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AGRICULTURE SYSTEM IN KARNATAKA

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Introduction

1.1 Karnataka has a typical composition of having regions with most of the agro-climatic condition in the country, except the snow-clad mountainous region. A large portion of the land falls under semi-arid conditions facing severe agro-climatic and resource constraints. Interestingly, coexisting with this are a few patches of high value - high-tech agriculture. This emerged only during last two decades and has a sporadic presence in the State. Consequently, Karnataka's agriculture is at the same time diversified and segmented in many ways. Karnataka is one of the few States with the lowest proportion of their area under irrigation. Majority of farmers here have no other option but to grow low value crops. Under such speckled situation, agricultural sector of the State is growing moderately despite severe climatic and strong resource constraints. The credit for this goes to the untiring efforts of the farmers in the state. Undoubtedly, the State has the potential to emerge as one of the leading states in this sector too. However, it is a matter of deep concern that even though agriculture directly impacts the overall growth and distribution performance in the State economy, it has not been attracting investments in the recent past. Farmers are expressing the grievous situation picturesquely. It is rightly feared that the sector may confront another strong lingering of stagnation. Realising this, the State Government is seized of this problem and has decided to give a close policy look to deal with it.

1.2Contours of the Task

- ✓ Climatic Composition with varied agro-climatic situations.
- ✓ Second to Rajasthan in the Share of Drought prone area.
- ✓ One of the least irrigated regions of the nation.
- ✓ High density of low value crops.
- ✓ Faced spate of farmers' suicides.
- ✓ Large share of marginal and small farmers.

1.3 Karnataka has always taken a lead ahead of the other States in India; in many respects as far as Agricultural Policy initiatives are concerned. It became the first State in the country to have unveiled its own Agricultural Policy as early as 1995, in order to demonstrate that agriculture is a subject enshrined in the State list under the Constitution of India. Two years before that, sensing the impending stagnation in the agricultural sector, the State Government appointed a High Power Committee under the Chairmanship of Shri T R Satishchandran and the recommendations of this Committee were far reaching. The State did not lag behind any other State in preparing a document assessing the situation emerging out of Agreement on Agriculture under the WTO. Similarly, the Statehad appointed its own Agricultural Commission under the Chairmanship of Dr.R. Dwarkinath to deal with a few crucial problems confronting the sector during those years. It also has an active Agricultural Prices Commission under the Chairmanship of Dr Bisaliah to advice the State Government on agricultural prices. Further, it also became the first State to take a serious note of the distress confronting the agricultural sector that culminated in a spate of farmers' suicides. An expert Committee was appointed under the Chairmanship of Dr.G. K. Veeresh that recommended steps to remedy the situation, and the State could arrest the pace of farmers' suicides considerably. Now, with this Policy document, the State is venturing into the domain of a dynamic Agricultural Policy that hasa **'Farmer –Centric'** approach.

1.4 A decade has passed since the adoption of the Agriculture Policy document of 1995 under the stewardship of the then Chief Minister of Karnataka Shri H D Devegowda and the then Minister for Agriculture Late Shri C. Byre Gowda. Therefore, this is an appropriate time to take note of the changing situation. The State also recognizes the increasing distress in the farm sector at an alarming rate and the stagnation of net income flow in the farm sector. In real terms, during the last decade. The average size of holding is shrinking both due to demographic pressures as well as non-viability of farming among the lowest quartile of holdings. As a consequence, the farmers are becoming poorer and expressing unequivocal preference to vocations other than farming. It is also unfortunate that the esteem that the farming profession enjoyed a few decades ago has been eroding, and it is the State's responsibility to redeem it and give back the lost glory to agricultural sector.

