CHAPTER XII

SUMMARY & CONCLUSION
Irrigation possesses overwhelming importance for the agriculture dominated economy of Orissa, since it guarantees stability of crop output in the face of a notoriously inconsistent rainfall, acts as an infrastructural pre-requisite for sizeable enhancement of farm yield and causes substantial expansion in employment opportunities in the rural sector. Development of irrigation has, therefore, continued to receive top priority in the public sector investment right from the commencement of planning in the State since 1951. Further, the investments on major and medium irrigation systems in the State have been substantially higher than that of on minor irrigation. In view of investments of scarce resources on irrigation, it is imperative that the irrigation facilities created in the State are optimally used and concerted efforts made to maximise the productivity of water. Unfortunately, the magnitude of utilisation of the available irrigation facilities in the major and medium projects in Orissa has been unsatisfactory. Excessive under utilisation, chronically plagues the major and medium irrigation system. Essentially such under-utilisation implies permanent loss of a costly input like irrigation water.

This under-utilisation of irrigation potential in Orissa is observed to have been on account of (a) incomplete water conveyance system and inadequate drainage facility
at the farm level, (b) lack of integrated on-farm development in the irrigated command areas and (c) excessive fragmentation of land holdings.

In order to ensure effective utilisation of irrigation potential in the command areas of major irrigation projects by bridging the gap between the creation and utilisation of such potential and to bring about an overall development of the command areas of major-irrigation projects and to increase the farm productivity, the government of Orissa with active participation of the government of India initiated a scheme called "Command Area Development Programme" in 1974, although it started operating in full swing in 1976. For effective implementation of the programme, four Command Area Development Authorities were set up - 'or bhakud Far at Bhubanpur, Mahanadi Delta Stage-I at Cuttack, Mahanadi Delta Stage-II at Ratnagiri Island Project at Bhadrak. These CAs, therefore, have been functioning since more than a decade. In view of the expenditures incurred on the programme and the priority attached to the programme, it is essential that an evaluation of the impacts achievements and shortfalls of Command Area Development Programme in the State is carried out.

Against such a background, this study was undertaken (i) to objectively evaluate the different impacts of the Command Area Development Programme on the farm economy both at macro as well as micro levels, (ii) to examine the
performance of CDP in terms of improvement of utilisation of irrigation potentials already created, (iii) to analyse the organisational and administrative efficiency of the CDPs and to study the issue of participation of the farmers in the programme, and (iv) to find out if there exists any regional variation among the four CDPs in respect of cropping intensity, pattern of cropping, crop productivity and profitability at farm level. The investigation was carried out both at macro as well as micro level. The summary of the major findings and certain relevant policy implications emerging therefrom have been presented hereunder.

The four CDPs in Orissa cover a total culturable command area of 531 thousand hectares in kharif and 342 thousand hectares in rabi season. Thus, the total gross culturable command area of the four projects comes to 773 thousand hectares. The coverage of culturable command area is the highest in Mahanadi Stage-I with 32.85 per cent when the total kharif and rabi areas of the four commands are taken into account. Next to it, Mahanadi Stage-II covers 31.53 per cent of the total culturable command area followed by Bhirakud with 28.74 per cent and Balindri with 5.88 per cent. All these command areas are irrigated through canal systems.

The analysis on physiographic features of the four command areas shows some variations in respect of topography
and soil conditions, though in respect of rainfall, little difference is observed among them. In respect of land utilisation pattern, it is found that more than 60 per cent of the total geographical area is 'net sown area' in all the four command areas. The land-holding pattern indicates the concentration of small and marginal farmers in all the commands with some variations in degree.

Though paddy is the major crop in all the four command areas, yet there is difference in respect of percentage of such sown area to the total cropped area. For example, while during kharif season, paddy covers around 74.4 per cent of the total cropped area in Hirakud Command, it is 76.1 per cent in Hirakud Command, both in Sambalpur and Jaydev-II. Paddy covers not more than 50 per cent during kharif season. However, during rabi season, the major crops grown are HYV paddy, pulses, oilseeds, sugarcane and other cash crops in all the command areas with some differences in degree in respect of coverage of area by such crops.

