CHAPTER: 2

ROLE OF WATERSHED MANAGEMENT IN PROMOTING SUSTAINABLE AGRICULTURAL DEVELOPMENT
The Indian State has continued to espouse the strategy for rural development without seriously questioning its ultimate aim endeavoring to articulate the principles that must guide these developmental efforts. Indian planning since independence has not been able to take a comprehensive perspective and give an integrated approach for the development of this crucial sector of Indian economy and society. In other words, the state has by and large failed to arrest the decline of socio-economic development, as experienced by the majority of its population. However, these limitations are not only due to the inability of the State’s indecision, but also stems from the unlimited patience and silence demonstrated by the common man in India. As a result, the primacy of economic growth has significantly determined the importance, nature and extent of State’s developmental initiatives in rural India.

In recent years things have been changing for the better. The state has taken several pro-people initiatives, like efforts to strengthen local governance, empowering people with the right to information act, introducing people’s participation in the management of natural resources among many other initiatives to correct the imbalances which were set in motion by the first five year plan.

In this chapter we analyze the role of watershed programs in strengthening the rural economy and society primarily based on agriculture and allied activities.

The chapter is divided into two sections. Section: 1 discusses the Indian State’s planning strategy with special reference to its impact on the agricultural and rural population as a whole. Then it attempts to explain the concept of watershed, and its relevance in the Indian context, especially in the semi-arid regions of Rajasthan. Section: 2 explains and analyzes the NWDPRA project under study, at both the policy and implementation levels.
SECTION: 1

About 70 per cent of India's population lives in the villages. Here, the problem of inadequate and unremunerative employment is very severe. The majority of rural Indians draw their sustenance from productive biomass and biomass related activities. Thus, they are directly and/or indirectly dependent on agriculture. Inspite of its diminishing share in GDP, the economy as a whole continues to vitally depend on agriculture.\(^1\) Frequent failure of monsoons, recurrent droughts and increasing population are chief among many other factors which spell misery for 70 per cent of the population almost every year, on a sustainable basis.

Agriculture in India offers a considerable potential for achieving self-sufficiency in food and for eradicating poverty. And, this study focuses the analysis on water as a resource meant solely for irrigation purposes to promote sustainable agriculture and livelihood for this 70 per cent of the population.

Such an analysis must necessarily be preceded by an attempt to understand the significant role of State Planning since independence, to resolve the issue of ensuring sustainable agricultural growth.

The norms against which, development planning and policy will be evaluated are the following:

1. The extent to which the developmental process is effective in guaranteeing social justice. This norm is based on a rationale that any pattern of economic growth, which fails to arrest a decline in the standard of living of the majority of population, is unjust.
2. The extent to which the state's institutions and programs encourage public action.

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\(^1\) Quibria, M. G. (ed) (1993), Rural Poverty in Asia: Priority, Issues and Policy options (Hong Kong: Oxford University Press).
These value judgements which are consonant with more than one social philosophy, are based on the conviction that anything contributing to extreme inequality in standards of living is morally unacceptable. As R. H. Tawney says,

Civilization is a matter; not of quantity of possessions, but of quality of life. It is to be judged, not by the output of goods and services per head, but by the use which is made of them.  

These norms reflect the growing consensus, in the circles of development literature to take a much more inclusive view of the nature of economic development, which find expression in the writings of Dasgupta, Adelman and Morris, Dreze and Sen, Evans, Ostrom among many others.

Debate on The National Development Strategy to be Adopted by Post-1947 India:

In the early 1950s the central problem of Indian development was identified in terms of initiating a self reliant and sustained growth process in a poor, backward economy, plagued with large structural inequalities - that had remained virtually stagnant for a long time, during the colonial period. These inequalities were not adequately condoned, and economic growth was made the centerpiece of the development process.

Two distinct alternatives for carrying out this project of development were considered by the leaders of the national movement. They are discussed below in some detail.

The first was the Gandhian alternative that never saw the light of the day.

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The period between 1914 and 1947 has frequently been characterized as the phase of mass nationalism. In this instance, as in many others, Gandhi intervened in political discourse to transform it and, indeed, he developed and deployed the existing discussion in a fresh direction.

Gandhi's writings and thinking provide a detailed vision of an alternative path of development and show how to attain it. The spirit of non-violence permeated his thought in both the political and economic spheres. This helped him in understanding and then forcefully advocating the existence of a harmonious relationship between economic progress and environmental conservation.

Gandhi was primarily interested in the drastic reorientation of the present political and economic structures to one based on small self-sufficient communities. The latter form of structure, he said affirms faith in a healthy wholeness of life, a comprehensive process that is visible to one and all. He emphasized the inter-relatedness of objects, the need to achieve harmony, the inter-relatedness of economy and environment and the cycles of production, rather than on consumption and development that denudes and depletes the environment.

Gandhi was concerned with the development of society as a whole. He considered the fulfillment of material needs as only one, though the most important aspect of total development. He did recognize and gave significant place in his writings to the need for satisfying material wants. His concern was rooted in the primacy given to economics, in the taking of all policy decisions relating to the development of the people, by the present civilizations. He believed that this results in the exclusion and subsequent deterioration of spiritual and mental values among the people.

Therefore, he advocated the production of these consumer items by the villages and small-scale industries. This would benefit the millions of people in rural India, who could utilize their six months of idle time in earning from other sources of employment. As he observed:
I do not believe that multiplication of wants and machinery contributed to supply them, is taking the world a single step nearer its goal. I wholeheartedly detest this mad desire to destroy distance and time, to increase animal appetites and go to the ends of the earth in search of their satisfaction. Apart from its moral and psychological values, limiting human wants to a few simple necessities produced by the people in their own homes and not in large factories has the advantage that:
(1) The goods thus produced would be more beneficial to human health.
(2) This system of production would allow poor villagers to be free of exploitation by becoming as self-sufficient as possible and thereby would enable them to regain human values.
(3) The most important of all, being non-violent in character, it would be friendly to nature and environment.  

Thus, Gandhi was not against machines per se. He firmly believed that mechanization is beneficial when the

Hands are too few for the work. It is an evil when there are more hands than required for the work.  

He considered

An improvement in a small machine, which adds to the efficiency of cottage industries and which a man can handle without being its slave is to be welcomed.  

Undue mechanization leads to human alienation. Therefore, through the message of charkha, khadi and village industries he sought to integrate economics, politics and technology with ethics. He believed khadi represented human values while the mill cloth represent metallic values.

He explained

Granting for the moment that the machinery may supply all the needs of humanity, still it would concentrate production in particular areas so that you would have to go in round about way to regulate distribution, whereas, if there is production and

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5 Ibid., 3.
6 Ibid., 3.
distribution both in respective areas where things are required, it is automatically regulated, and there is less chance for fraud, and none for speculation.7

Gandhi was simply advocating a world built on renewable resources against one built on non-renewable resources. He wrote

This is because the former cooperates with nature and bears the sign of life and therefore can last, while the latter robs nature and bears the sign of death and therefore cannot last.8

Therefore, he advocated the adoption of decentralized village self-sufficient units, as this would also check the violence, which forms the basis of capitalist mode of production, i.e. exploitation of the 'surplus value' of human labor.

The essence of this debate is well understood by Roy and Tisdell, when they write,

In the Gandhian plan, the peasant had been given the place of honor and pride because with cottage factories and workshops surrounding his fields, he would symbolize an economic and socio-political order based on non-violence, democracy, justice and simplicity. The chief aim of such a plan was not the multiplicity of wants and accumulation of comforts and luxuries, although a minimum standard of living was to be assured to all human beings. The basic principle on which the success of such a development plan hinged were simplicity, non-violence, sanctity of labor and human values.9

However, the views that mattered were the ones held by Nehru and other Congress leaders. The Bombay Plan that was a forerunner of Indian five-year plans was strongly opposed by Gandhi as it advocated centralism and large-scale development.

During the lifetime of Gandhi, his views were plainly rejected by Indian intellectuals as impractical and inappropriate as a basis for the

7 Ibid., 7
8 Ibid., 6.
9 Ibid., 8.
country's planning strategy. In 1938, National Planning committee was constituted with Nehru as the chairperson.

This leadership, along with the vast majority of the professional intelligentsia of India, had little doubt about the central importance of industrialization for the development of a modern and prosperous nation. Yet the very political strategy of building up a mass movement against colonial rule had required the congress to espouse Gandhi's idea of machinery, commercialization and centralized state power as the curses of modern civilization, thrust upon the Indian people by European colonialism...This was, until the 1940s, a characteristic part of the Congress rhetoric of nationalist mobilization. But now that the new national state was ready to be conceptualized in concrete terms, this archaic ideological baggage had to be jettisoned.10

Nehru was impressed and obsessed with the Russian socialist experience and Fabian thought. Fabian ideas, which influenced Nehru, were rooted in the traditions of English utilitarianism and classical economic thought. And, in contrast to French socialism, which was revolutionary, English socialist tradition was reformist.11 These blended well with the Gandhian views on non-violence, thus giving Nehru's perceptions an unchallenged supremacy. The Gradualist approach also blended well with the then ruling Indian elite, which was the product of the English educational system.

