2.0 PROFILE OF THE SAMPLE TANKS

2.1 Overview

As mentioned in the previous chapter, 187 tanks covered by the KCBTMP have been selected for the study, followed by 35 tanks, outside the project coverage, as control. A brief profile of these tanks is presented in this chapter. This will enable to understand the detailed impact analysis presented in the subsequent chapters in proper perspective. The sample tanks have been classified into two groups based on their designed command area. The tanks with a command area of 40 hectares and below come under the jurisdiction of the Zilla panchayats (ZPs) and those with a command area of 41 hectares and above (upto 2000 hectares) come under Minor irrigation (MI) department, Government of Karnataka. This classification was done with a view to examine the economies of scale, if any, in rehabilitating the tank systems under the project, the details of which are presented in Table 2.1.

It could be seen from the data presented above, the ZP tanks (40 hectares and below) account for about 69 per cent of the sample tanks covered by the project and the remaining are MI tanks, with more than 40 hectares command. On the other hand, about 82 per cent of the control tanks are ZP tanks and the remaining ones are MI tanks. More than two-thirds of the sample tanks (both project and control) are small ones, the command area of which varies from 4.1 hectares to 40 hectares. The investment scale and the dynamics of operation tend to be different when compared to MI tanks, the details of which will be discussed in the subsequent chapters.

Across the zones, the concentration of ZP sample tanks is more in EDZ (89.9 per cent) and NEDZ (83.3 percent). The spread of MI sample tanks is the highest in NETZ (100 percent), followed by 50 percent in EDZ, and 57 percent in NTZ.

Given the spread and concentration of sample tanks across the project area, the status of water storage in those tanks is examined and presented.

Table 2.1 – Distribution of Project and Control Tanks According to the size of designed Command Area - zone-wise

ZONE	Project/ Control	Average per Tank (Ha)		
		ZP tanks (upto 40 hect)	MI tanks (Above 40 hect)	Total
CDZ	Project	20 (50)	20 (50)	40 (100)
	Control	4 (50.0)	4 (50.0)	8 (100)
EDZ	Project	80 (89.9)	9 (10.1)	95 (100)
	Control	20 (100.0)	-	20 (100)
NDZ	Project	8 (38.1)	13 (61.9)	21 (100)
	Control	1 (100)	-	1 (100)
NEDZ	Project	10 (83.3)	2 (16.7)	12 (100)
	Control	3 (100)	-	3 (100)
NETZ	Project	0	4 (100)	4 (100)
	Control	0	1 (100)	1 (100)
NTZ	Project	12 (57.1)	9 (42.9)	21 (100)
	Control		2 (100)	2 (100)
Total	**Project**	**130 (69.5)**	**57 (30.5)**	**187 (100)**
	Control	**28 (82.9)**	**7 (17.1)**	**35 (100)**

Note: Figures in parentheses are percentages.

2.2 Water storage in the sample tanks

- The intensity of water flow into the tanks depends upon a number of factors. The nature of catchment area in terms of soil characteristics, land slope, vegetative cover, land use pattern and other associated practices will influence the run off, depending upon the intensity and spread of rainfall in a given period of time. Watershed programmes taken up in the catchment areas also affect adversely the run off into tanks, because of water harvesting structures constructed. Further more, encroachment of feeder channels by the neighbouring farmers, siltation and weed infestation due to lack of periodic repairs and maintenance will also reduce the water flow into the tanks. Feeder channels treatment was, therefore, one of the major activities in the KCBTMP taken up for tank systems rehabilitation. Many of the sample tanks have received relatively more water after improving the feeder channels. The status of the tank filling among the sample tanks is presented in the Table 2.2.

- The survey data presented in Table 2.2, shows, about 38 percent of the MI tanks covered by the project have received full storage and surplused, as against only 25 percent of the ZP tanks, though the ZP tanks designed storage capacity is much less than the MI tanks, the number of tanks surplused was only 33 (25.4 percent). On the other hand, one-third of the control MI tanks have received full storage and 17.3 percent of the ZP tanks has received full storage. The number of tanks which have received less than 50 percent storage among the sample MI tanks has been 28 out 57 (49.1 percent) and that of ZP tanks it is 80 out of 130 (61.5 percent). The percentage of project MI tanks receiving between 50 to 90 percent storage has been about 12 percent and that of control tanks 50 percent. In the case of ZP tanks this percentage is 13.1 and 3.4 respectively.

Table: 2.2 – Zone-wise distribution of sample tanks by size of Command Area and Filling Status (2007-08)