A broad comparison of cropping pattern of the four command areas shows that the cropping pattern adopted both during kharif and rabi season in Hirakud Command area is more commercialised in comparison with the other three command areas. Among the four command areas, the cropping pattern is most traditional in nature in Jalandi Command since paddy covers as much as 94.4 per cent of the total area under crops.
during kharif season. In Mahanadi Stage-I and Stage-II command areas, the cropping patterns are more or less similar.

In respect of the per hectare consumption of fertilizers and the state of rural electrification, some differences among the four commands are marked. In all the command areas, co-operative credit societies and commercial banks provide credit and other necessary inputs to cultivators. As regards the demographic features, it is found that the command areas are more thickly populated as compared to all-Orissa average. Some differences are observed in case of percentages of Scheduled Caste and Scheduled Tribe population (disadvantaged groups of people) to the total population in the four command areas. While such percentages are lower than the state level percentage in case of Mahanadi Stage-I and Stage-II and Salandi Command areas, it is higher in Hirakud Command area. From the point of view of literacy, similar difference among the four command areas is also observed.

In spite of these differences, it may broadly be stated that Hirakud Command area appears to be the most developed one from the point of view of agriculture or farm enterprise, followed by Mahanadi Stage-II, Mahanadi Stage-I and finally by Salandi Command area.

The review of the strategy and operation of CP at macro-level indicates that the objective to optimise...
the productive use of available irrigation water has been sought to be achieved through (a) provision of field channels at the farm level, (b) construction of associated control structures and lining of critical water sections, (c) water distribution to each farm, (d) development of proper drainage that eliminates water-logging in low-lying areas, (e) proper on-farm development and (f) land consolidation works.

Our major findings from the study on the impacts of the CDP through macro-analysis as revealed from the published materials are as follows:

(i) In all the four command areas, there has been favourable and positive "area effect" during the period of operation of CDP. The 'net sown area' as well as the 'gross cropped area' have increased in all the four command areas. The index of cropping intensity has gone up in all the four commands. However, the cropping intensity is marginally higher in Hirakud and as compared to Valandi command and is fairly at a lower level compared to both Mahanadi Stage-I and Stage-II commands.

(ii) Investigations show that CDP has favourably influenced the crop pattern in both kharif and rabi seasons with increasing cultivation of
nigh-yielding, more remunerative and less risky crops in different zones.

(iii) The per hectare yield rate in case of both normal and RF paddy in kharif season have increased in all the four command areas during the period from 1976-77 to 1984-85. So also per hectare yield rate in case of crops like RF paddy, pulses and oilseeds have increased in all the command zones during rabi season in the aforesaid period.

(iv) From the analysis of data relating to the total output, it is also found that there has been increase in the production of crops, both during kharif and rabi seasons in all the command areas.

However, it is pertinent to point out that in spite of the favourable impacts as observed at macro-level, the target level of cropping intensity, the desired cropping pattern-mix, the application of recommended doses of inputs and optimal crop productivity have not yet been realised.

Further, one of the main objectives of command area development being optimal utilisation of the created irrigation potential, the success or otherwise of the programme has been sought to be evaluated from the extent to which it has improved this level of utilisation.
It is observed that increase in the utilisation of created irrigation potential has taken place in kharif as well as in rabi season over years in all the four command areas. In Mahanadi stage-I, the potential utilisation has increased from 64 per cent in 1975-76 to 97 per cent in 1985-86 in kharif and from 34 per cent to 68 per cent in rabi season during the same period. In Valanji command area the percentage has gone up from 84 per cent to 99 per cent in kharif and from 51 per cent to 63 per cent in rabi season and in Hirakud command area, the utilisation percentage has increased from 95 per cent to 99 per cent in kharif and 55 per cent to 76 per cent in rabi season in 1985-86 over 1976-77.

