

IRRIGATION DEVELOPMENT IN INDIA - A FIRM STEP TOWARDS FOOD SECURITY

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ABSTRACT

Since independence India has remained agriculture based country. At the time of independence about 80% of the population was dependent on agriculture. With the urbanization and industrialization in post independence era, the Indian population's dependency on agriculture has gradually reduced from 80% to 50%. However the growth of population is yet to stabilize. It is expected that the population of India will stabilize around the year 2050 and the projected population of the country would be around 165 crore. This shows that our demand for foodgrain production will continue to rise till 2050. Keeping the above fact in view, India embarked on a large program of water resources development, soon after its independence in 1947. Variation in rainfall with respect to space and time and dependency of farmers on rainfed irrigation led to frequent droughts in the country in pre and post independence till 1960s. As such there was shortage of food in general and the Government had to import foodgrain from other countries. That is why the general shortage of food became the main drivers of water planning. The multipurpose river valley development was the chosen vehicle of change. Providing assured irrigation to farmers for increased foodgrain production became the main objective of the Government and this was followed by flood control and hydro-electric power generation. A large number of water projects, including large storage and diversion projects were implemented. As a result, the irrigation potential of about 127 million hectare is reported to have been created by March, 2018 against ultimate irrigation potential of 140 million hectare (This includes irrigation potential of all Major Medium and Minor Irrigation Projects.). During the course of above achievement, some major corrective measures like Command Area Development (CAD) Programme, Participatory Irrigation Management (PIM) approach, Accelerated Irrigation Benefit Programme (AIBP) and Pradhan Mantri Krishi Sinchai Yojna (PMSKY), etc were taken. Further it is expected that additional irrigation potential of about 5 million hectare alone would be created through 45 projects under PMSKY targeted to be completed by December, 2019, thus taking the irrigation potential achieved upto 132 million hectare. This shows that in another 3-4 years we are likely to achieve ultimate irrigation potential if same pace of irrigation development is maintained. As a result, Country's foodgrain production touched the figure of 290 million tonnes in the year 2017 and country is now not only self sufficient in foodgrains but it is exporting foodgrains also. However now question arises as to would this irrigation development be sufficient to grow foodgrain requirement for the year 2050.

In this context it is stated that as per an earlier estimate the present foodgrain requirement for the year 2050 for an estimated increased population has been assessed as about 450 million tones. However a mid-term assessment indicated that India requires an irrigation potential of atleast 160 million hectare to grow the foodgrains and meet the increased demand of population of India in the year 2050. National Perspective Plan prepared by Government of India suggested that if nation goes for long distance inter basin water transfer or water transfers between important sub-basins of a basin, an additional area of 35 million hectare can be brought under irrigation raising the ultimate irrigation potential from 140 million ha to 175 million ha.

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So Government of India has already initiated action for implementation of long distance inter-basin water transfer. This shows that irrigation development in India is a firm step towards food security.

1. INTRODUCTION

India has remained agriculture based country for quite a long time. During the year 1950-51 when country's population was 361 million, its foodgrain production was 50.8 million tonne only which was not adequate enough to feed the then population. Industrially India was lagging behind. So, about 80% of the population was dependent on agriculture. With the urbanization and industrialization in post independence era, the Indian population's dependency on agriculture has gradually reduced from 80% to 50%. The country's foodgrain production touched the figure of 277.49 million tonnes in the year 2017-18, registering a rise of 460% over last 66 years but the question arises as to whether this much rise in foodgrain production is sufficient for the present and future population of the country. If we see the population figures, it is also rising continuously and touched the figure of 1300 million. However the growth of population is yet to stabilise. It is expected that the population of India will stabilize around the year 2050 and the projected population of the country would be around 1650 million. This shows that our demand for foodgrain production will continue to rise till 2050. Keeping the above fact in view, India embarked on a large program of water resources development, soon after its independence in 1947. Variation in rainfall with respect to space and time and dependency of farmers on rainfed irrigation led to frequent droughts in the country in pre and post independence till 1960s. As such there was shortage of food in general and the Government had to import foodgrain from other countries. That is why the general shortage of food became the main drivers of water planning and providing assured irrigation to farmers for increased foodgrain production became the main objective of the Government, followed by flood control and hydro-electric power generation.