2.Backdrop for Policy

2.1 Karnataka occupies an unenviable position of the average or the median level. From one side, this can be interpreted as an average response to the developmental initiatives and not buckling down under the pressures of acute production as well as

resource constraints. But from another, this also indicates inability to climb up in the developmental ladder despite remaining at the average level for a considerable length of time. Probably, the developmental efforts have been so critically managed that the State continues in the same position without sliding down in the hierarchy and at the same time able to climb up in comparison with other States. It is necessary that the State records its rightful potential position in any inters- State comparisons. Above all, it is the earnest desire of the farmers of the State that they require significant policy changes. Therefore, this is the right time to look back in retrospect and initiate the policy imperatives to adjust to the impending challenges and to accommodate the needs of the farmers. It is well recognised that finally, the farmers of the state can only take the responsibility to put the State at the forefront of development and consequently for the State to assure welfare of the farmers, which is of paramount importance.

2.2 Farmers in the State, as well as the country today feel completely depressed due to increased consumerism. Over the years, it has been observed that the net income of the farmers at constant prices has remained almost constant, whereas the Consumer Price Index is changing fast and this indicates that the farmers are increasingly facing distress. Undoubtedly, some of them are sliding down the poverty line, and even express their desire to quit farming. Therefore, the first imperative of the Agriculture Policy today is to provide opportunities for the farmers to enhance their net income to a respectable level. This can be achieved through various ways. Increasing aggregate production is the first and foremost need. This surely is a necessary condition, but not a sufficient condition, as markets and prices play very crucial role in deciding the net income flow to the farm household. Therefore, this policy document keeps at the forefront improving net farm income of the farmer as the prime goal. In order to achieve this, the policy document touches the aspects of crop planning, production, technology, marketing and prices as foremost components.

2.3 Psychologically, it is quite distressing that the farmers feel that they are at the lowest rung in the social hierarchy, not so much because of any social factors, but largely due to the neglect of agriculture sector, in all walks of life, besides the undue importance given to other sectors. It will be quite an important task therefore, to bring back the glory and self respect of the farming community. There are no policy tools that can achieve this directly. However, putting agriculture sector on a better path and resurrecting its importance across the sectors will go a long way in respect of agriculturists. This is another important task set forth by this policy document.

2.4Issues at Hand

- ✓ Karnataka has always been at the high level of performance across States.
- ✓ Net income of the Farmer has almost stagnated for the last decade though the consumer price index is on increase.
- ✓ Consequently, farm sector income comes under stress.
- ✓ Welfare of the Farmer is of paramount importance.
- ✓ Necessary to restore the lost social prestige of the 'Annadata'.

2.5 Agriculture sector of Karnataka has registered growth rates between two and three per cent per annum during the last three decades, but there have been a large number of saddle points due to droughts and other calamities. In order to achieve consistent income flow that records a growth rate significantly higher than the growth rate in the Consumer Price Index for Agricultural Labourers and for rural areas, it will be essential to place the target of agricultural growth rate at 4.5 per cent per annum. The 4.5 per cent growth rate in gross value of agricultural production will set the net income increase by about three per cent per annum for the farm household. This should be sufficient to take care of increasing prices of inputs, as well as the changes in the terms of trade between agriculture and non-agricultural sectors. **Therefore, it will be quite prudent to set forth a goal of 4.5 per cent per annum in the gross value of agricultural production.**

3.Philosophy and Approach

The philosophy of the present Agricultural Policy lies in the concept of 'Pancha Sutra' that was announced by the State in its budget 2006-07 for accelerated growth in agriculture. The five components of Sutra are: (i) to protect and improve soil health, (ii) Conservation of natural resources, with special emphasis on water and micro irrigation, (iii) Timely availability of credit and other inputs to the farmers, (iv) Integrate post harvest processing with the production process, and (v) Reducing the distance between 'Lab to Land' in transfer of technology. His Excellency the President of India Dr A P J Abdul Kalam during his address on 20th November 2005 to the Joint Session of the Karnataka legislature put forth a fourfold mission statement for agricultural prosperity in the State. i.e, (i) Energy Mission: Growing bio-fuel trees like Honge, Jatropha etc., in about 50 per cent of waste lands result in producing 35 lakh tonnes of bio-fuel per year to generate income of Rs. 875 crores and provide employment to 14 lakh persons, (ii) Horticulture Mission: There is need for development in irrigation, infrastructure, distribution, farm mechanization and agro processing. Horticulture Mission will result in an accrual of income of Rs. 10,000 crores with higher employment potential, (iii) Agro Processing: Karnataka is rich in Agriculture and