However, although the command area development programme has pushed up the utilisation of irrigation potential already created to boost up agricultural production, yet the utilisation level has not gone up to that level where the index of cropping intensity can go up to 300 per cent as envisaged prior to the introduction of Command Area Development Programme.

Investigating into the reasons for which this did not succeed in completely eliminating the phenomenon of under-utilisation of irrigation potential in the command areas, the researcher found the following inhibiting factors.
(i) Inadequate maintenance of embankments and irrigation structures.

(ii) Poor distributive system.

(iii) Improper levelling and shaping of land.

(iv) Inadequate drainage facility.

(v) Predominance of heavy duty crops.

(vi) Fragmentation of holdings.

(vii) Absence of water regulatory structures.

(viii) Inadequate technical personnel.

(ix) Lack of participation among the farmers.

(iv) Inadequate maintenance of embankments and irrigation structures.

(iii) Improper levelling and shaping of land.

(iv) Inadequate drainage facility.

(v) Predominance of heavy duty crops.

(vi) Fragmentation of holdings.

(vii) Absence of water regulatory structures.

(viii) Inadequate technical personnel.

(ix) Lack of participation among the farmers.

However, most of the above inhibiting factors arise mainly due to organisational and administrative weaknesses and lack of active participation of the farmers in the implementation of the programme. Organisational and administrative efficiency has been assessed in the context of the effective implementation of various programmes in the command areas and utilisation of allocated funds for such programmes. The following findings on this issue are obtained from the analysis.

(i) Land development works have not been undertaken voluntarily by the intended beneficiaries in spite of subsidies and concessional finance extended to them by the Government.
(ii) In the absence of land development in extensive scale and slow progress in consolidation works, other programmes like construction of field channels, operation of on-farm development works, drainage-cum-recycling and surabandi programmes have not made appreciable progress. For example, hardly 36.71 percent of the total cultivable command area has been covered under consolidation of holdings programme till 1983-84. Since this is linked with on-farm development work, area covered under this programme comes to only 16.78 percent of the total cultivable command area.

(iii) Further, it is also found that even if CCL work has been completed in some areas, this has not led to much improvement in the situation because of (a) absence of construction of field drains, (b) non-execution of access-crossing over channels and drains, (c) lack of follow-up action immediately after the construction of field drains, and (d) the ineligibility of large number of farmers for bank loans due to unclear titles. It may be relevant to point out that under OFD programme only construction of field channels has been given some importance and that too, in a limited area. What is more, as the researcher herself observed in the course of
her micro-study that often the field channels are not properly constructed and are sub-standard as per engineering specifications.

(iv) Programmes like (a) Minikit, (b) Contive trills, (c) Multi-crop Demonstration, (d) Farmers' Training and (e) Provision of Incentives to Farmers are being operated in the command areas, but their operation is still limited only to a few pockets of the entire command area.

All these speak of the fact that there has been absence of effective implementation of various programmes in a systematic and planned manner in the command area for which expected results are yet to be achieved.

Organisational and administrative weakness is further revealed from the fact that even funds allotted for different programmes have remained unspent and funds shown to have been utilised have not been utilised properly. Some of the important components of command area development strategy have not been put to effective execution as a result of which better use of irrigation potential has not been possible. It is found that in case of construction of field channels, the major component of the PD work out of the total amount of Rs.43,300 thousand allotted, the amount spent was of the order of Rs.36,551 thousand, which works out to 78 per cent. Moreover, various instances of improper
utilisation and diversion of funds from command area development works indicate the operational inefficiency of the Command Area Development Authorities. This happens because of the lack of co-ordination among the various departments working for the implementation of command area development programmes and the inter-departmental conflicts and rivalries. In addition, implementation of different works at the project level by untrained personnel and the poor extension services are also responsible for unsatisfactory performance of the command area development programmes.

