The main purpose of the present investigation was to know the impact of watershed development programme on rural community in terms of productivity of major crops in the area aspect before and after watershed development programme. The chapter presents result of socio economic changes after implementation of watershed development programme.

5.1 Impact of watershed development programme on productivity of major crops in the area.

5.2 Social and economical aspects of rural structure and change made therein due to the watershed programme.

5.1 Impact of watershed development programme on productivity of major crops in the area:-

Before watershed project-

On the basis of practice wise Impact of watershed development programme on productivity of major crops in micro watershed area before implementation of watershed development programme, the beneficiaries were categorized into the three groups. With regards to the selection of improved seed, most of the respondents (45.33%) were in low category, followed by 31.67 % respondents found medium category, while 23 per cent of the respondents in high category. Regarding to the method of sowing, highest percentage of the respondents (45.33%) was in medium category, 35.67 per cent respondents in low category while, 19 per cent respondents in high category. With regards to the fertilizer management, maximum (44%) of the respondents were in low category followed by 31.33 per cent respondents found medium category, 24.67 percent respondents in high category. Regarding to the irrigation management, more than half of the respondents (51%) were in low category followed by 34 per cent respondents found medium category, 15 per cent respondents in high category. With regards to
the selection of plant protection, majority of the respondents (50.33%) were in low category followed by 33 per cent of the respondents found medium category, 16.67 per cent respondents in high category. Regarding to the yield of major crops, majority (53.67%) of the respondents were in low category followed by 30.67 per cent respondents found medium category and 15.66 per cent of the respondents in high category.

Table 31: Distribution of respondents according to practice wise impact of watershed development programme on major crops in watershed areas

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Activity</th>
<th>Practice wise impact of watershed development programme on productivity of major crops</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L M H</td>
<td>L M H</td>
</tr>
<tr>
<td>1</td>
<td>Selection of improved seed:</td>
<td></td>
<td>136 (45.33) 95 (31.67) 69 (23.00)</td>
<td>67 (23.33) 146 (48.67) 87 (29.00)</td>
</tr>
<tr>
<td>2</td>
<td>Method of sowing</td>
<td></td>
<td>107 (35.67) 136 (45.33) 57 (19.00)</td>
<td>69 (23.00) 148 (49.33) 83 (27.67)</td>
</tr>
<tr>
<td>3</td>
<td>Fertilizers management:</td>
<td></td>
<td>132 (44.00) 94 (31.33) 74 (24.67)</td>
<td>87 (29.00) 116 (38.67) 97 (32.33)</td>
</tr>
<tr>
<td>4</td>
<td>Irrigation management</td>
<td></td>
<td>153 (51.00) 102 (34.00) 45 (15.00)</td>
<td>56 (18.67) 133 (44.33) 111 (37.00)</td>
</tr>
<tr>
<td>5</td>
<td>Plant protection</td>
<td></td>
<td>151 (50.33) 99 (33.00) 50 (16.67)</td>
<td>86 (28.67) 142 (47.33) 72 (24.00)</td>
</tr>
<tr>
<td>6</td>
<td>Yield of major crops</td>
<td></td>
<td>161 (53.67) 92 (30.67) 47 (15.66)</td>
<td>79 (26.33) 137 (45.67) 84 (28.00)</td>
</tr>
<tr>
<td></td>
<td>Overall Average Total</td>
<td></td>
<td>140 (46.67) 103 (34.33) 57 (19.00)</td>
<td>74 (24.67) 137 (45.67) 89 (29.66)</td>
</tr>
</tbody>
</table>

(Figures in parentheses are percentage)

L = low  M = medium  H = high

After watershed project-

Table 31 indicates on the basis of practice wise Impact of watershed development programme on productivity of major crops in watershed area after implementation of watershed development programme, the beneficiaries were categorized into the three groups. With regards to the selection of
improved seed, majority (48.67%) of the respondents were in medium category followed by 29 per cent of the respondents found high category, 23.33 per cent of the respondents in low category. Regarding to the method of sowing, highest percentage of the respondents (49.33%) were in medium category followed by 27.67 per cent respondents found high category, 23 per cent respondents found low category. With regards to the Fertilizer management, maximum of the respondents (38.67%) were in medium category followed by 32.33 per cent respondents found high category, 29 percent respondents in low category. Regarding to the irrigation management, maximum of the respondents (44.33%) were in medium category followed by 37 per cent respondents found high category, 18.67 per cent respondents in low category. With regards to the selection of plant protection, highest percentage of the respondents (47.33%) were in medium category followed by 28.67 per cent respondents found low category, 24 per cent respondents in high category. Regarding to the yield of major crops, most of the respondents (45.67%) were in medium category followed by 28 per cent respondents found in high category and 26.33 per cent respondents in low category. The findings are in conformity with Jirli & Kumar (2010), and Singh et al. (2012).