Nehru's obsession with big and grandiose projects greatly influenced the pattern of planned development. In this process labor intensive, resource conserving technology and environmentally prudent development programs were duly neglected.

For Nehru, the khadi industry was a transitional affair. However, he continued to support the Gandhian concept of non-violent development, as he believed that we could not attain this ideal by conflict or violence.

This explains India's adoption of democratic political system along

10 Chatterjee, Partha (1997), "Development Planning and the Indian State", in (ed) T.J. Byres, The State, Development Planning and Liberalization in India (Delhi: Oxford University Press).
11 Bose, Arun (1989), India's Social Crisis (Delhi: Oxford University Press).
with centralized socialist economic system of production and distribution.

The problem of achieving sustainable growth was solved by the Nehru-Mahalanobis strategy, on which the Second five year plan was framed. This strategy introduced a significant diversion in the emphasis on State expenditure from the agricultural sector towards enhancing the rate of capital accumulation by raising the share of the basic, heavy and machine building industries.

This strategy was not aimed at enhancing potential employment opportunities for the people as well as the supplies of consumer items needed immediately by the people. This need prompted Mahalanobis to suggest a 'transitional strategy', which provided for the promotion of cottage, and small-scale industries. These industries were expected to solve the immediate problem while giving a 'no tension' space for allowing the investment of scarce resources for long-term economic growth.

The roots of poverty were identified in the non-availability of goods to meet the requirements of a rapidly growing population. Hence increasing production was made the primary task.

The task of distributing this growth was left to the concept of the 'trickle down' process to handle gradually. The degree and nature of impact of the occupational, sectoral, inter-class, inter-regional differentiation on growth itself were treated as secondary or non-existent concerns which would automatically dilute and vanish once the target was achieved. The allocations for social services were regarded as 'consumption expenditure' with the connotation that they represented a drain on the economy, rather than as 'productive investment'.

Therefore what the common Indian got were words, vague promises and noble gestures, which served to maintain the legitimacy of the democratic system.

To sum up, the Mahalanobis strategy was devised for an economy which was predominantly agricultural, with about half of the country's national income deriving from the primary sector. This sector was also
supporting ¾ of the country's workforce.

Even the neo classical economists believe that if industry is to develop successfully in India, simultaneous efforts must be made to ensure that agriculture grows faster on a sustainable basis.

**First Step: Structural and Institutional Changes Introduced:**

The two main objectives for the introduction of these institutional changes in the agricultural sector were:

1. To abolish the intermediaries between the government and the tillers.
2. To impose ceilings on the ownership of landholdings and distribute the surplus land to the landless tillers.

The abolition of Zamindari rights was one of the major components of the land reform measures taken up and effectively completed, during the first decade after independence. Legally, at least it changed the predominantly feudal character of land relationship in the agrarian sector. According to Rao,

The intermediaries were abolished within a few years after independence and the actual tillers accounting for about the 40% of the cultivated area became the owners.\(^\text{12}\)

But its potential impact was limited in many ways. In the first place, the abolition of intermediaries was basically a reform of revenue administration rather than a measure of land re-distribution.\(^\text{13}\) Further, there was not much reduction in the economic power of Zamindars, because with one or two exceptions, in all states even this legal measure was achieved by paying handsome compensation to those who claimed the traditional right of ownership. Thus, the only change effected was in the composition of the property of the erstwhile owners', making it more


\(^{13}\) Kurien, C. T. (1978), Poverty, Planning and Social Transformation (Bombay: Allied Publisher).

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liquid and thereby, conferring upon them more effective potential control over resources, in general. As a result of reforms, a new class of rich peasants with control over land, links with industries, power over poor peasants and agricultural laborers alike and with enormous possibilities to extend their sway into the political realm as well -- came up.\textsuperscript{14}

Another attempt to reform ownership and control of land - was the launching of the "Cooperative Village Management" (CVM). This was thought of as a via media between private individual ownership on the one hand and socialized state ownership or the other - retaining the advantages of the former and incorporating the potential benefits of large-scale operations of the latter. The Planning Commission pinned its hope on the ultimate growth of CVM, whereby the relative status of agricultural workers would improve and fuller employment would become available. How CVM would offer employment to the landless workers was not quite clear.\textsuperscript{15} Moreover, this was rather a naive concept, based on a utopian notion of a village and plain ignorance, or unwillingness to see the truth about how a village community functioned.

Due to pressures from the conservative elements (who were supported by senior Congress leaders like Rajagopalachari), the opposition to CVM gained momentum, on the grounds that it was a prelude to collectivization, and that, in turn, can be the beginning of totalitarianism.\textsuperscript{16}

However, in order to give the impression that structural transformation was not totally abandoned, attention was turned from cooperative farming to land ceiling legislation. Ironically, the draft outline of the First five-year plan had already rejected the proposal to put a ceiling on existing holdings on the grounds that peaceful and


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democratic change is likely to be the most lasting. Moreover, Nehru was reluctant to push through the land ceiling reforms, as he feared that such a measure could undermine the 'umbrella' character of the Congress party. Still, the Central Government provided the guidelines in this regard, the legislations were to be enacted by the state government, but neither of them were seriously interested in getting them through.  

As such, the land ceiling efforts were not very successful. Moreover, due to increasing population, there was rapid sub-division of large landholdings.

According to A Rudra, the importance of agrarian reforms should not be underestimated, as is clearly evident from the fact that the need for socio-economic reconstruction as a measure to reduce poverty was recognized and emphasized in the Lahore session. It was, however, felt that vested interests in agriculture would be disarmed, cornered and finally liquidated by socialist forces growing on the foundations of the heavy industries, which were going to be set up in the public sector. Furthermore, according to Prof. Dandekar,

There was no lack of understanding of the condition of the people - i.e. they had neither sufficient work to do nor adequate income to live on. Nevertheless, it was evidently politically expedient to leave them alone and to let them hang on, as they had done for decades, until they found alternative employment.

Economic planning in India was not initiated in the aftermath of a socialist revolution, but was the product of an anti-colonial revolution. Thus, seen in terms of the political logic of 'passive revolution' (A. Gramsci), the strategy followed during the Nehruvian phase, was precisely, one of promoting industrialization without taking the risk of agrarian political mobilization.

19 Dnadekar, 1994: 94.
20 Rao, J. Mohan, "Agricultural development under State Planning", in (ed) T. J. Byres, The
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Kurien\textsuperscript{21} points out, that it is possible to argue that the decision to continue along the capitalist path, after independence, was taken more by default than by design, as there was always a pragmatic compulsion to ensure that there was an uninterrupted increase in production to meet the needs of a large population that was at very low levels of living and was increasing in numbers at an alarming rate.

The choice of a strategy of gradual transformation was based on the consideration of the perceived possibilities of using political power through democratic processes based on universal adult franchise. It was strongly argued that if the political transfer of power from alien rulers to the people of the land could be brought about through orderly processes, it should be possible for the majority of the people to have their economic rights also recognized through similar process, especially since the state was on their side in the new set up.\textsuperscript{22} But history has shown how totally wrong this prognosis was, based as it was on an incredibly naive theory of state.

**Second Step: Technological Changes Introduced:**

Towards the mid-60s, there was a major shift in the orientation of the state policies in the agricultural sector. Growth assumed a clear priority over any redistributive concerns, as the new strategy marked the political origins of agrarian capitalism. This new shift was based on a changed perception that it was technological rather than institutional constraints that were impeding the agricultural growth. The new technology raised the level of profitability for farmers to invest significantly in agriculture.

Apart from the introduction of High Yielding Varieties of seeds for wheat and rice, public investment in agriculture was stepped up significantly. Agricultural growth under the Green Revolution was

\textsuperscript{21} Kurien, C. T., 1992.

\textsuperscript{22} Ibid.
avowedly a program of land augmenting technical change involving the use of bio-chemical and mechanical inputs. This program did generate the necessary conditions for meeting the food needs of the poor, by maintaining the growth rate of food grains, just above the rate of population growth. The food grain production increased from a low level of 74.2 million tones in 1966-67 to 99.5 million tones in 1969-70 and further to 108.4 million tones in 1970-1.²³ However, its impact on the poor in terms of income - mobility and consumption was indirect and limited.