Horticulture produce and there is lot of scope for converting them into value added food products. This mission will provide export revenue of Rs. 50,000 crore and (iv) Water Management: There is a need to create water harvesting and wastewater recycling facilities. This is kept in view as the intrinsic goal of this policy. Keeping these and 'Farmer Centric' approach as the focal points of this policy, the State has set for itself a few major achievements in terms of goals. The policy therefore addresses more to the farmers' problems than to the technology per sent.

3.1. This is a **'Farmer Centric'** policy; therefore the process of development begins at the farm. It further covers the role of the State in terms of budgetary support and macro-economic adjustments, production and technology sector, environmental friendliness of the farmer, land issues, agro processing, associated trade and value addition to the farm products, removal of distortions in domestic market, and finally strengthening of the allied agricultural sector and linkages.

3.2. First, this policy envisages achieving a growth rate of 4.5 per cent per annum during the next decade. It is expected that this growth rate will help to increase the net income of the farmer. It will also help to bridge the income differentials between the agricultural sector and the non agricultural sectors. Employment generation in the farm sector as well as in the allied agricultural sector is the key to provide incremental income across different regions and classes of farmers. In overall policy scenario, this needs to be attended to by dovetailing employment generation in most of the programmers. Second, the policy focuses on the bypassed regions, as well as bypassed groups of farmers in the process of development adopted thus far. That will bring in the question of attending to regional disparities and providing the growth drivers for the weak regions. Third, hitherto the technological change has been 'supply driven' rather than 'demand driven'. The distance between the 'Lab to land' has always created a lag in reaching the technology at the doorsteps of farmers. Therefore, rethinking is essential in regeneration and dissemination of technological input to provide it a farmer orientation. Fourth, natural resources are under stress, whether it is soil, water or the other biological resources. It is very essential to conserve the resources and at the same time, provide better production environment. The trade-off between production and resource depletion needs to be handled carefully. Lastly, access to factor market and quality of the inputs supplied to the farmers has always been at the centre of discussion. It will be necessary to attend to these lacunae in the best possible manner.

3.3Goals of this Farmer Centric Policy

- ✓ Soil Health.
- ✓ Conservation of Natural Resources mainly land and water.
- ✓ Availability of Credit.
- ✓ Integrated Post Harvest Management.
- ✓ Lab to Land at quick pace.
- ✓ Double the agricultural production in a decade and net income of the farmer.
- ✓ Growth rate of 4.5 percent per annum.
- ✓ Shift to 'demand driven' technology from the 'supply pushed'.

4.Macro Economy of Agriculture

The macroeconomic situation of agricultural sector during last decade has not been very encouraging. Inadvertently though, agricultural sector received less than its due share of public resources as well as private investment. Similarly, the budgetary allocation to development schemes for agricultural sector has not been very satisfactory.It is essential to correct this imbalance in investment from public sources, and the budgetary allocation to the agricultural sector needs to be allocated on the basis of per hectare area or per farmer basis.

4.1. Capital investment schemes from private sector in rural areas, and especially the backward talukas identified by the Nanjundappa Committee should be encouraged. A suitable scheme, in terms of tax incentives and land incentives will be provided to such investment. However, any such enterprise will not be given good agricultural lands. More than that it will be very clear that, if the investor does not start the promised agro processing plant, within the stipulated time, the caution deposit kept while purchasing of land from the State shall be forfeited. In addition, the land purchased for the agro processing unit shall revert back to the State. Suitable legal framework has to be drafted for this purpose. This will attract investment in rural areas and especially in the backward talukas.