		MI				ZP				Total
ZONE		**No. Of Tanks**	**<50**	**51-90**	**91-Above**	**No. Of Tanks**	**<50**	**51-90**	**91-Above**	
CDZ	**Project**	20 (50.0)	14 (70)	4 (20)	2 (10)	20 (50.0)	11 (55)	4 (20)	5 (25)	40 (100)
	Control	4 (50.0)	1 (25)	3 (75)		4 (50.0)	3 (75)		1 (25)	8 (100)
EDZ	**Project**	9 (10.1)	09 (100)	0	0	80 (89.9)	65 (81.21)	9 (11.31)	6 (7.5)	80 (100)
	Control					20	20 (100)			20 (100)
NDZ	**Project**	13 (61.9)	4 (30.81)	2 (15.41)	7 (53.8)	8 (38.1)	4 (50)	2 (25)	2 (25)	21 (100)
	Control					1			1 (100)	1 (100)
NEDZ	**Project**	2 (16.7)	0	0	2 (100)	10 (83.3)	0	2 (20)	8 (80)	12 (100)
	Control					3		1 (33.34)	2 (66.66)	3 (100)
NETZ	**Project**	4 (100.0)	01 (25)	01 (25)	2 (50)	0	0	0	0	4 (100)
	Control	1 (100.0)			1 (100)					1 (100)
NTZ	**Project**	9 (42.9)	0	0	09 (100)	12 (57.1)	0	0	12 (100)	21 (100)
	Control	1 (50.0)			1 (100)	1 (50.0)			1 (100)	2 (100)
Total	**Project**	**57 (30.5)**	**28 (49.11)**	**7 (12.31)**	**22 (38.61)**	**130 (69.5)**	**80 (61.51)**	**17 (13.11)**	**33 (25.4)**	**187 (100)**
	Control	**6 (17.1)**	**1 (16.71)**	**3 (50)**	**2 (33.31)**	**29 (82.9)**	**23 (79.3)**	**1 (3.47)**	**5 (17.3)**	**35 (100)**

Note: Figures in parentheses are percentages

MI – Minor Irrigation Tanks – 41 to 2000 hectares of Command area

ZP – Zillapanchayat Tanks – Less than 40 hectares of Command area

- Across the zones, the percentage of sample ZP tanks which have received full storage has been marginal in CDZ, EDZ and NDZ, while it is significantly high in the remaining three Zones, ranging from 80 percent in NEDZ and 100 percent in NTZ. Same is the case with MI tanks in the respective zones. It was mainly because of the good rainfall during the year under reference. In most of the taluks in these zones, the rainfall was above normal. Since the project objective is to improve the livelihoods of rural people through improved agricultural production, the impact of the project could hardly be realized in the areas where tanks have not been filled fully. While the impact of the project has been more visible in the areas where tanks were full, the same can not be traced where tanks have not received full storage. This aspect needs to be kept in view, when the project impacts are discussed in the subsequent chapters. The fact should not be lost sight of that if the tanks are in shipshape with desilting and bund / outlet maintenance done, in the years of good rainfall they reap the benefit of full storage being available.

- It is expected, after rehabilitation of the tanks under KCBTMP, the area under irrigation in the command area will increase due to the restoration of live storage, which had apparently reduced because of siltation. It will also help to increase the intensity of cropping and productivity of crops. In order to capture these expected outcomes, the necessary condition is the tanks should have received full storage. Then only the full realistic outcome could be measured. Since majority of our sample tanks have not been filled in the reference year, it is but natural that the outcomes will not be upto the expected levels. However, more than one-third of our sample tanks had surplused during the year under reference. This will help capturing the realistic outcomes and projecting the total benefits of the project, based on the outcomes of these tanks.

2.3 Characteristics of Sample Tanks

- A brief account of the physical characteristics of sample tanks in terms of command area, catchment area, water spread area etc; is presented. The data have been collected from the tank records and other related documents. The details are presented in Table 2.3.

- As seen from the data presented in Table 2.3, the average command area per sample tank works out to 37.7 hectares. The catchment area per tank is about 1000 hect, and the water spread area is 56.6ha. However, the number of small tanks with less than 40 hectares (ZP tanks) is more, when compared to large tanks (MI tanks). The average water spread area per tank is 56.6 hect. It is relatively more in CDZ, with 164 hect and the lowest is in NTZ with 9.8 hect. It is 63.6 in CDZ, followed by 7.9 in NETZ, 33.7 in EDZ, and 11.6 in NEDZ.

- The average size of command area per sample MI tank is 83 hect, and that of ZP tank 18 hect. It varies from 123 hect in NDZ to 53 hect in NEDZ. Similarly, the average catchment area per sample MI tank is 1088 hect and that of ZP tank it is 259 hect. Across the zones it varies from 3852 hect in NETZ to 896 in CDZ.

- The water flow into the tanks depends upon the size of the catchment and its condition in terms of soil characteristics, land use pattern, cropping pattern, forest coverage etc; In order to know the run off potential into the tanks the command catchment ratio has been worked out. While the average command catchment ratio of MI tanks works out to 24, it is 14.5 for ZP tanks. The ratio is more favorable in the case of MI tanks than that of ZP tanks. Across the zones, the MI tanks in NETZ have relatively higher command - catchment ratio (1:47.5), and in the case of NTZ it is only 1:3.7. On the other hand, the ZP tanks in NDZ have 43.8 catchment ratio,

which is the highest. The lowest is in NTZ with only 3.7. The tanks in this zone are mostly located in cascades. That is the reason for relatively lesser catchment ratio in this zone. Because of the high rainfall in the region, tanks receive water every year.

- Regarding the water spread area of the sample tanks, the tanks in CDZ have 164 hect. water spread per tank. On the other hand, the tanks in NEZ and NETZ have lesser water spread area with 9.5 and 7.9 hect. respectively.

- In the case of control tanks, the average command area per sample MI tanks is 83.7 hect. And that of ZP tanks 13.6 hect. Water spread area of the MI tanks is 64 hect. and ZP tanks 22.7 hect. The catchment area of MI control tanks is relatively higher than that of project tanks. The catchment of ZP tanks is more or less same as that of project tanks, with command catchment ratio of 14.5 and 18.3 respectively.

The salient features of the sample tanks presented above helps understanding various impacts of the project, which will be presented in the subsequent chapters.