Availability of land base was a necessary condition for access to direct benefits from the new technology - this ruled out the virtually assetless poor from receiving the benefits. Secondly, even though the biological - chemical technology was neutral to scale in principle, unequal access to two major complementary inputs, namely - water and credit ----prevented the small and marginal farmers from adopting yield-raising technological change. Thirdly, the possibilities of increased employment and rise in real wages that could have resulted from the rise in land productivity, were more than offset by demographic pressures, high and unbalanced level of mechanization -- leading to a faster rise in labor supply relative to demand. ²⁴Finally, in several regions the success of this strategy itself increased the vulnerability of the poor, who lacked the purchasing power to obtain fine grains - production for the market, overlooking the benefits of coarse crops and thereby adversely affecting the capacity of the poor to feed themselves. Moreover, green revolution never took off in the regions with abundant labor. Furthermore, this production strategy resulted in serious ecological and environmental damage.

Rural development and prosperity through irrigation has been a dominant strategy in Indian Planning since the beginning of the era of

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Five year plans. India has earned the reputation of being one of the world's greatest dam builders. As Saleth shows that we have been successful in almost quadrupling our irrigation potential from 22.6 mha in 1950 to 86 mha as of 1993-1994 and making India the number one in the world in terms of the existing facilities.\(^\text{25}\)

However, the potential impact of dams on the environment, ecology and humans has never been taken into account seriously, while taking such decisions. After independence, multi-purpose dams were envisaged to provide hydro-electricity for industrial development and irrigation for agriculture, to achieve the urgent and sensitive task of food self-sufficiency. The Green Revolution further strengthened this trend in Indian Planning, as is evident from the following table 2.1.1.

**Table 2.1.1**

**Plan-wise Financial Expenditure in Different Segments of Irrigation.**

<table>
<thead>
<tr>
<th>Plan Period</th>
<th>Major and Medium Irrigation (state)</th>
<th>Minor Irrigation (institutional)</th>
<th>Command Area Development</th>
<th>Total (Billion Rs.)</th>
<th>Share of Irrigation in total Plan expenditure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Plan (up to 1951)</td>
<td>3.76</td>
<td>0.66</td>
<td></td>
<td>4.42</td>
<td>22.55</td>
</tr>
<tr>
<td>First Plan (1951–56)</td>
<td>3.80</td>
<td>1.42</td>
<td>0.19</td>
<td>5.42</td>
<td>11.59</td>
</tr>
<tr>
<td>Second Plan (1956–61)</td>
<td>5.76</td>
<td>3.28</td>
<td>1.15</td>
<td>10.19</td>
<td>11.88</td>
</tr>
<tr>
<td>Third Plan (1961–66)</td>
<td>4.30</td>
<td>3.26</td>
<td>2.35</td>
<td>9.91</td>
<td>14.95</td>
</tr>
<tr>
<td>Annual Plans</td>
<td>12.42</td>
<td>5.12</td>
<td>6.61</td>
<td>24.16</td>
<td>15.31</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>Fifth Plan (1974-78)</td>
<td>20.79</td>
<td>5.02</td>
<td>4.80</td>
<td>2.15</td>
<td>32.76</td>
<td>14.28</td>
<td></td>
</tr>
<tr>
<td>Annual Plans (1978-80)</td>
<td>73.69</td>
<td>19.79</td>
<td>14.38</td>
<td>7.48</td>
<td>115.29</td>
<td>10.55</td>
<td></td>
</tr>
<tr>
<td>Sixth Plan(1980-85)</td>
<td>111.07</td>
<td>31.18</td>
<td>30.61</td>
<td>14.48</td>
<td>187.34</td>
<td>8.56</td>
<td></td>
</tr>
<tr>
<td>Seventh Plan (1885-90)</td>
<td>26.35</td>
<td>8.36</td>
<td>6.76</td>
<td>3.09</td>
<td>44.56</td>
<td>7.64</td>
<td></td>
</tr>
<tr>
<td>Annual Plan (1990-92)</td>
<td>28.24</td>
<td>8.44</td>
<td>6.74</td>
<td>2.83</td>
<td>46.25</td>
<td>7.14</td>
<td></td>
</tr>
<tr>
<td>Eight Plan (1992-97)</td>
<td>224.15</td>
<td>59.77</td>
<td>**</td>
<td>25.10</td>
<td>309.02</td>
<td>7.12</td>
<td></td>
</tr>
<tr>
<td>Annual Plan(1993-94)</td>
<td>38.41</td>
<td>12.16</td>
<td>**</td>
<td>4.44</td>
<td>55.01</td>
<td>5.49</td>
<td></td>
</tr>
</tbody>
</table>


Notes: * = Negligible

** = Not Available

This table clearly indicates that, although the investment under all the forms of irrigation systems has been increasing, the share of the irrigation sector as a whole in the total plan expenditure has witnessed a steady decline from 14.28 per cent during the Fifth Plan period to 5.49 per cent during the Annual Plan of 1993-1994.

The negative effects of this form of allocation and continued emphasis on the major and medium projects in the initial plan period can be seen in the form of increased water logging and salinity problems.
in the several parts of the country. Further, the trend of regional imbalance in the state's growth pattern was given a green signal, though by default. Even the Rajasthan Government has continued to emphasize on multi-purpose and inter-state valley projects, major and medium irrigation projects, up till Eighth Five Year Plan.

Thus, the adoption of the new agricultural strategy highlighted the incapacity of the Indian State to translate the developmental vision of its leadership into concrete outcomes. There have been powerful social forces in India, that pressed for industrialization as well as for the technological growth of agriculture (among these, Charan Singh and BKU were prominent).

Is there a trade off between growth and its distribution?

The answer to this question is difficult, because if there is no or less growth then what will we distribute and among who?

Soon after independence India faced the problem of food scarcity alongwith other consumer items. The obvious response of the planners to this problem was to advocate a strategy facilitating and ensuring increased production and productivity. Since a major attribute of poverty is material deprivation, it stands to reason that goods needed by the poor must increase in availability. But it does not mean that growth by itself can suffice to solve the problem of poverty and other deprivations, as our planners believed. For access to these goods depends substantially on what Amartya Sen has called "entitlements."

Economic growth does have an important instrumental role in enhancing human capabilities (though in the limited sense of growth of real income per head), depending on the nature of that growth. Thus, for instance, the question arises as to -- how employment intensive it is, and whether the economic gains from growth are channeled into remedying the deprivations of the most needy?

In India, the economic growth process has been unsuccessful in this respect, partly due to wrong choices made in the product technology
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combinations, in both the industrial and agrarian sectors, and more importantly because of the insufficient recognition that economic growth was no more than a means to some other objective. In other words, it was not adequately recognized that while goods and services are valuable, they are not valuable in themselves. Their value rests on what they can do for people, or rather, what people can do with them?

For instance, hunger is caused by a lack of income, not of food supply. As Prof. Dandekar\textsuperscript{26} explains, the income is distributed in such an inequalitarian fashion that those who are hungry do not have the purchasing power to increase their food grain consumption.

On 9\textsuperscript{th} May 2001 the apex court of India sought a response from the Central and six State governments to the allegation that a large number of starvation deaths were occurring when the government's godowns were overflowing with food grains. On a PIL filed by the People's Union for Civil Liberties, the court issued notice to the Central government and Food Corporation of India, besides the governments of Orissa, Rajasthan, Chhattisgarh, Maharastra, Gujarat and Himachal Pradesh. It is ironical and important to take note of the fact that while the food grains stock of the government has been steadily rising in the 1990's, the offtake of the food grains under public distribution system, especially that of wheat, has witnessed a decline. The offtake of wheat declined from 8.83 million tons in 1991-1992 to 5.00 million tons in 1999-2000. It is even more startling that during April 2000 to December 2000, when there was such a clear need for low-price food grains to reach the weaker sections, the public distribution system's off take declined further. The off take of wheat during these nine months was only 2.72 Mt. The offtake of rice during these nine months was 5.75 Mt. compared to 10.95 Mt. during the previous one year.\textsuperscript{27}

\textsuperscript{26} Dandekar, 1994.

\textsuperscript{27} Dugra, Bharat (2001), "Empty Stomachs, Packed Godowns", The Times of India, May 18; viii.
These adverse effects clearly indicate the continuing inability of the planners to understand and address the most crucial question, i.e. Development towards what end?

It would be too simple to assume that the planners did not understand the problem, as Dandekar\textsuperscript{28} also explains. While communicating with the state officials at the Central, State, District and Block levels it has become evident to me that although they are all well aware of the flaws present in the various rural developmental programs, at both the policy and implementation levels, however either they are themselves too helpless to raise their voices or have become complacent. The complacency has emerged, with the knowledge of a simple fact, that they are in the position of authority with the State's power backing them up, whether their actions suit the needs and interests of the common man is largely not their concern, as they are not answerable to the People of India. Therefore, India has become a land of legislations. We have laws on every conceivable issue and still social justice remains a mission impossible. This is the reason why governments come and go and situations do not change much in our country.