**Overall impact of watershed management programme on productivity of major crops**

Overall impact of watershed project on productivity of major crops revealed that 22 per cent respondents were shifted from low category to medium and high category while 11.34 per cent respondents were increase in medium level category and 10.66 per cent respondents were in high category.

**Table 32: Overall impact of watershed management programme on productivity of major crops**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Category</th>
<th>Before</th>
<th>After</th>
<th>Increase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low</td>
<td>140 (46.67)</td>
<td>74 (24.67)</td>
<td>-22.00</td>
</tr>
<tr>
<td>2</td>
<td>Medium</td>
<td>103 (34.33)</td>
<td>137 (45.67)</td>
<td>11.34</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
<td>57 (19.00)</td>
<td>89 (29.66)</td>
<td>10.66</td>
</tr>
</tbody>
</table>
5.2. Social and economical aspects of rural structure and change made therein due to the watershed programme

1. Land use pattern, cropping pattern and agricultural productivity

There is an attempt here to explain the various factors which affect the land use pattern, cropping pattern and agricultural productivity.

(a) Change in land use pattern

There has been change in a positive direction after implementation of watershed development programme. As per the study, villagers said about 25% to 60% changes in land use in village of watershed area. This is especially due to initiation of vegetable cultivation especially in fields close to development of irrigation structures. There is also decrease in cultivable wastelands due to WDP in the village. On an average about 55 per cent of the cultivable wastelands especially that are nearby the newly developed irrigation structures are put into use i.e. cultivation started in these wastelands due to WDPs.

(b) Cropping pattern and agricultural productivity

Since water is essential for agricultural production, the provision of adequate water by means of increasing ground water level and conservation of surface water are instrumental. There has been a significant change in agriculture productivity with available water harvesting structure after implementation of programme, farmers are inclined to new cropping pattern and agricultural diversification. Both agricultural diversification and intensification lead to increase in agricultural productivity in the villages where watershed programmes are effective.

(c) Crop diversification

Crop diversification is also an important outcome of the watershed programme. In Datia, the districts covered under study such as Ansuli, Berkheda, Diguwaon, Fatehpur, Inguwai, Jori, Kharona, Maharoli, Puradaboh and Teda have resulted better adoption to commercial crops especially among the small and medium farmers. In most places, the farmers tend to move towards growing cotton and in some places, the farmers are slowly moving towards growing fruits and vegetables. Vegetable cultivation is
popular where there is adequate water or irrigation facility available. However, very less people are interested so far to take up micro enterprises initiatives. It is reported that there is hardly any component or budget provision for production enhancement on agricultural diversification and it was visualized that once natural resources are conserved farmers on their own invest for such development.

By and large crop diversification is possible due to WDPs. In some states there is more preference to commercial crops with better water harvesting structures and in irrigated areas.

(d) Cropping intensity

The change in cropping intensity is one of the major indicators to assess impact of the watershed development programmes.

In watershed area it was reported that out of 12 sample watersheds almost 11 (>90%) watersheds have noticed increase in cropping intensity. Majority of watersheds have noticed increase in yield of cereals, pulses, cash crops, etc. However, this is not uniform across watersheds. This has been possible due to increase in moisture availability in soil and extending irrigation from surface as well as ground water. Farmers are showing interest towards wheat, vegetables and commercial plantations. These are mostly seen in the lower reaches of water harvesting structures. Due to improvement in irrigation below the existing water harvesting structures the yield of common crops such as cereals, pulses, oilseeds, fruits, vegetable and cash crop (potato) has been increased by 50-100%, 25-50%, and <25%, respectively. It is observed that by WDP the milk production has increased by 50-100% of the average output. Efforts should be made to increase the yield of common cultivated crops by adopting the following measures:

- High yielding / Hybrid variety of seeds
- Judicious use of irrigation water
- Short duration and with low requirement of moisture level crops
- Proper use of manures and fertilizers
2. Reduction in workload

After the intervention of the land development and bunding activities under watershed programme, the land which was earlier tough and lacked moisture becomes bit loose. Rainwater also gets harvested which helps in the retention of moisture in the soil. Further, the increase in ground water and surface water also helps for providing drinking as well as irrigation water and reduces the time to fetch drinking water. As soil and water quality and quantity improve the availability of fodder and fuel wood also increases. Further, for women who are primarily assigned to fetch drinking water and water for all other household activities, watershed development programmes have been very instrumental in reducing work load.