2. STATUS OF IRRIGATION AT THE TIME OF INDEPENDENCE

During 1950-51, total irrigation potential of the country was 22.60 million hectare, against the Ultimate Irrigation Potential of 140 million hectare. This shows that the farmers had to depend on rains for cultivation of their field. In other words rainfed irrigation was available to the major part of cultivable land in the country. As a result, yield per hectare of land was as low as 522 kg (0.52 tonne) per hectare at that time. Variation in rainfall with respect to space and time affected the crop production. As mentioned earlier, the foodgrain production at the time of independence was about 50 million tonne only. Later increase in our food grain production led us to self sufficiency in food. This increase in foodgrain production in India is mainly attributed to Green Revolution which refers to a period when *Indian* agriculture was converted into an industrial system due to the adoption of modern methods and technology such as the use of High Yielding Variety (HYV) seeds, tractors, irrigation facilities, pesticides, and fertilizers. Out of these factors, irrigation facility is the most important factor of foodgrain production because without water even seed whether normal or HYV, cannot germinate. For Paddy/Rice which is staple food for large part of the country, water is required for field also before sowing the crop, apart from different waterings during life of crop. So when planning process of the independent India started in the year 1951 through Five Year (FY) Plans, more emphasis was given to the irrigation sector, particularly, in first and second Five Year Plans (1951-56 & 1956-61). Initially, allocation of fund to this sector was even more than 20% of the overall budget of the country. Gradually this percentage came down in subsequent Five Year Plans. The basic objective of giving more emphasis or according high priority to this sector was to provide assured irrigation to farmers for increased foodgrain production. As a

result, large number of major/medium/minor irrigation projects was taken up for implementation and completed. This resulted in increased irrigation potential.

3. MAJOR STEPS TAKEN FOR IRRIGATION DEVELOPMENT

3.1 Command Area Development (CAD) Programme

As mentioned earlier, creation of irrigation potential increased in the country due to construction of large number of irrigation projects in 1950s and 1960s. However, it was subsequently felt that farmers were not able to draw as much benefits as was envisaged from the projects. Main reason for this was that development of command beyond minor outlet was left to the farmers. Later, during early seventies, analysis of Irrigation Potential Created (IPC) and Irrigation Potential Utilized (IPU) revealed that there was a substantial gap between them. The Irrigation Commission made specific recommendations in its report in 1972 that systematic development of commands of irrigation projects should be taken up in order to fully utilize the irrigation potential created. Subsequently a Committee of Ministers set up by the Ministry of Irrigation and Power analyzed the issue and suggested in 1973 that a broad based Area Development Authority should be set up for every major irrigation project to undertake the work of comprehensive area development. Based on this recommendation, the Government of India initiated a Centrally Sponsored Command Area Development Program (CADP) in December 1974 to improve irrigation potential utilization and optimize agricultural production/productivity from irrigated land through integrated and coordinated approach of efficient water management. In fact, this program was basically meant for development of command beyond minor outlet as Government used to take care of construction of main canal, branch canal distributaries and minors earlier under the project provision. As a result, new components such as construction of field channels and field drains, enforcement of warabandi, land leveling and shaping, strengthening of extension services etc. were taken up in the CAD Program. Subsequently, more components like farmers' participation and reclamation of waterlogged areas were included in the program with effect from 1st April, 1996 to make the program more beneficial to the farmers. Details of Plan-wise Position of Irrigation Potential Created and Utilized are given below in Table No.1:

Table 1. Details of Plan-wise Position of Irrigation Potential Created and Utilized
(Figures are in Million Ha)

Plan		Potential created			Potential Utilized		
		Major & Medium	Minor	Total	Major & Medium	Minor	Total
Upto 1951 (Pre-Plan)	Cum.	9.70	12.90	22.60	9.70	12.90	22.60
I Plan (1951-56)	During	2.50	1.16	3.66	1.28	1.16	2.44
	Cum.	12.20	14.06	26.26	10.98	1.13	25.04
II Plan (1956-61)	During	2.13	0.69	2.82	2.07	0.69	2.76
	Cum.	14.33	14.75	29.08	13.05	14.75	27.80
III Plan (1961-66)	During	2.24	2.25	4.49	2.12	2.25	4.37
	Cum.	16.57	17.00	33.57	15.17	17.00	32.17
Annul Plans (1966-69)	During	1.53	2.00	3.53	1.58	2.00	3.58
	Cum.	18.10	19.00	37.10	16.75	19.00	35.75