The reason for the irresponsible attitude among the state officials is largely determined by how the people are represented in the public policy making scenario, as it significantly influences how policies are made and also their content. Tony Beck explains this argument that,

If the poor are represented as passive, irresponsible, incapable or greedy then the external intervention will probably takes a top-down approach. If on the other hand, they are viewed as active contributors in the making of their societies, external intervention may take a quite different approach.\textsuperscript{29}

Thus, this study attempts to argue that how the people are represented in the public policy making scenario determines how policies are made and also their content.

\textsuperscript{28} Dandekar, 1994.
\textsuperscript{29} Beck, Tony (1994), The Experience of Poverty: Fighting for Respect and Resources in Village India (United Kingdom: Intermediate Technology Publications); 2.
The indirect contribution of the Green Revolution to equity through food security and the decline in the relative prices of food grains was perhaps more significant than its direct impact by way of labor absorption in agriculture. Because of the slow growth of employment in the primary sector, the employment and income generated under Poverty Alleviation Programs (PAPs) had to be stepped up. These employment programs with the income generation programs under Integrated Rural Development Program seem to make up for about half of the deficiency in employment generation in the agricultural sector.

The fifth five year plan, translated Mrs. Gandhi's political slogan of 'Garibi Hatao' into economic terms by initiating the strategy of 'growth with equity'. The increasing hardships of the people were to be addressed separately through specific targeted policies.

Since this phase, the major focus of rural development has been primarily on PAPs, while institutional restructuring, adult education, compulsory primary education and public provision of easily accessible health services, have been on the agenda of rural development in their own right as well as in their instrumental role in poverty alleviation -- they have not received as much political support and legitimacy as PAPs (especially, programs meant for the rural poor).

The solution to the problems of unemployment, poverty and income inequality was not integrated with the changes in domestic production and expenditure patterns built into the plan. PAPs were separated from mainstream planning, to be financed partly through budget allocations and partly through bank loans. The interventionist strategy is an attempt to correct the structural consequences without altering the structural characteristics, as it was made clear in the Fifth plan. To quote A. Rudra,

Any drastic redistribution at the present level of income,
Role of Watershed Management in Promoting Sustainable Agricultural Development

even if it were feasible, is bound to make the mobilization of savings for investment far more difficult. Moreover, such a measure will reduce the income of skilled workers, supervisors, managers, entrepreneurs and other groups -- who have a crucial role in developing the economy. 30

According to Ranadive, the argument thus was that,

The benefits of development would trickle down to the poor and the unemployed through a multiplier process, whose effectiveness could be enhanced by removing the obstacles to competition and mobility of labor; should this not be adequate, such social objectives should be sought through direct state action. 31

The acceptance of the special schemes, during this phase, projected the consensus that was emerging between the techno-economic view of development and the constraints of the emerging political environment. Consequently, this phase marked the beginning of populist politics, in which the state and vested interest groups have started using the issues related to the marginalised sections, for their political and economic gains in a more prominent manner. According to C T Kurien,

This phenomenon, is certain to remain an integral part of India's political processes, for as long as both the rulers and the ruled regard politics as a benefit sharing process rather than as a change inducing process. 32

Poverty alleviation programs, like IRDP and JRY, can be successfully used as potent instruments to transform the political process and initiate changes in the structural characteristics of the economy. As Kurien argues,

They communicate the principle that even the humblest sections of society have rights. They announce that the administration must be responsive to the needs and rights of

30 Rudra, Ashok (1978), The Basic Needs concept and its implementation in Indian Development Planning (ILO, ARTEP); 15-16.
32 Kurien, C. T. (1992), Growth and Justice: Aspects of Indian Developmental Planing (Madras: Oxford University Press); 45.
the people, thereby introducing an element of accountability into the administrative system and if energized -- would constitute useful pressure from below to loosen some of the rigidities of the system and ensure that growth becomes more responsive to social needs.  

To sum up the discussion so far:

Economic development in India since 1951 has involved undue stress on industrial development, technological change resulting in the considerable environmental variation. The process of technological change and development by extensive use of non-renewable resources, population growth and greater penetration of market forces has led to detrimental changes in the environment and in the structure of rural societies.

The environmental problems related to agriculture have not received as much attention in accordance with the important role they play in Indian social and economic life. Until the late 1970s, increasing food production was the main focus of agricultural developmental policies. It was only during the early 1980s, that the seriously emerging environmental issues related to agriculture were recognized as issues requiring policy interventions.

Natural resources support the livelihoods of millions of Indian poor. These resources also provide Indian industries with much needed raw materials. Therefore, they are as important to the poor as they are to the non-poor sections of the population. Nature is the only valuable capital that ought to be conserved by humans, only if they wish to survive on earth for generations to come. However, India's development experience indicates that nature has been treated otherwise.

The professed objective of the Green Revolution was to eliminate food scarcity and mass starvation deaths. However, the Indian States of Orissa, Rajasthan, Gujarat, Bihar, Andhra Pradesh, Madhya Pradesh

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33 Ibid., 47-48.
Role of Watershed Management in Promoting Sustainable Agricultural Development

have been reeling under drought for the past couple of years. Today, the Green Revolution is in reality proving to be the greatest threat to the food security.

Francine Frankel begins the preface of her famous work, titled "India's Green Revolution: Economic Gains and Political Costs", analyzing the impact of the technological changes in the five Indian states, with an apt observation, which I quote here. She says,

The phrase 'green revolution' has all the qualities of a good slogan. It is catchy; it simplifies a complex reality; and most importantly, it carries the conviction that fundamental problems are being solved. Agriculture, it suggests, is being peacefully transformed through the quiet workings of science and technology, reaping the economic gains of modernization while avoiding the social costs of mass upheaval and disorder usually associated with rapid change.

Frankel's study draws the following conclusions. Firstly, she observes that "almost all the classes of cultivators have experienced some improvements in the yield and income from the I.A.D.P approach." This trend is particularly true in the case of the wheat-growing regions. The "second major point, which also appears certain, is that the gains of the new technology have been unevenly distributed." She further writes,

It is clear that the HYV program is being introduced into a setting where economic disparities have already been substantially sharpened by the differential capacity of small and large farmers, as well as tenants and owners, to sustain the capital outlays on land development.

Further on this issue, Vandana Shiva has forcefully argued that,

While the increase in productivity was the primary objective of the Green Revolution in terms of resources and energy, the productivity actually declined. The increase that was

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37 Ibid., 191.
38 Ibid., 191.
39 Ibid., 193-194.
achieved in the early phases was at the level of financial returns. In fact the motive force for the Green Revolution technology package came from profits. However the ecology of the Green Revolution demanded increasing costs of inputs and resulted in decreasing profits for the farmers of Punjab. Agricultural income stagnated or began to decline. In less than two decades the Green Revolution had become financially and ecologically un-viable.\footnote{Shiva (1992), The Violence of Green Revolution (Delhi: The Other India Press); 197.}

The myth of the success of the Green Revolution was generated to sanctify the construction of dams, chemical and fertilizer companies which implies intensive irrigation and is power intensive. This is evident from the fact that despite the success of the Green Revolution in achieving almost near sufficiency in food production in 1987 - 1988 only 34 % of the total area under food grains was irrigated. This explains the support these energy-intensive projects enjoy from the Transnational companies and other vested interests while our blinkered agro-economists merely give them a supporting hand resulting in the parasitical growth of centralized urban-industrial economies.

The state's policy on water resource management is only one instance, though a startling one, highlighting the validity of the above arguments.

The government's intervention in the provision of irrigation water to the farmers has been of two kinds:\footnote{Agarwal, Anil and Sunita Narain (ed), Dying Wisdom: Rise, fall and potential of India's traditional water harvesting systems. Delhi: Centre for Science and Environment; 1997.}

1. Construction of major and medium scale structures.
2. Support for the construction of minor projects like construction of the public kunds.

Government has been investing heavily in providing water resources to the people. However, these investments are primarily concentrated on large projects that are politician-friendly, administration-friendly and contractor-friendly. Thus, resulting in enormous waste of public money continued water scarcity, endemic
poverty, unemployment, and underemployment and forced migration of farmers and artisans to overcrowded cities. Moreover, this style of funding promotes an essentially state-centric rather than community-centric style of governance.

State management of water resources was not unknown in the past. Then its role was confined to the provision of funds and technical assistance. And, local communities played a crucial role in their construction and operation.42

In this context, it has often been argued that in the name of providing economic and social development, the post independent state appropriated a very large part of the economic surplus, and deployed it in bureaucratically directed economic activities. These activities mainly promoted the interests of the 'affluent classes' giving rise to political economy problems.