The extension work is being done by the Village Agricultural Worker (VAW) controlled by the Department of Agriculture & Co-operation. Since he is over-burdened with many other works at the block, he fails to give adequate attention to the farmers of the command area. Further, he is also in charge of all villages, both irrigated and unirrigated, in a particular block. In view of these, extension work being done by him is below the expectation and a close rapport between the extension workers and farmers has not yet been established leading to the unsatisfactory performance of command area development programme.

All the above findings support our hypothesis that on account of organisational and administrative weaknesses and lack of active participation of the farm operators in
the programme, the command area development programme has not been able to eliminate the under-utilisation of irrigation potentials which have been created in the command areas.

In order to precisely quantify the different impacts of the command area development programme on the farm economy, a micro-level field study was organised. The reference year for the study was 1984-85, the crop production year.

In the two out of the four command areas, viz., Mahanadi Stage-I and Mahanadi Stage-II, the different socio-economic features are more or less similar and the two districts in which these two CADs operate are geographically contiguous. In view of this, the two command areas were clubbed into one zone named "Mahanadi Delta Stage-I and Stage-II" for the purpose of micro-level enquiry.

From each of the three Command Area Development Projects, one Community Development Block was selected following the simple random sampling procedure. In all, three community development blocks were selected from the three command area development areas.

Further, from each of the selected community development blocks, one on-farm development (OFD) village, one non-on-farm development village (Non-OFD), and one unirrigated village were selected following the simple
random sampling procedure. Thus, from the three blocks, six irrigated villages (three OPD and three non-OPD villages) and three unirrigated villages were selected.

The stratified sampling methodology was adopted for the study. The households of the selected villages were listed out and grouped under the three size classes of operational holdings, i.e. (i) below 1 hectare, (ii) 1 to 2 hectares and (iii) above 2 hectares. In the Janangi and Hirakud Command areas, the total number of sample households from each of the OPD, non-OPD and unirrigated villages under all size group of holdings was fixed at 50 bringing the total number of households to 300 in the six villages of the two command areas for the survey.

But there was a departure from the above norm in the process of fixation of the number of sample households in Mahanadi Delta (Stage-I and Stage-II) Command Area because of relatively less concentration of households in the third, being the highest size group of holding in all the three selected villages. Consequently, the total number of sample households was fixed at 32 in the OPD village, 34 in the non-OPD village and 34 in the unirrigated village bringing the total to 100, instead of 150 households for the survey in Mahanadi Delta (Stage-I and Stage-II) Command area. Thus, the total number of sample households from the three command areas was fixed at 400 for the purpose of field study.
the number of sample households from each size group of holdings in the selected villages under the study concerned areas was drawn on the basis of proportional allocation subject to minimum of four households from a size group of holdings, as the case may be, with consequential adjustments in the other size groups so as to maintain the total number of sample households already fixed up for a selected village for the survey. Selection of sample households was made from each size group of holdings following the simple random sampling procedure.

The vace-study, among other things sought to evaluate the following direct effects of COP, such as, (a) area or acreage effect, (b) crop pattern or crop substitution effect, (c) per hectare yield effect and (d) total output effect. It also estimated the enhance-ment in the non-days of on-farm employment resulting from the implementation of the COP.

Then the net sown area of all the small, marginal and large farmers surveyed from the pilot, non-pilot or unirrigated areas of all the three regions is taken into account, it is seen that the net sown area of the marginal and small farmers do not vary significantly in the pilot, non-pilot and unirrigated villages. But it varies conspicuously in case of the large farmers.
is from 30 to 33 hectares in case of marginal farmers and 60 to 64 hectares in case of small farmers, it is as wide as from 57 to 91 hectares in case of large farmers. However, out of the total net sown area of 512 hectares of the sample farmers covered under all the three command areas, 185.12 hectares (36.16 per cent) are in the non-pilot village, 167.72 hectares (32.75 per cent) are in the pilot village and 159.16 hectares (31.08 per cent) are in the unirrigated village. Further, it is observed that the distribution of net sown area according to types of lands is identical in all the three command areas.