IV Plan (1969-74)	During	2.60	4.50	7.10	1.64	4.50	6.14
	Cum.	20.70	23.50	44.20	18.39	23.50	41.89
V Plan (1974-78)	During	4.02	3.80	7.82	2.70	3.80	6.50
	Cum.	24.72	27.30	52.02	21.09	27.30	48.39
Annual Plans (1978-80)	During	1.89	2.70	4.59	1.48	2.70	4.18
	Cum.	26.61	30.00	56.61	22.57	30.00	52.57
VI Plan (1980-85)	During	1.09	7.52	8.61	0.93	5.25	6.18
	Cum.	27.70	37.52	65.22	23.50	35.25	58.75
VII Plan (1985-90)	During	2.22	9.09	11.31	1.90	7.87	9.77
	Cum.	29.92	46.52	76.44	25.40	43.12	68.52
Annual Plans (1990-92)	During	0.82	3.74	4.56	0.85	3.42	4.27
	Cum.	30.74	50.35	81.09	26.25	46.54	72.79
VIII Plan (1992-97)	During	2.21	2.96	5.17	2.13	2.23	4.36
	Cum.	32.95	53.31	86.26	28.38	48.77	77.15
IX Plan (1997-02)	During	4.10	3.59	7.69	2.57	1.22	3.79
	Cum.	37.05	56.90	93.95	30.95	49.99	80.94
X Plan (2002-07)	During	4.59	3.20	7.79	2.73	1.49	4.22
	Cum.	41.64	60.10	101.74	33.68	51.48	85.16
XI Plan (2007-12)	During	6.34	5.45	11.79	1.33	1.43	2.76
	Cum.	47.97	65.56	113.53	35.01	52.91	87.92
XII Plan & beyond (2012-18)	During			13.20			
	Cum.			126.73			

Review of the Program implementation during the VIII and IX FY Plan periods revealed that micro level distribution network for supply of water to individual holdings had been created in about 16 million ha but rotational supply of irrigation water, i.e. warabandi could be enforced in about 11 million ha only because water was not reaching minor outlet due to deficiency in irrigation system. Apart from this, some other constraints were noticed. So, the Program was restructured for the remaining period of X Plan (2004-07) and renamed as "Command Area Development and Water Management (CADWM) Program" to make it more comprehensive and beneficial to farmers. After this, the component of "correction of system deficiencies" was included in the Program. The scheme has been implemented as a State Sector Scheme during the XI Five Year Plan (2008-09 to 2011-12) and initial two years of XII Plan.

During XII Plan, the CADWM Program was implemented pari-passu with Accelerated Irrigation Benefits Programme (AIBP). The Program is now being implemented under

Pradhan Mantri Krishi Sinchai Yojna (PMKSY) as a component of “Har Khet Ko Pani (Water to every field)” from 2015-16. The ongoing CADWM program has now been restricted to implementation of CAD works of 99 prioritized AIBP projects though at the end of FY 2015-16, there were 158 ongoing projects spread across the 29 States of the country. The evaluation made in the past has revealed that the CAD Program made positive impact on various important indicators like increase in the irrigated area, productivity and production, irrigation efficiency etc.

4. ACCELERATED IRRIGATION BENEFIT PROGRAMME (AIBP)

In mid nineties, it was found that large number of major and medium irrigation projects in the country which were taken up in fifth Five Year Plan or even prior to that were still languishing and not getting completed due to various reasons, the most important of them being inadequate provision of funds by the concerned State Governments. As a result, large amount of funds spent on these projects were locked up and the benefits envisaged at the time of formulation of project reports could not be achieved. This was a cause for concern to the whole nation and initiative was required at the national level to remedy the situation. Since the irrigation projects were capital intensive and States, with limited resources at their disposal, were not capable of handling the fund demands of such projects, the implementation of these projects got delayed.

Keeping the above in view, Central Government, during 1996-97, launched an Accelerated Irrigation Benefits Programme (AIBP) to provide Central Loan Assistance (CLA) to major/medium irrigation projects in the country, with the objective to accelerate the implementation of those projects which were beyond resource capability of the States or were in advanced stage of completion. While selecting the projects, special emphasis was given to Pre-Fifth and Fifth FY Plan projects. Priorities were also given to those projects which were benefiting Tribal and Drought Prone Areas. However, under the revised AIBP Guidelines from the year 1999-2000 onwards, Central Loan Assistance under AIBP could also be extended to minor surface irrigation projects of special category states (N.E. States & Hilly States of H. P., Sikkim, J&K, Uttaranchal and projects benefiting KBK districts of Orissa).