4.2. Various subsidies provided to the farmers under Central Schemes and Centrally Sponsored Schemes can be grouped into two separate typologies. The first typology of schemes includes those programmes that help in boosting the growth of crop economy, horticultural economy, and input sector. These schemes could be easily adopted by all farmers and economically productive on medium and large farms. Therefore, while designing such schemes, the distinction between small, marginal and large farmers should not be adhered to. It makes both the scheme as well as its implementation difficult. The second

group includes the schemes that essentially support the livelihood of small and marginal farmers. Only in these schemes, the distinction between small, marginal and large farmers should be maintained and preference should be given to them.

4.3.Macro Initiatives

- ✓ Growth rate in GSDP from agriculture at 4.5 per cent per annum.
- ✓ Budgetary plan expenditure on agriculture should be 10 per cent of total plan.
- ✓ Developmental expenditure on agriculture out of total development expenditure to double.
- ✓ Growth in Capital formation at 5 per cent per annum. Investment in Agriculture for food security.
- ✓ Investment in rural farm and non-farm enterprises to increase.
- ✓ Issue 'Raitha Mitra Pustaka' (RMP) a small coded pass book with all information of the farm family.

4.4. Net income generated in the farm sector during the last decade has shown more or less a complete stagnation in real terms. Naturally, farmers' distress has been increasing in the State like elsewhere in the country. Fortunately, the agricultural administrations in the State and the State policies have effectively controlled the spate of farmer's suicides in the State. This policy focuses on all the major reasons of distress in the farm sector of the State.

4.5 . Being a 'Farmer Centric' policy; the focus of the policy has to generate an honorable level of growth in the net income of the farmer through value addition and agro-processing. It will be necessary to increase the employment opportunities in the rural areas in farm, as well as in the non-farm sector that will supplement flow of income to the farm sector and agricultural labourers. The new income generation schemes providing opportunity to the farmers to be the drivers of their future will help to restore their self-respect and lost prestige. This will be achieved not merely through employment generation schemes, but largely through the rural industrialization programme that would have a strong link with the other sectors of the economy. Chinese could achieve success through such strategy, and it should not be difficult for the Karnataka to improve on this strategy and reap success. A farmer information book scheme called as 'Raithamitra Pusthaka' (RMP)' will be issued to each farmer. This will have information about the farmer, coded in a barcode and numerical code. The information will include particulars like name, address, land holdings, irrigation, membership of banks, societies, credit, soil type and crops grown etc. This will contain only six 4"x 3" thick papers and numerical, colour, place and bar codes will be used to save space.

4.6. Food security of the State will be of prime importance, even though we welcome the open economy model. Our food basket really comes from the rain fed region and that will be the area on which our future growth depends. The Agricultural Commission of the State will look into this aspect. In order to harmonies the agriculture relationship the State will ask the Land Use Board to have clear demarcation of zones for the purpose. This will collaborate with Land Zonation teams proposed by Dr.M.S.Swaminathan.

5.Karnataka Agriculture

5.1. Karnataka state forms the South Western part of the Deccan Peninsula and lies between 11.5°and 18.6° North latitude and 74.0° and 78.4° East longtitudes. It is the 8th largest state in the country having an area of 191,791 Sq. Kms (6.25% of India's total area of 3,065,027 Sq.Kms.).

As per the census of 2011, the State has a total population of 6.97 crores accounting for 5.13 per cent of the country's total population of 112.70 crores. The rate of growth of population in the State has declined considerably from 21.12% in 2001 to 17.25% in 2011. Sixty six per cent of the total population resides in rural areas, whose main occupation is Agriculture and allied activities.

5.2. Out of the total population, 44.6 per cent is working population, of which 69.36 lakh are cultivators and 62.09 lakh are agricultural labourers. One important feature, of agricultural labourers is that the percentage of women (58.19%) overrides the percentage of men (41.81%). The literacy rate of the State is 67.04 per cent, while in rural areas it is 59.68% and that of urban areas it is 81.05 per cent. The State has 30 districts, 206 taluks, 785 hoblies, 29,483 Villages (27,575 inhabited and 1908 uninhabited) and 5892 grama panchayaths.