Regarding the impact of command area development programme on the cropping intensity, it is found from the study that the percentage of area sown more than once is the highest (63.30 per cent) in the pilot areas of all the three commands. Next to this, the coverage comes to 55.40 per cent in non-pilot and 27.45 per cent in unirrigated areas. The farmers, irrespective of their size of holdings have taken up double cropping in more areas in the pilot villages than in the non-pilot and unirrigated villages of the three commands.

Thus, it may be said that there has been a positive impact of the command area development programme on the cropping intensity in the pilot area. Further, the cropping intensity has been higher in non-pilot area as compared to unirrigated area because of assured irrigation.
Although no firm trend is noticed in the level of cropping intensity in case of the farmers under different size group of holdings in the areas under pilot, non-pilot and unirrigated conditions, yet the small and marginal farmers have taken up HYV paddy and other commercial crops during rabi season by using irrigation water. As such, the hypothesis that command area development programmes enhance the cropping intensity has been confirmed in affirmative.

The analysis on the cropping pattern leads us to the conclusion that although paddy has dominated the cropping pattern, yet some commercial crops have been taken up by the farmers due to irrigation water available to them and package of development programmes introduced in the command area.

Irrigation has made some impact in adopting or improved cropping pattern, both in pilot and non-pilot villages, but not much of distinction is noticed in the adoption of cropping pattern in these two areas even within the same command area. This implies that other follow-up actions in regard to CPO works have not yet probably made much headway for adopting suitable and profitable cropping pattern. In this connection, it is pertinent to note that changes in the cropping pattern in an agriculturally backward economy like Orissa occurs only very slowly. Our experience in different irrigated areas have led to such a viewpoint. Furthermore, the farmers of Orissa for some
reason or other are generally interested in the cultivation of paddy. However, the construction of field distributary system, drainage channels, levelling of land and consolidation of holdings would, in course of time, induce the farmers in the four command areas to adopt a cropping pattern, which is consistent with revenue maximisation.

From our study of costs and returns of the sample farms in the three command areas, the following important points emerge.

The per hectare Cost A is the highest in pilot area followed by non-pilot and unirrigated areas.

The per hectare Cost B incurred by the large farmers is the highest followed by small and marginal farmers in the pilot, non-pilot and unirrigated areas of each of the three commands except a marginal variation in Sahanadi Delta Command.

The per hectare Cost A is the highest in Sahanadi Command followed by Sahanadi Delta and Silandii areas under pilot, non-pilot and unirrigated conditions.

The increase in per hectare Cost B is higher in the pilot area compared to non-pilot and unirrigated areas of all the command.

The per hectare Cost C has substantially increased over Cost B in the pilot and non-pilot areas on account of deployment of more family labourers for cultivation of crops.
The increase in such cost is found to be highest in case of marginal farmers in all the three pilot, non-pilot and unirrigated areas of the three commands except in the non-pilot and unirrigated areas of Misakud command, where the increase is found to be more in case of small farmers.

The per hectare expense on fertilizers, pesticides and manures is always higher in the pilot area than in non-pilot and unirrigated areas of each of the three commands.

It is observed that there is variation in per hectare expenses on fertilizers, pesticides and manures in different areas (pilot, non-pilot and unirrigated) and under different size of holdings (large, small and marginal).

The percentage of per hectare expense on fertilizers, pesticides and manures to the per hectare cost is higher in the pilot area compared to non-pilot and unirrigated areas of Baland and Mahanadi Delta Command. But in Misakud Command, the percentage is higher in the non-pilot areas compared to pilot and unirrigated areas.

It is revealed that the different development works and the water management programmes in the pilot areas have encouraged the farmers to make higher investments on costly inputs like chemical fertilizers and pesticides, or getting higher returns from farming. Obviously, the large farmers have made higher investments on fertilizers and pesticides because of better financial resources at their
command and their better accessibility to institutional finance.