**The Eighth Five Year Plan: A Watershed in Indian Planning.**

This change in emphasis is also clearly visible in table 2.1.1. The Eighth Plan suggests that environmental objectives are almost synonymous with human development. It is for the first time that Indian planning has officially recognized that environment, ecology and development must be balanced to meet the needs of the society, in both urban and rural India.

India, under the Rao government ten years ago, changed its economic policy direction, while embracing the structural adjustment policies. The World Bank's economists are correct in pointing out that in some cases improved pricing of natural resources and elimination of subsidies can prove to be environmentally beneficial. On the other hand, the smaller public sector is likely to mean that public funds for the support of conservation projects and government departments associated

42 Ibid.
with them are likely to be scarcer. Furthermore, such reforms will not eliminate market failures of environmental significance but may cause these to become more prevalent.

The Government and the Planning Commission are now more conscious of the need for designing and implementing environmentally prudent developmental policies than they were in the early 1980s. While actions that have been undertaken may be small; they are nonetheless significant steps taken to minimize the adverse impact of developmental strategy on nature and humans.

This emphasis in the irrigation sector is clearly evident from the following table 2.1.2.

**Table 2.1.2**

Purpose wise Number of Projects Sanctioned And Financial Allocations made

_(Till 31, March 1998)_

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Total Number of Projects sanctioned</th>
<th>Total Financial Allocation approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Irrigation</td>
<td>54</td>
<td>845.96</td>
</tr>
<tr>
<td>Medium Irrigation</td>
<td>138</td>
<td>1252.83</td>
</tr>
<tr>
<td>Minor Irrigation</td>
<td>15987</td>
<td>1695.10</td>
</tr>
<tr>
<td>Watershed Management</td>
<td>144</td>
<td>212.32</td>
</tr>
</tbody>
</table>


The emphasis on the development of watershed projects is one such positive step to which we will now turn our attention.
Unfinished Tasks Taken Up:

According to the Planning Commission's draft report on the development of rainfed areas, the benefits of agricultural development since 1951 have been confined to regions of assured irrigation and adequate infrastructure facilities. The rainfed areas, which now constitute 65 per cent of the net cultivated area, have lagged behind.43

The availability of irrigation water has been a major factor for the success of the Green Revolution and is therefore mainly confined to the irrigated lands.

According to Virmani,

Crop yields per unit area in rainfed agriculture is 25 to 50 per cent of those harvested in irrigated agriculture. Frequent crop failures occur in rainfed regions, so productivity is low. Rural poverty and migration of labor to the cities and well-endowed regions is high. So there is seldom any incentive for farmers to invest in rainfed agriculture.44

Because of this lop-sided growth in agriculture, the Indian Council of Agricultural Research has noted a major slowdown in food production from irrigated agriculture due to the smaller expansion of irrigated area and land fatigue. Rainfed farming has a distinct place in Indian agriculture. It occupies 67 % of the cultivated area, contributing 44 % of the food grains and supporting 40 % of the population.45

Moreover, it is important to note that the nature of rainfall is completely different from that of the middle latitude countries of Europe. India does not receive rainfall all through the year. It is largely concentrated during four months of the year. Then too, rainfall does not occur daily. Parts of Rajasthan have in the past received twice their

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43 As quoted by Virmani (1997), "Watershed based approach", The Hindu Survey of Indian Agriculture; SIA-11.
44 Ibid., SIA-11.
average rainfall in a period of just two days. But, due to lack of effective means of harvesting this rainwater, it is wasted. According to PR Pisharoty, one of India’s leading meteorologists,

There is almost no area in the country where the rainfall is less than 100mm annually and even this is sufficient to meet the survival needs of the people, provided it is harvested properly and where it falls.46

Irrigation in arid and semi-arid regions like in Rajasthan typically involves harvesting and storing rainwater for cultivation purposes.

Several such experiments are going on in different parts of the country, which authenticate this argument. For instance, Anna Hazare has changed his native village into a green oasis in an otherwise parched drought prone area. Every slope in the village is afforested and every nala bunded. The result is a green village capable of dealing with the areas recurrent droughts than the neighboring villages.

It has been observed that the rural employment generation programs like Integrated Rural Development Program and Jawahar Rozgar Yojana are inconsistent with the spirit of multi-level planning and that is why they do not advocate integrated development of the village.47 This argument is also well supported and advocated by CH Hanumantha Rao, N. S. Jodha and Chopra and Kadekodi in their writings. 48 Hanumantha Rao writes,

The enormous potential for integrating the employment objective with ecological and economic development is evident from the fact that the reclamation of about 40 million hectares of wasteland for bio-mass production can generate over 50 million persons-years of work, but this potential has not been fully exploited, so far.49

46 Agarwal and Narain: 1997; 314.
47 Singh, Nayanika (1996), State Welfare in India: An analysis of IRDP and JRY. M. Phil. dissertation (unpublished) (Delhi: Centre for Political Studies, Jawaharlal Nehru University).
49 Rao, 1992b; 2604.
These arguments underscore the importance of studying watershed programs. It is important to note that the degradation of land is one of the problems that are hostile to both sustainable agriculture and ecology. Out of the total geographical area of 329 million hectares, 175 million hectares is affected by one form of degradation or the other.50

POST GREEN REVOLUTION WATERSHED MANAGEMENT:

Rainfed farming is not a new phenomenon. Much ancient archaeological evidence is available about traditional systems that existed in early days. However organized governmental developmental efforts were initiated only in the 1930s.51

The watershed is a piece of land that drains off water at a common point. Watershed Development Projects aim at an integrated treatment of watersheds and increasing the productivity of the region in a sustainable manner through soil and water conservation. According to Rao,

Watershed development has been conceived basically as a strategy for protecting the livelihoods of the people inhabiting the fragile ecosystems experiencing soil erosion.52

By the end of the 1970s, it became clear that water was the most critical factor and unless rainwater is managed scientifically, the future of rainfed crops would continue to fluctuate. Therefore, in the early 1980s, during the period of the Sixth Five Year Plan, the Department of Agriculture and Cooperation launched a pilot project for the propagation of water conservation / harvesting technology in rainfed areas, in 15 states. The Department of Rural Development also adopted this scheme and in 23 districts the Drought Prone Areas Program was launched. 53

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50 Ibid.
51 Agarwal and Narain, 1997.
Thus, the central objective was water conservation and water harvesting. Good performance was obtained and the need for promoting a simple and low cost water management technology was highlighted.

On the basis of accumulated experience, the National Watershed Development Program for Rainfed Agriculture was launched during the Seventh Plan in the 99 selected watersheds of the country. These watersheds demonstrated models of successful crop production. As per project design, non-arable lands were to be developed by funds provided from other schemes. The funds did not come at the right time. It was therefore decided that single window financing and a task force approach were needed for sustainable development of the entire rainfed areas. It was against this backdrop that the National Watershed Development Project for Rainfed Areas (NWDPRA) was re-structured and launched during 1990-1991 in the light of the experiences gained and lessons learnt. The following section discusses this project in greater detail.

But before moving on the section: 2, let us understand the experiences and lessons learnt on the basis of which NWDPRA Project was launched. They were as given below:

1. During the process of delineation of watersheds, diagnosis of problems, development of solutions and their application in the field, major attention was concentrated on program content, technical specifications of different conservation measures and the attendant costs, project implementation, supervision, monitoring, etc., in the delineated watersheds. Somehow the relationship of the watershed area with the total problem was neglected. In fact, project content received total attention and the program context was relegated to the background. As a result, in almost all the projects, of Watershed Management, the area coverage has been microscopic due to which the national objectives of the control of siltation reservoirs, mitigation of floods and drought proofing of the vulnerable areas, have still to be


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achieved. As a matter of fact, a perspective plan for treating the entire problematic rainfed areas in the foreseeable future, have to develop those objectives.

(2) Lack of people's participation was another shortcoming of the earlier approaches. It was well recognized that Government and Non-Governmental organizations alone could not cover the vast rainfed areas. The only way to accelerate the pace of the watershed development programs is to invoke the willing participation of the people in the program. Under the NWDPRA project a well-conceived methodology has been adopted for this purpose.

(3) In the early stages of watershed development a sectoral approach was adopted. The inter-sectoral linkages were completely ignored causing unintended distortions. However, these distortions have been rectified in the NWDPRA project.

SECTION: 2

The Government of India in 1990-1991 commenced the revised NWDPRA project as a centrally sponsored program. The scheme is 100% centrally funded, comprising of 75% of grants and 25% of loans.