3. Debt reduction position

Assessment of debt reduction position is one of the important objectives of the study. Reduction of debt has many social and economic implications. This can help in reducing poverty and improving livelihood. Before implementation of water shed programme, with the absence of proper irrigation facility, the crop loss is frequent. The crop loss after huge investment in agriculture makes the farmers dependent on money lenders and intermediaries. Many studies on farmers’ indebtedness have reported that the farmers are victims of money lending. They fall under huge debt trap after investing large chunk of money in fertilizer, hybrid seed, cultivation operations, etc. without protective irrigation facilities. After implementation of programme in such scenario, WDPs have helped a lot in providing irrigation facilities for better agricultural operation. It is already analyzed before that the WDPs have helped improving land use pattern, cropping pattern and agricultural productivity, livestock rearing, etc. The positive changes in agriculture, horticulture and livestock production have helped better income generation and debt reduction.

There has been significant impact found on debt position as in 11 watershed areas debt has been reduced significantly, out of 12 sample watersheds, and in remaining 1 watersheds debt position did not reduce. However, the percentage of reduction in debt position is not similar across watersheds. The income generating activities carried out under the project in
Datia helped the poor people in getting some regular income. The overall poverty level was reduced from 45 per cent to 36 per cent in the project area.

4. People’s Participation

Participatory approach is essential in the planning and development of the watershed management programme so that it becomes the peoples programme with the government participating in it as a facilitator only. Active peoples participation is, therefore, highly critical in the success of the watershed program. The available evidences confirm that there existed a positive relationship between people’s participation and benefits from watershed program. The results of this study showed that the benefits were the highest from the watersheds where people’s participation was high. At majority of the places it was moderate and in few it was conspicuous by absence. The other impact indicators were also far ahead in watersheds having greater people’s participation.

5. Social audit

There has been significant impact of exercise of social audit, seems all the more important when the stakes are high both in terms of investment and benefit. It also helps in making the program transparent. Social audit is conducted jointly by the government and the people, especially by those people who are affected by, or are the intended beneficiaries of the scheme being audited.

The scope of social audit:

- A social audit is conducted over the life span of a scheme or programme, and not just in one go or at one stage
- It audits the process, the outputs and the outcome
- It audits planning, implementation, monitoring and evaluation

It is pertinent to mention here that the purpose of conducting social audit is not to find fault with the individual functionaries but to assess the performance in terms of social, environmental and community goals of the organization.
Government audit remains the basic audit, but becomes more transparent and participatory. Social Audit provides an assessment of the impact of organizations non-financial objectives through systematic and regular monitoring, based on the views of its stakeholders. The foremost principle of social audit is to achieve continuously improved performances in relation to the chosen social objectives. Thus, it is evident from the analysis that the position leaves much to be desired and therefore, calls for concerted efforts from the authorities concerned in terms of policy, planning and post implementation.

6. Reduce migration

Migration occurred from January to May in all twelve watershed area. About two-third of the total households reported at least one person migrating in the non-rainy seasons for seasonal employment. About one-third of the total households had to migrate with their families. The number of households with seasonal migration was significantly lower (11%) after implementation of watershed programme compared to before implementation (32%).

7. Occupation and financial condition

Occupational prestige, as one component of SES, encompasses both income and educational attainment. Occupational status reflects the educational attainment required to obtain the job and income levels that vary with different jobs and within ranks of occupations. Additionally, it shows achievement in skills required for the job. Occupational status measures social position by describing job characteristics, decision making ability and control, and psychological demands on the job. In their occupation of datia block watershed stated that only 44.33 per cent were employed in agriculture, 29 per cent engaged in agriculture + animal husbandry, 15.33 per cent occupied in agriculture + animal husbandry + govt./private job, 11.33 per cent occupied in agriculture + animal husbandry + business before watershed programme and overall annual income 50.67 percent had low annual income, 42.33 per cent had medium annual income and only 7 per cent had high annual income after that ending of the watershed programme some respondents were changed in occupation because water availability were increased and also annual income were changed reported that 19.67 per cent
respondents were shifted from low category to medium and high category, while 9.27 per cent respondents were increase in medium level category and 10.33 per cent respondents were in high category.

8. Women empowerment

Women especially from the small and marginal farming families perform over 60% of on-farm activities and almost all off-farm activities. Village women play an important and significant role in watershed development activities. The study revealed that village women had medium/average participation in watershed practices and also important significant role in the watershed. The income level benefit increased after implement the watershed project.

For gender mainstreaming and empowerment of women, women are involved at every stage of the project. The VWC (Village Watershed Committee) has at least 20% representation by women. Further, there is a special provision of Women's Development Fund under the programme by earmarking 5% of project funds for forming SHGs and promoting savings and lending activities, and for taking up 'Social Development' and 'Income generating activities'.

This has resulted in better performance of the project and has also empowered the women especially their economic status.

9. Livestock production

In case of livestock observed that all the beneficiaries' categories i.e. marginal, small and large farmers together were having cows (254), buffaloes (185) and goats (79) before watershed programme. This number increased upto 289, 311 and 97 respectively. Reported that out of the total milk production 74, 503.25 lit./ year had before watershed project after that ending of the project increased to total milk production 84, 408.75 lit./ year.