The per hectare value of output from all crops is the highest in Hirakud Command (Rs.16,345) and lowest in Jalandi Command (Rs.6,387) in pilot area.

Although the per hectare value of output is less in the non-pilot area than in the pilot area, it is more compared to the unirrigated area.

In each of the three pilot, non-pilot and unirrigated areas, the per hectare value of output from all crops is the highest in Hirakud Command Area followed by Nabanadi Delta and Jalandi Command areas.

The per hectare value of output from all crops is the highest in case of the small farmers in each of the three pilot, non-pilot and unirrigated areas of the three commands which shows that the small farmers are more enterprising in nature.

The per hectare value of yield of different crops is the highest in the pilot area of the three commands.

The per hectare value of yield of both kharif and rabi paddy is the highest in the pilot area of Hirakud Command.

In Hirakud and Nabanadi Delta Commands, in addition to paddy, commercial crops have been taken up in pilot and non-pilot areas. In unirrigated area, commercial crops have
also been taken up in the commands.

Small farmers get the highest per hectare return from different crops in each of the pilot, non-pilot and unirrigated areas of all the commands followed in some cases by large and marginal farmers and in some other cases by marginal and large farmers.

The per hectare value of yield of different crops is higher in the non-pilot area compared to the unirrigated area.

Correlation between the per hectare value of yield of a crop and the size-group of holdings is not found in the non-pilot area.

The per hectare value of yield of different crops is the lowest in the unirrigated area of all the three commands.

The per hectare net return is higher in the pilot area than in the non-pilot area of each of the three commands.

The per hectare net return is the highest (Rs.4,698) in the pilot area of Hirakud Command followed by Rs.2,500 in Mahanadi Delta Command and Rs.703 (lowest) in Subarn Command area.

Small farmers have the higher per hectare net return compared to the other two groups of farmers. This
goes to say that the small land holders are efficient farm-operators.

Negative returns from agriculture are found in the unirrigated area of each of the three commands. In other words, the farmers under each size group of holdings have sustained losses in the unirrigated area.

In the non-pilot area also the per hectare net return is higher in case of small farmers than the other two groups.

The per hectare net loss is highest in case of the large farmers in all the three commands. Further, the loss sustained by the large farmers is the highest in Koland Command followed by Hirakud and Ramanandi Valleys Command.

Though there is variation in the magnitude of per hectare net return in the pilot area of the different commands, yet the higher rate of net return in the pilot area shows that there has been a positive impact of command area development programmes on agricultural production.

The per hectare return to family labour is higher in the pilot area compared to non-pilot and unirrigated area of each of the commands. But the excess per hectare return to family labour has been higher in the non-pilot over unirrigated area than such return in the pilot over non-pilot area.
The per hectare farm business income is higher in the pilot area compared to non-pilot and unirrigated areas of each of the three commands.

Small and marginal farmers mostly get higher farm business income than the large farmers.

The excess per hectare farm business income has been higher in the pilot over non-pilot area than in the non-pilot over unirrigated area of Hirakud Command, but the excess farm business income is higher in the non-pilot over unirrigated area compared to the pilot over non-pilot area of Salandi and Mahanadi Delta Commands.

The ratios of gross return to Cost A are higher in the majority of cases in the pilot area than in the non-pilot area of the three commands.

The ratios of gross return to Cost B decrease with the increase in size of holdings in all the command areas except in Hirakud Command where the ratio has increased with increase in the size of holdings upto a certain level and then decreased with the increase in the size of holdings in pilot and unirrigated areas.

The ratios of output to Cost B are higher in the pilot area than in the non-pilot area in case of all size groups of holdings in Mahanadi Delta and Hirakud Commands, but in Salandi Command, such ratios are higher in case of small and large holdings in non-pilot area compared to pilot area.
The ratio of output to cost $C$ has always been higher in the pilot area compared to the non-pilot and unirrigated areas. The overall ratio is 1.33 in the pilot area, 1.11 in the non-pilot and 0.91 in the unirrigated areas.