6.Karnataka Agriculture Census 2010-2011

6.1 As per the Agricultural Census of 2010-11, the State has about 123.07 lakh hectares of cultivable area out of total geographical area of 190.50 lakh hectares, accounting for 64.60 per cent. The total number of operational holdings is 70.79 lakhs with 1.74 hectares, as average size operational holding. Small and marginal farmers account for 72.9 per cent of the total holdings, cultivating only 34.4 per cent of the total cultivable area. The number of holdings increased by 8.58 lakhs due to fragmentation of the land in the last five years. The average size of holding has decreased from 1.95 hectares to 1.74 hectares.

6.2. Out of the total cultivable area of 123.07 lakh hectares, as per the statistics of 2005-06, the net cultivated area was 104.31 lakh hectares and the gross cultivated area was 116.70 lakh hectares, indicating a cropping intensity of 116 per cent. Out of the gross cultivated area, the area under irrigation was 30.89 lakh hectares (26.5%).

The State is divided into 10 Agro-climatic zones on the basis of soil structure, humidity, elevation, topography, vegetation, rainfall and other agro-climatic factors.

6.3. The State receives normal annual rainfall of 1139 mm, mainly through southwest monsoon (June to September – 806 mm) and Northeast monsoon (October to December – 195 mm). The rainfall during post monsoon period, i.e January- March is about 14 mm and in pre-monsoon period, (April to May) it is 124mm. Accordingly, the state has three agricultural seasons – KHARIF (April to September), RABI (October to December) and SUMMER (January to March).

6.4. Agricultural crops are cultivated in an area of about 107 lakh hectares annually. Out of this, in Kharif season it is about 69 lakh hectares (64%), in Rabi season it is about 32 lakh hectares (30%) and the rest 6 lakh hectares (6%) come in summer season. Out of gross cultivated area of agricultural crops an area of about 22 lakh hectares (20.5%) comes under irrigation.

6.5. Karnataka State with a foodgrains production of about 100 lakh tonnes contributes nearly 5 per cent to the national foodgrains production. However, owing to successive droughts during the last three years (2008 – 09 to 2010 - 11) the foodgrains production had decreased substantially.

1.Irrigation: Precious Needs to be well Managed.

Agriculture being the main occupation of the State, Irrigation plays a significant role in increasing the yields from the land. The development of irrigation in the State was slow and unsystematic during the pre-independence era. However, there were some notable irrigation works undertaken and completed during the pre-independence period such as Krishnaraja sagar (which was the only major project completed prior to independence,) Vijayanagar canals, Cauvery anicut channels, Gokak canal, Vanivilas Sagar, Marconahalli and Anjanapur. Though major projects like Tungabhadra, Bhadra and Ghataprabha stage -1 were commenced prior to the plan period, their progress was slow and they got impetus only after their inclusion in the First Five Year Plan. There were more than 25,000 tanks scattered over the erstwhile Mysore State, but in the Bombay-Karnataka and Hyderabad –Karnataka areas, the number of such minor irrigation works was less.

1.1. Irrigation is classified mainly into two broad categories. (1) Flow irrigation (2) lift irrigation. Depending upon the extent of irrigation potential, these are further classified into major, medium and minor categories. Along with natural streams, the other sources of irrigation are mainly reservoirs, dams/anicut, tank, pickups, bandaras and open & tube wells. The stagnation of productivity in irrigated areas is due to lack of implementing updated scientific water management techniques and proper awareness among the beneficiary water users. Independent well irrigation system is being adopted wherever required to the maximum extent. As a result, groundwater table has been going down, and the State has the dubious distinction of housing the highest number of 'grey blocks (over exploited groundwater regions)' in the country Similarly, tanks have fallen in disuse, and only recently, a massive project to rejuvenate tank irrigation in the State has been taken up. Even after completion of this project, well irrigation will continue to be the major source of irrigation.