It took up the challenge to implement a massive project costing US $ 500 million, covering 3.7 million hectares in 2500 micro-watersheds of 500 to 5000 hectares each, in 25 states and 2 union territories of the country. The coverage of the program extended to at least 10,000 villages, holding at least 15 million people and 7.5 million cattle in 115 agro-climatic zones, including mountainous uplands, waterlogged low lands, saline coastal areas and marshy plains, extremely high monsoon areas and rain deficient areas.56

Approach and Strategy of NWDPRA:

The approach and strategy of the project are primarily based on the twin concepts of Integrated Watershed Management and Sustainable Farming Systems. Sustainable Farming Systems development encompassing agriculture, forestry, horticulture, animal husbandry and household production processing enterprises in various combinations constitute a holistic approach.

Thus, the approach and strategy of the project is characterized by the following aspects:\(^{57}\)

1. Treating arable lands, non-arable lands and drainage lines as a single geo-hydrological unit for project planning and implementation.

2. Combining conservation measures and production systems in a relationship of "means and ends", respectively. In other words, conservation measures are planned and implemented to support the pre-determined land use.

3. Dissolving departmental barriers and constituting multi-disciplinary teams of officials in agriculture, forestry, horticulture, hydrology, animal husbandry, etc. at various levels of policy making, project planning, supervision, implementation and monitoring, etc.

4. Creating awareness and organizing individuals and groups through formal and informal institutions so that the people perceive watershed management as their "felt need", and start it as a "people's movement".

In fact detaining, retaining and using the rainwater as it falls and where it falls is the first maxim of this project. This project relies on water conservation technology built upon the accumulated wisdom and skill of the people.

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Role of Watershed Management in Promoting Sustainable Agricultural Development

The salient features\(^{58}\) are:

1. In-situ moisture conservation.
2. More reliance on vegetation—herbs, shrubs and trees to control erosion from flowing and falling water.
3. Use of bulky organic matters to improve the moisture holding capacity of soil, store water and its slow release to support plant growth during dry spells.
4. Adoption of traditional sunken devices (dug outs) for water and silt harvesting to primarily recharge ground water and dug wells so that water is available for use in winter and summer months which are by and large dry months.
5. Reduction of the velocity and volume of water going outside the micro-watershed and conservation of surface flow (run off) in to sub-surface flow.
6. Adopting diversified farming systems.

Implementation of the Project:

Detailed guidelines were issued on every aspect of watershed management including survey and project preparation, cost norms, laying of nurseries and demonstration, management of common property resources, livestock management and fodder development. These guidelines were published under the caption “WARASA”.

Realizing that a watershed cannot be developed in a viable manner unless there is active participation of the people in the development process, the project relies heavily on the watershed team comprising of five mitra kisan\(^{59}\) (contact farmers) from each village.\(^{60}\) Thus, a

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\(^{58}\) Ibid.

\(^{59}\) Every project has its own terminology, which are infect one of the ways present with their policy formulators to make the project more people-friendly. As names do not ensure positive or negative performance.

\(^{60}\) Ibid., 12-14.
watershed comprising of three to five villages has at least 15 to 25 mitra kisans. From each village of a watershed, five friendly farmers are selected. Of these five mitra kisans, two have to be women, one has to be landless person, one person has to be the artisan and one has to be the enlightened farmer. The mitra kisans of all the villages combined together form the village watershed committee (VWC).

According to the guidelines issued for the functioning of the VWCs in Rajasthan, the number of members were increased from 5 to 7 or 11, varying with the population of the respective villages. This change was made operational from 1994. This is the reason that even in Andheri Deori, the eighth five year plan watershed (in chapter: 5) all the nine village committees had reported 7 members, when this field study was conducted in the year 2000. This guideline details both the manner in which these committees should be constituted and the manner in which they should function. The guidelines make provisions for the inclusion of 1/3rd of women as members. It also makes reservation for the inclusion of members from the S.C., S.T. as well as one family in the village, who is primarily dependent on animal husbandry as a source of living.

The VWC acts as a representative for the watershed community. The guidelines clearly stipulate that all the state officials could participate in the meetings of the committee, however they do not enjoy the right to vote or veto the decisions taken by this committee. This committee selects their chairman and a secretary. All the positions in VWC are to be freshly filled after two years.

The various responsibilities of this forum are as given below:

1. To organize from time to time different training courses for farmers, livestock rearers and artisans.

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62 Ibid.
(2) To help formulate different program contents from time to time and to resolve conflicts.

(3) To evaluate the effectiveness and impact of different components of the program under NWDPRA and organize suitable forums to resolve various conflicts faced by watershed communities during the implementation of the project.

(4) To review the progress in the implementation of watershed development programs periodically, and to bring the shortcomings arising there from, to the notice of higher authorities for satisfactory solution.

(5) To render needed assistance and guidance in the formulation of self-help thrift groups to accelerate the pace of implementation of different programs through the active participation of such groups. For implementation of various activities relating to development and management of common property resources and household production systems, self-help groups of beneficiaries are being constituted activity-wise. Each self-help group also has a chairman and a secretary for the operation of funds, and together with the watershed team they generate thrift and deposit savings in the banks. The banks extend loans to such self-help groups to the tune of four times the savings deposited by them in the bank, to enable the groups to augment their activities. Non-Governmental agencies are also actively involved in many areas for providing assistance in forming the self-help groups of beneficiaries and organizing the training program.

According to the Government of India’s guidelines,

These mitra kisans would also serve as important link between scientists and farmers from their villages and will receive training at the training centers. They would then further disseminate the same to other farmers.\(^{53}\)

\(^{63}\) GOI: 1992, 14.
Training is imparted to these mitra kisans before crop of Rabi and Kharif is sown. The next year, another 15 to 25 mitra kisans are given training. Thus, over the five year project period, every watershed has 75 to 125 trained mitra kisans of the watershed. They are all trained to understand the concept of watershed management and farming systems, talk of their needs and prepare a project. The state government clears this project, if government of India for concerned agro-climatic zone in accordance with the model project approves it.

After the project is cleared, funds are placed with the watershed team through the state government and the watershed development team with the active participation of the farmers and the landless people of the watershed takes up work.

Arable lands, non-arable lands, drainage lines including every bit of land that needs to be treated is taken up with the people's participation. The beneficiaries get paid in the form of incentives for improving their own lands, laying demonstrations, building checks, sunken structures, etc.

Funds are also available for developing common property resources by forming self-help groups. Emphasis is also placed on promoting indigenous traditional knowledge of understanding the importance of organic farming, integrated pest management and integrated nutrient management by realizing the importance of cattle and fisheries, of bees and friendly insects in the ecology and how these promote growth.

Farming practices right from preparation of land to treatment of seeds, taking care of the crop and post harvest technology, are taught to the farmers by the watershed development teams and trained friendly farmers.

The project relies on low cost measures so those farmers on their own are able to replicate them. That is why the water conservation measures are vegetation based coupled with loose boulder checks and impounding type water storage structures. Affordability, replicability and
sustainability are built into the project.

While the landholders receive incentives to improve the production and productivity of their land, the landless are given assistance for managing common property resources and for taking up household income generating activities.

**Project Components:**

The approach being adopted under the project comprises of conservation measures as "means" and production system as "ends". Various components of the project are:

**Basic Activities:**

1. Survey and Projection.
2. Establishment of nurseries.
3. Training to farmers, landless laborers, farmwomen and field functionaries.

**Field Activities: arable lands**

Conservation Measures:
1. Vegetative filter strips in place of diversion drains.
2. Contour vegetative hedges.
3. Contour vegetative hedges supported by trenches / ridges and furrows.
4. Gully control measures.
5. Contour cultivation.
Role of Watershed Management in Promoting Sustainable Agricultural Development

Production System:
(1) Crop demonstration.
(2) Agro-forestry.
(3) Dry land horticulture.
(4) Organic farming systems.
(5) Kitchen gardening.
(6) Household production system.

Field Activities: non-arable lands

Conservation Measures:
(1) Vegetative filters strips in place of diversion drains.
(2) Live fencing.
(3) Vegetative contour hedges with furrows.
(4) Gully control measures.

Production Systems:
(1) Over seeding of grains and legumes.
(2) Planting of shrubs.
(3) Planting of trees along drainage lines.

Field Activities: treatment of drainage lines
(1) Bank stabilization mostly with vegetative measures.
(2) Treatment of upper reaches through live check dams, brush wood checks, loose boulder checks and small dugouts.
(3) Treatment of middle reaches through earthen structures, support run off management dug out ponds.
(4) Treatment of lower reaches through limited number of dug out structures.

Livestock Management
(1) Castration of scrub bulls.
(2) Breeding by natural service.
(3) Promotion of cultivated fodders production.