The ratio of output to cost $C$ is the highest in case of the small farmers followed by marginal and live farmers in the pilot, non-pilot and unirrigated areas.

The analysis as carried out above reveals the following salient points on an overall basis.

First, the farm business income is higher in the pilot area compared to the non-pilot area of each of the three commands. The amount is Rs. 10,985 in pilot area against Rs. 5,602 in non-pilot area of Hirakud Command, Rs. 7,995 in pilot area against Rs. 6,302 in non-pilot area of Mahanadi Delta Command and Rs. 3,981 in pilot area against Rs. 3,352 in non-pilot area of Juslandi Command.

Second, returns to family labour and management is higher in the pilot area as compared to non-pilot area of each of the three commands. The per hectare return to family labour and management in Juslandi Command is Rs. 2,213 in pilot area as against Rs. 2,004 in non-pilot area. In Mahanadi Delta Command the per hectare return to family labour and management is Rs. 4,900 in pilot areas in comparison with Rs. 3,356 in non-pilot area. Similarly in Hirakud Command, the per hectare return to family labour and management is
Rs. 6,570 in pilot area as compared to Rs. 2,754 in the non-pilot area.

Third, the per hectare net return is higher in the pilot area than in the non-pilot area of each of the three Commands. Such return in the pilot area of Mirakud Command is Rs. 4,898 as compared to Rs. 873 in non-pilot area. In the pilot area of Tahanadi Delta Command, net return is Rs. 2,890 in comparison with Rs. 1,807 in non-pilot area. Similarly, in the Calandi Command net return in pilot area is Rs. 705 per hectare as against Rs. 115 in non-pilot area.

Further, the output input computed to show relative farm efficiency under pilot and non-pilot conditions also confirm that in the pilot area, farm households on an average receive significantly higher incomes than the non-pilot farm households.

Using regression analysis to the micro-level field data obtained from the study we found that in the sample study area, farm households of the pilot zone on an average receive significantly higher incomes than the two other zones, non-pilot and unirrigated. This is true for all the three kinds of income (FBI, APMA & MI) and for all the three command areas.

The micro-study also reveals the fact that command area development programmes have also enhanced
labour employment at a higher rate compared to non-pilot and unirrigated areas. While in Sainandi command on an average, the pilot area farms generate 257 man-days of employment as against 243 man-days in the non-pilot area, the corresponding man-days of employment are 290 and 265 in Mahanadi Delta Command and 379 and 308 in Hirakud Command.

The foregoing discussions on impacts of CMD have led to the broad conclusion that farm households of the pilot area in all the three commands have scored over the farm households of the non-pilot area in each of the three commands. This confirms our major hypothesis, developed and put to test that the CSMF undertaken by the Government has positively promotional impact on the rural economy in Orissa.

Another objective of the study was to find out if there exists any regional variation among the four CMDs in respect of pattern of cropping, intensity of cropping, farm yield rate and profitability at the farm level. Major findings on these aspects as obtained from the field data are presented below:

1. A broad comparison of the cropping pattern in different sample command areas indicates that in Hirakud Command area, triple cropping pattern has been taken up both in pilot and non-pilot
double cropping is adopted. In the other two command areas, such as, Mahanadi Stage-I and Stage-II, and Salandi, usually two crops are grown in a year on a single patch of land. It is a fact that growing of three crops a year in Hirakud has been possible in both pilot and non-pilot areas because of availability of irrigation facilities.

Such a finding on cropping pattern indicates that the farmers of Hirakud Command Area are more progressive than the farmers of other two command areas.

(i) A comparison of the cropping intensity in the command areas shows that the cropping intensity is the highest, being 188.40 per cent in Hirakud Command Area followed by 135.93 per cent in Mahanadi Delta Stage-I, Stage-II and 132.14 per cent in Salandi Command in the pilot area. In other areas, regional variation is also marked in case of cropping intensity of the three commands.