1.2.Status of Major& Medium Irrigation Projects in Karnataka as on March 2011 (in Rs.lakhs)

Particulars	**No. of irrigation projects**	**Administration Approved cost**	**Present Cost**	**Present Cost Exp. Upto 3/2011**	**Balance**
Completed	42	14858.38	17195.28	17195.28	0
Ongoing	55	2867872.48	2867872.48	1813584	1054288.48
New	19	51582.00	52921.00	112.54	58808.46
Total	**116**	**1063974.48**	**2937988.66**	**1830891.82**	**1107096.94**

Source: Water Resources Department, Government of Karnataka, Bangalore.

1.3. As per state water policy 2002, the Ultimate irrigation potential planned is 61 lakh ha., consisting of 35 lakh ha. from major and medium irrigation, 10 lakh ha. from minor irrigation and 16 lakh ha. from ground water source. A potential of 21.97 lakh ha. has been created under major and medium irrigation projects up to end of March 2011. The average annual yield of all the rivers of Karnataka has been roughly estimated as 3438 TMC. The State has prepared master plans for various river basins. According to these plans, the likely total utilization under major, medium and minor irrigation projects using surface water is 1690.30 TMC.

Krishna basin	1156.00	TMC
Cauvery basin	408.62	TMC
Godavari basin	22.37	TMC
Other Basins	103.31	TMC
Total	**1690.30**	**TMC**

1.4.Achievements up to end of March 2011.

The total investment upto end of March 2011 on major and medium irrigation projects in the State is Rs.24,272.51 crores. This does not include the investment made on irrigation projects prior to the plan period (prior to 1951). Since inception and upto end of March 2006, a total irrigation potential of 21.97 lakh ha. has been created under major & medium irrigation projects as hereunder. 4,59,571 ha. under 8 Major and 34 medium completed projects. 17,38,058 ha. under 23 major and 32 medium ongoing projects. From First Plan period to Ninth plan period, a cumulative expenditure of Rs. 15,684.48 crores has been incurred on major & medium irrigation projects and an irrigation potential of 19.05 lakh hectares has been created. During Tenth plan period and upto end of March 2006 an expenditure of Rs. 12,354.29 crore has been incurred and an irrigation potential of 2.92 lakh hectares has been created. For financing irrigation development, Karnataka has established five Neeravari Nigams out of which three, namely Krishna Bhagya Jala Nigama Limited (KBJNL), Karnataka Neeravari Nigama Limited (KNNL) & Cauvery Neeravari Nigama Limited (CNNL) are active and the other two namely Lift Irrigation Corporation (North) and Lift Irrigation Corporation (South) are inactive. Krishna Bhagya Jala Nigama Limited (KBJNL) was incorporated during 1994 to expedite the works of Upper Krishna Project and it started functioning w.e.f. 19.08.1994. Similarly, in order to expedite the completion of the projects in Krishna basin, other than the Upper Krishan project, Karnataka Neeravari Nigama Limited (KNNL) was incorporated as a special purpose vehicle, which started functioning w.e.f. November 1998. The Cauvery Neeravari Nigama Limited (CNNL) was incorporated during the year 2003 and it started functioning w.e.f. June 2003 in order to ensure repair, renovation & re-furburishment of the irrigation assets and to ensure economic use of available water within the legal framework of the interim award of CWDT in the Cauvery basin. These Nigams have been borrowing from the market through the issue of long term bonds. Irrigation projects have been handled by 6 Command Area Development Authorities (CADA) and since its inception an area of 1541009 ha. has been irrigated through participatory irrigation Management, by forming Water Users Co-operative Societies (WUCS). As on September 2006, 2353 WUCS has been established against a target of 2945 WUCS. Minor irrigation constitutes 46 percent and canals 40 percent of the total irrigated area. The State has energized 8.7 lakh irrigation pump sets and they account for 42 percent of the total power consumption of the state. Capital disbursements of plan outlays by the State have come down to 27 percent (1988-89) from 34 percent (1980-81). But there is a 75 percent increase (from 1980-81 to 1988-89) in non-plan expenditure on major and medium irrigation projects of the State. Keeping in view the discussion, the following policy steps are recommended.

