

***CONCURRENT EVALUATION
OF
WADI PROJECT
IMPLEMENTED IN ORISSA***

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I hope this report will be helpful to the ITDA officials, NGOs and Administrative Department for better implementation of the WADI Project, which has been introduced only recently by the Ministry of Tribal Affairs and the State Government on a joint venture.

Project Advisor

Concurrent Evaluation of *WADI* Project in Orissa

Executive Summary

Objectives, Scope and Methodology

The *WADI*, literally stands for a composite farming system, is an effective approach for holistic development and generates livelihood through a combination of core interventions of horticulture, forestry and agricultural development along with soil and water conservation and water resource development.

The wider objective of the *WADI* project is to stabilize the livelihood of participating tribal communities through reduction of poverty.

To assess the progress of :

- (i) Implementation of eco-friendly income generating activities through establishment of orchard of the selected fruit crops.
- (ii) Intercropping and agro-forestry plantation for immediate project output, income generation and soil & water conservation.
- (iii) Development of water sources to provide protective irrigation to fruit plants during the critical period.
- (iv) Formation of people's organizations.
- (v) Scope of participation of women in development process.
- (vi) Scope of employment generation in project areas.
- (vii) Financial achievement of the project.

Execution

G.Udayagiri and Tikabali, the two blocks under Balliguda ITDA have been selected for implementation of *WADI* project. Under the project 1000 tribal families @ 500 from each block have been covered. The Project Implementing Agency was given freedom to select the villages and families in the blocks stipulating to some criteria, which include:

- Small and marginal farmers of ST communities owning not more than 5 acres of land.
- Annual income of the family should not be more than Rs.39500.
- The support from the project to the extent of development of maximum one acre per family.

It was decided to execute the programme starting from selection of villages, beneficiaries to planting and capacity building through the NGOs and accordingly 3 NGOs namely, Phulbani Rural Development and Technology Agency (PRDATA), Social Welfare and Training Institute (SWATI) and SAMANWITA were approved by the Collector, Kandhamal as executing agencies.

Methodology

The study was conducted during June-July, 2008 in Balliguda ITDA area covering both G.Udayagiri and Tikabali block where the project has been executed. Multistage sampling has been used to select the GPs, villages and beneficiaries.

Collection of Data

Data have been collected from primary as well as secondary sources. The primary sources data were collected from the beneficiaries of *WADI* project through personal interview, group discussion and village schedule. Besides, case studies were also conducted at the village level. Secondary sources data were collected mainly from the ITDA.

Features of the Study area

Almost all of the 20 villages are situated at foothill and the housing pattern is scattered type excepting linear pattern in only 3 villages. All the villages are situated close to the forest area. Out of 20 sample villages, three has been electrified and the villagers use for domestic purpose. Each village is provided either with cement concrete road/ pucca road. Since the villages are located close to the forest, cottage industry like leaf plate making is seen in all the villages.

Demographic Profile

Literacy rate in the project area is 57% where as Tikabali block has the higher literacy rate of 64% and that of G.Udayagiri is 50%. Out of the total population, the female literacy is 23% who has a major role in adopting the innovative technologies in the *WADI* field for maintenance and irrigation.

The average workforce available from each household is 3.12, which accounts to 88% of the adult population. The male and female workforce accounts to 90% and 85% of the adult population respectively. The average land holding per household is 2.22 acres, which includes 1.34 hectare of encroachment of forestland and put to agriculture use.

Present Status of the Project

The sample beneficiaries have planted 2000 mango grafts including 1600 *Amrapalli* and 400 *Dusseri* and 766 litchi *gooties*. The average mortality for both mango and litchi is 36% where as mortality of litchi is higher in comparison to mango, which accounts to 61% against 26% of mango. It is observed that litchi is a delicate crop and needs much more care in comparison to mango. The beneficiaries need more training to take proper care of litchi as well as mango to reduce the rate of mortality. The ITDA and the NGOs have taken steps for gap filling during the *Kharif*, 2008.

Out of 40 sample beneficiaries, 17 have provided pitcher irrigation with the pitchers supplied by the ITDA through the NGOs. All the 40 beneficiaries have provided tree guard and only 10 have provided fencing which accounts to 25% only. All the beneficiaries took proper care for digging of recommended size of pits and have applied organic manure for healthy growth of the plants. Out of 40 sample beneficiaries, 55% have got the passbook. The NGOs were advised to immediately issue the passbooks and maintain properly.