(iii) The per hectare yield of both kharif and rabi paddy, the most dominant crop of the area, is the highest in the pilot zone of Hirakud Command Area. While the per hectare yield of kharif paddy is 25.23 quintals, it is 33.04 quintals during rabi season in Hirakud Command Area.
Next to Hirakud Command area, such yield rates are lower in Mahanadi Delta Command area, being 20.23 quintals in case of kharif paddy and 26.93 quintals in case of rabi paddy. However, the lowest yield rates of 18.67 quintals of kharif paddy and 23.90 quintals of rabi paddy are found in the pilot zone of Salandi Command area.

(iv) The profitability of farm operations in the three sample command areas indicated through the ratio of output to cost is also varies from one area to other. While the overall ratio is the highest in case of Mahanadi Delta Command area being 1.67, it is 1.67 in Hirakud Command area and the lowest in Salandi Command area (1.52) in the pilot situation.

The above findings support our hypothesis that regional variations are there among the different Command areas of the State in respect of pattern of cropping, intensity of cropping, farm yield rate and profitability of crop enterprise at the farm level.

Policy Implications

From our study of different aspects of Command area development programme in Orissa, some policy recommendations emerge. Certain steps may be taken, both at the State level and project level, in order to improve
organisational efficiency for effective and expeditious implementation of this command area development programme.

The policy decisions suggested are as follows:

(i) It may be examined if the personnel of the Departments of Agriculture, Irrigation, Co-operatives, and Revenue working at the field level for various programmes can be suitably placed under the control of Command Area Development Authority in each command zone. Keeping them all under one umbrella, the works can be executed in a systematic way with a good co-ordination. World Bank also approved this idea.

(ii) Adequate powers may be vested with CADAs to effectively function as a fully responsible implementing agency. The CADA should be responsible for the proper utilisation of funds released for different purposes. Proper evaluation of the plans implemented should be made regularly in order to assess the impact of the programmes on the farm economy.

(iii) The Village Consolidation Committee may be converted into an Irrigation Committee or an Agriculture Irrigation Committee may be formed, which would serve as a co-ordinating agency between the farmers and the agricultural engineering level.
for the purpose of field acceptance of the irrigation schedule, the latter through subtle field staff shall ensure supply of required water to the field of the respective farmer for irrigation.

(iv) The extension work in the command area may be done by well-trained Village Agricultural Worker (V.A.W). They should have close liaison with village level Irrigation Committee, credit agencies and agencies supplying agricultural inputs.

In conclusion, it may be pointed out that the earlier concept of command area development programs is changed from merely providing water courses and field channels to the present comprehensive task of land development and provision of infrastructure and inputs to the beneficiaries. In view of this, the present organisational set-up of C.W.W has become one inter-departmental organisation in many States in India, where such programmes are under implementation. Despite the clear-cut guidelines issued by the Government of India for having an adequate and efficient inter-departmental organisation to implement the multi-nature programmes of command area development, Orissa is still lagging behind in this regard. In contrast, Rajasthan and Andhra Pradesh have developed effective organisational set-up. This has been possible partly because of the foresight of their officers, but largely because of the pressure put on
The ultimate objective of the 
CWP is to promote rural prosperity through intensive 
and productive agriculture. This can be achieved only 
when the CWP authorities are well-organised and adequate 
administrative and financial powers are delegated to them.

Although some measures for improvement in the 
existing organisational set-up in the command area have 
been initiated in Orissa in the recent years, yet 
deficiencies in implementing various schemes and utilising 
the available funds still continue. A total reorganisation 
of the existing working system with introduction of a 
bound achievement of financial and physical targets will 
no doubt, pay rich dividends.

The Government of Orissa should, therefore, 
carefully consider these policy recommendations keeping 
in view the fact that irrigation water has become an 
input for Orissa, and improvement of the irrigation is 
leading to effective utilisation of the potential and also 
along with on-farm development of the command area as 
the basic and necessary precondition for accelerated 
agricultural development of this typically backward area.