1.5.Irrigation Development

- Planned ultimate irrigation potential 35 lakh .from major and medium irrigation.
- Potential of 21.97 lakh has. has been created under major and medium irrigation projects
- Ongoing projects: 55. Investment required Rs. 10543 corers.
- According to master plans, the likely total utilization under major medium and minor irrigation projects using surface water is 1690.30 TMC.

2 .Major Irrigation Schemes

2.1. There are a number of irrigation projects at various levels of completion in the State and this need to be taken on priority. Large amount of investible resources are locked up in these projects and the gains therefrom have been negligible.

2.2. The present level of allocation of funds for irrigation projects is too meagre compared to the outlay required for completion of the existing projects. The delay is due to taking up too many projects compared to limited availability of funds, resulting in cost escalation. There is need to augment the resources for speedy completion of the projects. Future preparation of irrigation projects will be based on the realistic ex-ante evaluation and detailed economic appraisals. These should be publicized to generate a favourable climate for implementation. A clear programme of completion of these projects prepared by the irrigation department along with the investment required will be presented to the government in order to take this on top priority.

2.3. Participatory Irrigation Management will be encouraged by strengthening and monitoring of participatory Irrigation Management and by capacity building of Water User's Societies (WUS) . This will bring about awareness of their rights, roles and responsibilities in effective utilization and monitoring of water allotted to them.

2.4. The concept of rotational water supply system is followed throughtout the country since many decades. It is also a part of the National Water Policy. 2002. This needs to be adopted for efficient use of water. The rationale behind rotational water supply system is that most of the crops do not require irrigation everyday. They need irrigation once in 8-20 days depending on nature of crop and type of soil. Rotational Water Supply system envisages that if water is allowed in a canal for 15-20 days followed by a gap of 10-15 days, more land could be irrigated with the available water. Similarly, with different dates of sowing for different crops in a command of distributaries, all the farmers can irrigate their lands. This will be enable the tail-enders to get the benefit of irrigation.

2.5. Implementation of "On and Off"system-Strict implementation of 'on and off' system of irrigation by imposition of localization and improvement of operating system will be taken up on priority.

3 .Minor Irrigation (Tank Irrigation etc.)

Tank irrigation is the most dependable and environment friendly irrigation system. It combines advantages of the well irrigation and canal irrigation and at the same time keeps out the usual negative externalities in these two sources. If water use efficiency is put in place in tank irrigated area and the tanks in disuse are brought back to life, this source of irrigation will give better returns per unit of water. These returns will be free of negative environmental externalities. Desilting of tanks has been taken up under a special programme by the state government.

3.1. The management of tank irrigation should be handed over to Gram Panchayats. It is recommended that WUAs IN TANK COMMAND AREAS BE FORMED. Where the area of operation exceeds 1000 ha., formation of separate WUAs based on hydraulic unit may be considered. In Lift irrigation schemes too, such WUAs should be formed. Most farmers in tank-irrigated area depend solely on tank water for absolute irrigated crops. But WUAs should encourage the conjunctive use of water by utilizing rain water in command areas to meet the initial needs of crops.

3. 2 Cultivation of high water consuming crops like paddy and sugarcane under tank and lift irrigation projects will be discouraged and these will be replaced by crops of high water use efficiency and better economic returns.

3.3 Revitalising Irrigation

- Completion of the incomplete Projects
- Implementation of "On-Off" system.
- Particularly Irrigation Management through WUAs in canal and tank command areas.
- Tank to be regenerated and managed by Panchayats.
- Diversification of cropping pattern.
- Shifting to less Water Consuming methods like SRI.
- Revision of water rates.
- Piped water delivery system.
- Catchment of area treatment in for tanks.
- Community based recharge of ground water
- Discouraging deep tube wells.
- Micro-Irrigation as the first priority.