The release of the Central Loan Assistance (CLA) to the State Government for each project under AIBP was made in two installments in a year. The loan under the programme was being provided on the basis that the concerned State had to share, from its own resources, part of the expenditure on project components selected under AIBP. Up to March 1999, the ratio of CLA to State's share was 1:1 for General Category States and 2:1 for Special Category States while expenditure on establishment was admissible for reimbursement. As per the revised AIBP Guidelines, year 1999-2000 onwards, the ratio of CLA to State's share was 2:1 for General Category States and 3:1 for Special Category States. However, expenditure incurred on Establishment was not admissible for reimbursement under AIBP. As per further revision in AIBP guidelines effective from 02/2002, establishment cost upto 15% of CLA was admissible which was to be adjusted against the State's share.

The AIBP has been further modified by linking it with ushering of economic reforms in the irrigation sector. The States, willing to rationalize the water rates equal to the O&M costs of the projects within a period of five years were declared as Reforming States to facilitate more favorable ratio for Central Assistance for their projects. The sharing ratio for Reforming States of General Category, Centre-State was 4:1 (80%:20%), whereas that for Special Category States was 100% as Centre's share and nil for the state's share.

To further help the State Governments in accelerating the implementation of major and medium irrigation projects, the Union Government introduced the Fast Track Programme (FTP) under AIBP effective from February, 2002 to those priority projects which could be completed within one year or two working seasons. The projects were fully funded by the Centre by providing 100% loan. Under this FTP, the whole CLA of the project was to be released in two installments only. Thus, guidelines were modified number of times to suit the States and complete the projects. Again, during the 12th Plan, the guidelines were further re-modified and implemented from October, 2013. As per the new guidelines, the pari-passu implementation of Command Area Development (CAD) works were given more emphasis for the potential utilization. Later this program was also incorporated under Pradhan Mantri Krishi Sinchai Yojna (PMKSY).

5. RRR OF WATER BODIES

In India, tanks/ponds and lakes have traditionally played an important role in conserving water for meeting various needs of the community. As per 3rd Minor Irrigation Census 2000-2001, there are 5.56 Lakh tanks and storages in the country having irrigation potential of 6.27 million ha. Out of 5.56 lakh tanks, 4.71 lakh tanks are in use and remaining 0.85 lakh tanks are not in use for one reason or the other, as a result of which one million ha of irrigation potential has been lost. Many of these water bodies have gone into disuse because of the development of ground water irrigation systems, inadequate maintenance, encroachments, illegal diversion of land for construction purpose, etc. A pilot scheme for "Repair, Renovation and Restoration (RRR) of Water Bodies directly linked to Agriculture" was launched in January 2005 for implementation during the remaining period of X Plan with an outlay of Rs. 300 crores. The scheme was sanctioned in respect of 1098 water bodies in 26 districts of 15 States with a target to create 0.78 lakh ha of additional irrigation potential.

Keeping in view the success of the pilot scheme for RRR of water bodies and need for a comprehensive programme to upscale the gains from water bodies, the Ministry of Water Resources launched a State Sector Scheme for Repair, Renovation & Restoration (RRR) of water bodies with two components (i) one with external assistance and (ii) another with domestic support for implementation during XIth Plan.

Under the scheme of RRR of water bodies with domestic support, 3341 water bodies at an estimated cost of Rs. 1309.16 crore with CCA of 3.094 lakh ha was proposed to be covered. Under the scheme of RRR of water bodies with external assistance, 10887 water bodies in four States namely Odisha, Karnataka, Andhra Pradesh and Tamil Nadu, at an estimated cost 4 of Rs. 3700 crore with CCA of 8.25 lakh ha was proposed to be covered.

This program was further modified during the XII Plan but later this program was also incorporated under Pradhan Mantri Krishi Sinchai Yojna.