**Target vs. Achievement during the Eight five-year plans:**

Till March 1997, Government of India accorded 115 model watersheds. Whereas, 2554 micro- watersheds projects were approved by the State Level Sanctioning committees in various states. The physical achievements of the project during the Eighth Plan Period are given in the following table 2.2.1

**Table 2.2.1**

*Physical Status (hectares) of NWDPRA Project implemented during the Eighth Five Year Plan period.*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>State and Union Territories</th>
<th>Target of Eighth Five Year Plan</th>
<th>Watersheds taken up by the states</th>
<th>Area covered under Watersheds</th>
<th>Actual area developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Andhra Pradesh</td>
<td>197150</td>
<td>94</td>
<td>191949</td>
<td>176939</td>
</tr>
<tr>
<td>3.</td>
<td>Assam</td>
<td>60200</td>
<td>110</td>
<td>104973</td>
<td>70221</td>
</tr>
<tr>
<td>4.</td>
<td>Bihar</td>
<td>137200</td>
<td>191</td>
<td>98978</td>
<td>23189</td>
</tr>
<tr>
<td>5.</td>
<td>Goa</td>
<td>3075</td>
<td>4</td>
<td>3808</td>
<td>2100</td>
</tr>
<tr>
<td>6.</td>
<td>Gujarat</td>
<td>208025</td>
<td>168</td>
<td>334261</td>
<td>294414</td>
</tr>
<tr>
<td>7.</td>
<td>Haryana</td>
<td>4600</td>
<td>5</td>
<td>18725</td>
<td>20282</td>
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<tr>
<td>8.</td>
<td>Himachal Pradesh</td>
<td>14000</td>
<td>58</td>
<td>37240</td>
<td>37240</td>
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<tr>
<td>10.</td>
<td>Karnataka</td>
<td>250600</td>
<td>85</td>
<td>357607</td>
<td>485109</td>
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<tr>
<td>11.</td>
<td>Kerala</td>
<td>54025</td>
<td>114</td>
<td>88276</td>
<td>88276</td>
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<tr>
<td>12.</td>
<td>Madhya Pradesh</td>
<td>458375</td>
<td>385</td>
<td>749641</td>
<td>660202</td>
</tr>
</tbody>
</table>

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Thus, during the Eighth Plan the watershed program was targeted to cover 2.8 million ha of rainfed area under NWDPRA, as indicated in the table above. However, the end of the Plan has treated an area of 4.30 million ha spread over 2554 micro watersheds treated for an expenditure of about Rs. 9780 million. According to Sinha, one of the highlight achievements of NWDPRA project during the Eighth plan period includes the setting up of nearly 2000 Rainfed Agricultural Awareness Generation
Centers, 3000 composite nurseries, organizing orientation and training courses to benefit of about one million project beneficiaries.

Since 1991-1992, the scheme has been extended to cover all blocks in Rajasthan, where less than 30% of area is irrigated. According to the Annual Report of the Watershed Development department of Rajasthan for 1995-1996, 204 watersheds in 190 panchayat samities in the state have been covered under the scheme. The cost of the project is Rs. 159 crores, covering an area of 6.47 lacs ha in Rajasthan. Upto 1995-1996 an area of 442370 ha has been covered under the program and a expenditure of Rs. 11398.23 lac was incurred. At the national level, Rajasthan is second best in release of funds as well as area sanctioned for the project.

The NWDPRA project in Rajasthan State is divided into five circles for administrative convenience. They are Ajmer circle, Jaipur circle, Jodhpur circle, Kota circle and Udaipur circle.

The activity wise performance of the Ajmer circle is given in the following table 2.2.2.

**Table 2.2.2**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Activities</th>
<th>Unit</th>
<th>Physical Progress</th>
<th>Financial Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Survey projection</td>
<td>Ha.</td>
<td>47200</td>
<td>57.84</td>
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<tr>
<td>2</td>
<td>Training</td>
<td>No.</td>
<td>4</td>
<td>12.70</td>
</tr>
<tr>
<td>3</td>
<td>Establishment of Nurseries</td>
<td>No.</td>
<td>10</td>
<td>30.28</td>
</tr>
</tbody>
</table>

66 Ibid.
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Units</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Establishment and management Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Research and innovative support</td>
<td></td>
<td>6.41</td>
</tr>
<tr>
<td>6.</td>
<td>Establishment of Barani Chetna Kendra</td>
<td></td>
<td>3.87</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>111.10</td>
</tr>
<tr>
<td>7.</td>
<td>Vegetative Filter Strips</td>
<td>No.</td>
<td>797</td>
</tr>
<tr>
<td>8.</td>
<td>Contour Vegetative Hedges</td>
<td>Ha.</td>
<td>29167</td>
</tr>
<tr>
<td>9.</td>
<td>Repairs and other Measures</td>
<td>No.</td>
<td>1833</td>
</tr>
<tr>
<td>10.</td>
<td>Dead Furrows, Contour cultivation</td>
<td>No.</td>
<td>857</td>
</tr>
<tr>
<td>11.</td>
<td>Other Activities</td>
<td>No.</td>
<td>1780</td>
</tr>
<tr>
<td>12.</td>
<td>Gully Control Measures</td>
<td>No.</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>209.42</td>
</tr>
<tr>
<td>13.</td>
<td>Crop Demonstrations</td>
<td>No.</td>
<td>1918</td>
</tr>
<tr>
<td>14.</td>
<td>Agro-forestry</td>
<td>No.</td>
<td>246913</td>
</tr>
<tr>
<td>15.</td>
<td>Dry land Horticulture</td>
<td>No.</td>
<td>123084</td>
</tr>
<tr>
<td>16.</td>
<td>Organic Farming System</td>
<td>No.</td>
<td>2007</td>
</tr>
<tr>
<td>17.</td>
<td>Homestead Garden</td>
<td>No.</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>No.</td>
<td>Area/Measure</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>18.</td>
<td>House-hold Production Measures</td>
<td>333</td>
<td>3.52</td>
</tr>
<tr>
<td>19.</td>
<td>Vegetative Filter Strips</td>
<td>14472</td>
<td>3.32</td>
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<tr>
<td>20.</td>
<td>Contour Vegetative Hedges</td>
<td>13124</td>
<td>131.40</td>
</tr>
<tr>
<td>21.</td>
<td>Gully Control Measures</td>
<td>976</td>
<td>9.84</td>
</tr>
<tr>
<td>22.</td>
<td>Over seeding of Grasses</td>
<td>7310</td>
<td>42.00</td>
</tr>
<tr>
<td>23.</td>
<td>Live Fencing</td>
<td>342674</td>
<td>48.13</td>
</tr>
<tr>
<td>24.</td>
<td>Planting of Shrubs</td>
<td>229700</td>
<td>7.57</td>
</tr>
<tr>
<td>25.</td>
<td>Planting of Trees</td>
<td>976353</td>
<td>49.66</td>
</tr>
<tr>
<td>26.</td>
<td>Bank Stabilization</td>
<td>256906</td>
<td>46.68</td>
</tr>
<tr>
<td>27.</td>
<td>Live check Dams</td>
<td>1505</td>
<td>7.13</td>
</tr>
<tr>
<td>28.</td>
<td>Brushwood Dams</td>
<td>75</td>
<td>0.34</td>
</tr>
<tr>
<td>29.</td>
<td>L.S.C.D.</td>
<td>3198</td>
<td>38.52</td>
</tr>
<tr>
<td>30.</td>
<td>Dug Out Sunken Ponds</td>
<td>315</td>
<td>12.83</td>
</tr>
<tr>
<td>31.</td>
<td>Loose Stone Structure</td>
<td>884</td>
<td>16.28</td>
</tr>
<tr>
<td>32.</td>
<td>Earthen Structure with Vegetation</td>
<td>969</td>
<td>12.74</td>
</tr>
</tbody>
</table>
Role of Watershed Management in Promoting Sustainable Agricultural Development

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.</td>
<td>Runoff Management Structure</td>
<td>377</td>
<td>15.14</td>
</tr>
<tr>
<td></td>
<td>Lower Reaches</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>34. Dug out Sunken Structure</td>
<td>111</td>
<td>20.48</td>
</tr>
<tr>
<td></td>
<td>35. Gabian Structure</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>36. Removal of Nala Congestion and others</td>
<td>18</td>
<td>2.77</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>172.91</td>
</tr>
<tr>
<td></td>
<td>Livestock Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>37. Gopal Yojana</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>38. Fodder Development</td>
<td>1244</td>
<td>10.84</td>
</tr>
<tr>
<td></td>
<td>40. Population Control</td>
<td>2069</td>
<td>5.38</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>23.21</td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td></td>
<td>873.42</td>
</tr>
</tbody>
</table>


The above table, which details the achievements of the Ajmer circle, includes districts such as Ajmer, Bhilwara, Rajsamand, Nagur and Tonk. As both the watershed regions under analysis falls within Ajmer circle, that is why only the performance of Ajmer circle has been presented in the above table. During 1995-1996 an expenditure of Rs. 86.99 million was incurred on works against annual target of Rs. 102.50 million covering an area of 31242 ha. This represents the most feasible area for watershed development and a series of success stories are witnessed. Development works in 43 watersheds were taken up in this
A typical rainfed farmer derives sustenance partly from his own cultivated land and partly from non-arable land in the village. Arable land is the private land owned and cultivated by the farmers. Activities were taken to improve the introduction of new crop varieties so as to improve the cropping pattern and cropping intensity. The total financial expenditure on enhancing the production system has been Rs. 64.86 lacs. The striking part of the achievement of the Ajmer circle is the attention given to the works on non-arable land has been considerable. The project undertook all the activities like live fencing, planting of shrubs and trees. This shows that benefits delivered were well balanced and have the potential of yielding positive results.

