is a suggestive framework which is based on field experience.

- The state government should consult local communities and take them in confidence before giving clearance for building new structures such as anicut in the River. They should be informed and their concerns should be resolved in the best possible manner.
- The Government of Gujarat has reduced water losses because of evaporation by covering the canals with solar panels. This has generated extra power also. The Chhattisgarh Government can follow the same thing, this extra power generation capacity will compensate for the requirement of thermal power generation capacity, which will reduce demand for water further.
- The state government should not promise water for industries without looking at the reality of the situation. This would help avoid diversion of water for irrigation to industry which generates conflict.
- In the cases where more water is being given to an industry beyond the fixed quota the state should carry out a detailed social impact assessment and implement strategies to mitigate the negative impacts on livelihood of people.

These suggestions if implemented may reduce the chance of conflict between industry and agriculture. This would be a sustainable solution for both industry and agriculture.

## Annex

### 1. Letter from Laxmi Chauhan, Sarthak to Chief Minister

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