5.1 Pradhan Mantri Krishi Sinchai Yojna (Pmksy)

The PMKSY comprising of four main components was initially launched and approved during 2015-16 for implementation across the country with an indicative outlay of Rs.50,000 crore in five years as given in the Table 2 below:

Table 2. Projected physical target and indicative outlay (Govt. of India share)

Component of PMKSY	Implementing Ministry	Physical Target (in million ha)	Financial outlay (in Rs. crores)
2015-2020			
AIBP	WR,RD&GR	0.75	11060
Har Khet Ko Pani	WR,RD&GR	2.10	9050
Per Drop, More Crop	Agriculture	10.00	16300
Watershed Development	Rural Development	1.15	13590

5.2 Total 14.00 50000

AIBP component of PMKSY focuses on major and medium irrigation projects that involve an area of more than 2000 hectare. For area less than that Har Khet Ko Pani (Water to every field) component comes into play which includes Surface Minor Irrigation (SMI), CAD program, RRR of Water Bodies and Ground Water Development. The other two components of PMKSY – Per Drop More Crop (PDMC) and Watershed Development are implemented by Department of Agriculture Cooperation and Farmers Welfare and Department of Land Resources respectively. Thus, Pradhan Mantri Krishi Sinchayee Yojana (Prime Minister Agriculture Irrigation Program) aims to enhance physical access of water on farm and expand cultivable area under assured irrigation, improve on farm water use efficiency, introduce sustainable water conservation practices etc. That is why all the related existing programs have been brought under one Umbrella with more secured flow of fund for implementation of different programs. At the same time these programs are being vigorously monitored at the highest level, i.e., Prime Minister's Office which is giving very good results.

6. IMPACT OF IRRIGATION DEVELOPMENT ON FOODGRAIN PRODUCTION

During the period from 1951-52 to 2017-18 (66 years of planned development, India could increase irrigated area from 22.60 million hectare to 126.73 million hectare, thus registering an increase of 460% over the figure of pre-plan development. Similarly, during the same period, foodgrain production increased from 50.8 million tonnes to 277.49 million tones, thus registering an increase of 446% over the figure of pre-plan development. Foodgrain productivity which was 522 kg per hectare in 1950-51 rose to 2153 kg per hectare in the year 2016-17, registering a rise of 312%. Details of Planwise irrigation potential created and foodgrain production are given in Table No.3 given below:

If the average annual foodgrain production of each plan period or even of Annual Plan periods is seen, it is found that there is consistent rise over the previous period except in X FY Plan where the average annual foodgrain production is more or less stagnant as compared to the figure of IX FY Plan. These statistics shows that there is direct relationship between irrigated area and foodgrain production.

7. FUTURE DEVELOPMENT

Ultimate Irrigation Potential of the country is 140 million hectare whereas requirement of irrigated area to meet foodgrain requirement of 2050 (i.e. 450 million tonne) has been assessed as 160 million hectare. So, future irrigation development will continue with the same pace to achieve first the figure of Ultimate Irrigation Potential (UIP) of 140 million ha and then the figure of 160 million ha. However to bring more area over and above UIP under assured irrigation, we may have to either resort to interlinking of rivers (which has the capability to create additional irrigation of 35 million ha) or efficient methods of micro irrigation or combination of both.

Table 3. Details of Plan-wise Irrigation Created and Foodgrain Production

Plan	Cumulative Potential created (Million Hectare) at the end of the Plan	Percentage increase over Pre-plan period (1950-51)	Total Foodgrain Production (Million Tonnes) / Average annual foodgrain production	Percentage increase over Pre-plan period (1950-51)
1950-51 (Pre-Plan)	22.60	-	50.8/ (50.8)	-
I FY Plan (1951-56)	26.26	16.19	315.9 /(63.2)	12.4
II FY Plan (1956-61)	29.08	28.67	370.6/ (74.0)	45.67
III FY Plan(1961-66)	33.57	48.54	405.3/ (81.1)	60.63
Annual Plan(1966-69)	37.10	64.16	263.3/ (87.8)	72.89
IV FY Plan (1969-74)	44.20	95.58	514.8 /(102.9)	102.56
V P FY lan(1974-78)	52.02	131.06	458.4/ (114.8)	12598
Annual Plan1978-80)	56.61	150.49	241.6/ (120.8)	137.80
VI P FY Plan1980-85)	65.22	188.58	690.3/ (138.1)	171.85
VII FY Plan (1985-90)	76.44	238.23	775.1/155.0)	205.12
Annual Plan(1990-92)	81.09	258.81	344.8/ (172.2)	239.76
VIII FY Plan(1992-97)	86.26	281.68	935.0/ (187.0)	268.11
IX FY Plan(1997-02)	93.95	315.71	1015.4/ (203.1)	299.80
X FY Plan (2002-07)	101.74	350.18	1012.3/ (202.8)	299.21
XI FY Plan (2007-12)	113.53	402.35	1187.2/ (237.4)	367.32
XII FY Plan & beyond (2012-18)	126.73	460.75	1579.90 /(263.3)	418.30
2017-18	NA	460.75	277.49/(277.49)	446.70