**Constraints Observed in the Implementation of NWDPRA:**

In the initial years, the pace of implementation was slow due to preparatory time taken in putting the project on the ground such as identification of the project sites, preparation and sanctions for the project, and the making of institutional arrangements for it.

In some states, the slow progress was due to the following factors:

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(1) Time taken to bring about attitudinal change in the field
functionaries to unlearn the conventional approach of structural
conservation measures and relearn the affordable and replicable
farmer's conservation practices, which is the essence of
restructured NWDPRA.

(2) Delay in the preparation of projects and their approval by the state
level sanctioning committees.

(3) Non-release of funds by the states and union territories to the
implementing agencies at the departmental level negatively affects
the project at the micro level. The payments are delayed to the
project beneficiaries causing loss of interest in the works. It also
negatively affects the daily wageworkers.

(4) Multifarious activities taken up under the project.

(5) Although the guidelines are eloquent about the importance of
participation and the need for implementing staff to learn from
communities and so on. The guidelines do not have anything that
would make someone down the line to adopt the processes except
a change of attitudes brought about by the guidelines. The
incentives are far higher in bilateral programs, which also employ
non-governmental organizations. By the hiring of these
organizations specific resources are devoted to participatory
methods, unlike in NWDPRA project.

Modifications Suggested during Ninth Plan:

The cardinal features as well as major program measures including
their activities / sub-activities (numbering 45) would continue during the
Ninth Plan also, as they were executed during the Eighth Plan. It is
proposed to introduce certain need-based modifications in NWDPRA for
the Ninth Plan in the form of revision of cost norms, introduction of
flexibility, greater research project, review of livestock components,
Role of Watershed Management in Promoting Sustainable Agricultural Development

enlarged role of non governmental organizations and strengthening of the staff and logistic support. The modifications that have been taken up under the project are detailed below:

(1) It has been laid down that from the level of Rs 3500 to Rs 4000/ ha for plain areas with less than eight per cent slope and from Rs 5000 to Rs 5500/ha. For areas with more than eight per cent slope.

(2) It has also been provided for that the States will be allowed great deal of flexibility in terms of the choice of technology suited to their specific agro-climatic conditions. There will be flexibility to do need-based adjustment within the main framework of the program in terms of allocation of resources between components under field and basic activities. And, the diversion of funds will not exceed more than five per cent from the basic to field activities and not the other way round.

(3) Adoption of holistic Eco-system approaches.

(4) Agro-machinery custom hiring-cum-servicing center, which could lease out service.

(5) Vocational training to educated unemployed rural youth.

(6) Efficient use of water through construction of recharge wells, sprinkler irrigation, etc.

(7) Introducing the system of giving awards for outstanding field functionaries and farmers.

(8) Raising more number of plants under agro-forestry / dry land horticulture. The Project proposes to allow about 30 plants/ha from the existing level of 10 plants \ ha to support cluster plantation of horticulture and agro-forestry activities in selected pockets of watershed with favorable soil depth and moisture regime to augment the production of fruits, fuelwood, fodder and fiber.

(9) In view of the increased emphasis on the watershed concept and the vast number of projects being implemented not only under NWDPRA

but also as funded by various international agencies, it has been proposed to share and consolidate the experiences.

(10) It has also been proposed that in order to avoid duplication, the breeding program through artificial insemination and natural services will be discontinued during the Ninth Plan. However, the other livestock related components of the program will continue like fodder cultivation and cattle health care.

(11) During the Eighth Plan period sunken structures were proposed and constructed in the drainage line treatment areas, which did not act as water harvesting structures. The Ninth Plan proposes farm ponds especially for the drought prone areas. The objective of these farm ponds is to help support life saving supplemental irrigation's in the lean period.

CONCLUSION:

The government has accorded the highest priority to the holistic development of the rainfed areas. According to the systematic evaluation studies launched by the government, people's participation in the program is increasing day by day. People from the adjoining areas of existing watersheds have started exerting pressure on the Government to introduce similar programs in their areas---and this is a positive step indicating how successfully this program is being implemented. This does not imply that the project is being perfectly implemented, as indicated in this chapter. All that is being asserted that its performance in relation to most of the other state funded and implemented projects is better. For this, the credit goes both to the State's project implementing agencies as well as the project beneficiaries, as both of them have understood the importance of these kinds of works. Further, this understanding is clearly visible in the views reflected by ML Mehta, the Chief Secretary, Government of Rajasthan, when he said—

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69 As quoted in GOI (1995).
The fallow lands of Rajasthan are the areas where millions of poor are fighting their last battle for survival. NWDPRA represents a major instrument for their upliftment. Agro-Forestry and improved moisture conservation practices are the primary thrust areas of the project along with breed improvement of cattle.\(^{70}\)

Despite this understanding, the attitudes of administrative arrogance continue to persist and create undue conflictual situations between the state and society, as this recent instance reveals.

On 4th July 2001, Rajasthan Patrika reported that Rajasthan irrigation minister, Kamla Beniwal, had told a meeting of MLAs that the irrigation department has the authority over every drop of water and that anybody who transgresses this right of the state will be severely dealt with.\(^{71}\)

The most disheartening point here is that this not a new and an isolated incident. It continues to creep up, as and when the local administration decides to demolish a water harvesting structures set up by the locals to meet their water requirements, on the flimsy rationale that the structure is technically incorrect. Such incidents create an environment that makes it hard for the members of society to trust and work with the state officials and vice versa.

However, these negative incidents should also not overshadow the instances, where state as well as societal actors have been working towards reaching an understanding, and are working together. These incidents are few and are important to study. The state can not be wished away. As Palit has said in the context of joint forest management project,

It is increasingly evident that without the commitment and cooperation of forest department communities, the forests of

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\(^{70}\) GOR (1996), on the back cover of the Annual Report.  
\(^{71}\) Agarwal (2001), "Row over Ruparel", Down to Earth, July 31; 4.
Role of Watershed Management in Promoting Sustainable Agricultural Development

India will remain in jeopardy.72

Similar conclusions were drawn from the analysis of the indigenous village level institutions managing and conserving natural resources in Sariska Tiger Reserve, Alwar.73 It was clearly observed that this community effectively conserved their natural resources for six years with help from Tarun Bharat Sangh, by setting up their village-level committee, without seeking any assistance from the state. Their efforts are still appreciated even by the state officials. However, the continued state apathy towards the locals proved to be a destructive factor, particularly when the villagers' level of development initiatives reached the point of diminishing returns. This has resulted in the breakdown of the villager's willingness to conserve their natural surroundings and wildlife habitat, thus resulting in a substantial increase in the incidents of tree felling ---which has provided strength to the department's argument that they were right all along, in asking the locals to relocate and leave their homes so that the department could 'save' precious natural wealth of our country. Similar outcomes were revealed by Ostrom's study of the functioning of schools in Nigeria.74

Such outcomes in no way negate the significance of the role that the state has in conserving natural resources. However, the state can not accomplish this alone, as these efforts can succeed only if they are able to respect and forge an alliance with the locals of the respective region. They have to give up their attitude of we operate and you cooperate. NWDPRRA project has been selected for study to understand and analyze this aspect in a particular.

To conclude, the soil and water conservation measures provide an opportunity to develop the potentiality of growing food in the fields of

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72 Palit (1996), “Indian forest department in transition”, in (ed) Mark Poffenberger and Betsy McGean, Village Voices, Forest Choices: Joint forest Management in India (Delhi: Oxford University Press); 228.
74 Ostrom, Elinor (1996).
precisely those families who have to go empty stomach inspite of government's packed godowns. These works most significantly provide an opportunity for the Indian irrigation department and rural communities to move from a history of opposition and conflict towards cooperation. This transition assumes the development of new communication channels, attitudes and relationships that could help in overcoming the barriers of hierarchy, caste, class and gender. Both the state and society have set on the right path (at many places) for attaining sustainable development, though this is just a beginning as there is plenty of ground that both have to cover.