8. FOOD SECURITY

The definition of food security adopted at the **1996 World Food Summit** held in Rome and formally endorsed at the global level is as under:

“Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”

From the above definition, four main dimensions of food security can be identified as under:

- **Physical availability of food:** The first World Food Conference focused on the problem of global production, trade and stocks. Hence the original food security debate focused on adequate supply of food and ensuring stability of

these supplies through food reserves. Subsequent food security efforts focused on food production and storage mechanisms to offset fluctuations in global supply and ensure the ability to import food when needed. Thus Food availability addresses mainly the “Supply side” of food security and is determined by the level of food production, stock levels and net trade. India’s increased foodgrain production and buffer stocks created through warehouses of Food Corporation of India satisfy this condition. Now India is in a position to supply foodgrain to any part of the country which is drought affected.

- **Economic and physical access to food:** From the early 1980s, the importance of food access was increasingly recognized as a key determinant of food security. Hence food production is just one of several means that people have to acquire the food that they need. Concerns about insufficient food access have resulted in a greater policy focus on incomes and expenditure in achieving food security objectives. This has brought food security closer to the poverty reduction agenda. Because of economic development of India, the Per Capita Income of individual has also increased considerably and people are now having sufficient money to buy foodgrains and other essential items with ease. For people below poverty line (BPL), the Government has developed a wide network of Public Distribution System (PDS) through which they can get foodgrains and other essential items at a subsidized rate. So all the people are having access to food.
- **Adequate food utilization:** This third dimension of food utilization has become increasingly prominent in food security discussions since the 1990s. Utilization is commonly understood as the way the body makes the most of various nutrients in the food. This food security dimension is determined by people’s Health status. Food security was traditionally perceived as consuming sufficient protein and energy (food quantity). The importance of micro-nutrients for a balanced and nutritious diet (food quality) is now well appreciated. Now Government is educating people through electronic media, print media and through health centres about quality of food. Though it is a continuing process, a large section of the people know what food they should prefer to eat to meet the requirement of protein, carbohydrate (energy), vitamins etc and what they should avoid. This awakening has made changes in the food habits of the most of the people. Now people are taking milk, fruits and eggs in their breakfast and meal. Consumption of fruits, chicken, mutton, poultry products and dairy products have increased so much that it has reduced the pressure on foodgrains. Thus this third condition is also satisfied.
- **Stability of the other three dimensions over time:** Above three dimensions should be stable over long time and not be affected negatively by natural (flood, draught or cyclone), social (Riot in a particular in the name of caste, religion or language, leading to non-availability of farm workers), economic (shortage of money for buying or abnormal increase in price of any particular food commodity or demonetization) or political factors(Change of Government at Centre/State and new Government bringing any new law, detrimental to the interest of farmers). For example, even if people have money (access) but food is not available in the market due to transport problem or hoarding of a particular item by some trader or due to faulty export policy (availability), people are at risk of food security. However such situation occurs for short duration only and Government takes immediate corrective to bring the situation under control. In general, aforesaid three conditions of availability, access and adequate food utilization remain stable. So this fourth condition of food security is also satisfied.

9. CONCLUSION

As is evident from the previous paragraphs, systematic irrigation development in India in the past has helped in consistent rise in foodgrain production which has, in turn, helped country in achieving self sufficiency in food as well as in creating adequate bufferstock of foodgrains to take care of drought situation in any part of the country. Apart from this, fruit production in the country has also increased to such a large extent that the prices of the fruits have now become affordable for common man. Horticultural production is more or less equal to total foodgrain production in the country. In the year 2015-16, horticultural produce (281 MT) exceeded foodgrain production (253 MT). This was not the first year but consecutive fourth year when horticulture produce exceeded agricultural production. Similarly, poultry, pisciculture, rearing of animals have also developed so fast in the country that food habits of the common man have changed. Now if you go to any rural area, you will easily find dairy products, fruits, poultry products like eggs and chicken in abundance, apart from foodgrains. In fact these products have reduced the pressure on foodgrains. Irrigation development has also role in increase in fruit production. That is why India is now in a position to export foodgrains. Further India is in a position to fulfill all the four conditions required for food security. So it is very appropriate to say that irrigation development in India is a firm step towards food security in the country.

10. REFERENCES

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