Providing irrigation to the *WADI* field is a major constraint that led to higher rate of mortality of the plants. In most of the cases it was observed that water is not available near the *WADI* fields. The beneficiaries use different sources like tube well, dug well, stream or *chuan* and perennial *nala*. In Tikabali block, SWATI, the NGO has started execution of a few dug wells for irrigation to *WADI* field.

The total expenditure of Rs.52,84,530/- has been incurred during 2007-08 which accounts to 88% of the total allotment of Rs.60,34,000. The

expenditure under infrastructure development will be incurred during winter for execution of water sources like dug wells for irrigation purpose.

The earmarked estimate for one acre *WADI* project for first year of the project period is Rs.7668/-, which includes Rs.6134/- of Government share and Rs.1534/- of Farmer's share. Government share of Rs.6134/- includes the cost of the inputs, transportation, incentive to farmers for green fencing, IEC, training, capacity building and miscellaneous expenditure. The farmer's share of Rs.1534/- is adjusted towards the labour rendered by the beneficiary.

Implementation of the Programme

The first meeting was held at Secretariat, Bhubaneswar under the chairmanship of the Commissioner-cum-Secretary, STSC Development Department, Government of Orissa on 12th July, 2007 where decision was taken to launch the programme immediately. In the review meeting held on 21st July, 2007 under the chairmanship of the Collector, Kandhamal, the operational modalities were decided and a Technical Committee was formed for execution of the programme through 3 NGOs.

The NGOs developed awareness among the tribal communities for their enrolment as *WADI* beneficiaries through wide publication in newspapers, leaflets and posters. The NGOs invited applications from the willing farmers having uncultivated high land of minimum one acre belonging to tribal community and BPL category.

The Project Administrator, ITDA, Balliguda took initiative to procure the planting materials of mango and litchi and distribution started from 3rd August and 18th August, 2007 and completed on 7th September and 12th September, 2007 respectively. Plantation started from 15th August, 2007 by the NGOs in their area of operation. Planting continued till late *Kharif*, which caused higher mortality of the plants. Keeping in view the higher rate of mortality during transit from a long distance as well as after plantation, PA, ITDA, Balliguda, in consultation with the executing NGOs as per their field survey, has placed

indent of 19,800 *Amrapalli*, 5200 Dusseri variety of mango grafts and 10,200 litchi *gooties* for gap filling during the second year i.e. kharif 2008.

The NGOs, through their volunteers, have taken care for organizing workshops and imparting necessary trainings and guidance to the beneficiaries. Beneficiaries expressed their satisfaction regarding presence of the volunteers and providing guidance during pit digging and plantation.

Inter Cropping

As per the decision taken in the review meeting held on 6th September, 2007 at Samanwita, G.Udayagiri under the chairmanship of the Collector, Kandhamal, the NGOs took steps for inter-cropping in 880 acres. The ITDA *Balliguda* procured 52.80 Q black gram seeds from Orissa State Seeds Corporation (OSSC) for inter-cropping on 18.09.2007 and supplied to the NGOs next day.

It is learnt from the beneficiaries during field visit that there was 100% crop loss in most of the cases due to unavailability of soil moisture because of late sowing i.e. during the last part of September. In a few cases, although the crop survived, but the yield was meagre as stated by the beneficiaries. A sum of Rs.5,11,670/- has been spent out of the allotted amount of Rs.7,56,000/- towards cost of seeds (Rs.3,03,970), fertilizers, rhizobium culture & plant protection chemicals (Rs.1,95,000) and transportation (Rs.12,700). ITDA is taking steps to supply cowpea/ green gram seeds during *Kharif* 2008 utilising the available resources to compensate the loss of black gram.

It was also decided to grow papaya and drumstick as intercropping but it was not taken up during 2007 as the seedlings could not be arranged. Steps have been taken to grow papaya and drumstick as intercropping during *Kharif* 2008.

Agro-Forestry

A sum of Rs.6,00,000/- has been allotted for the year 2007-08 @ Rs.600/- per *WADI* for agro-forestry. The Technical Committee, on 30th July, 2007, took the decision for plantation of *Subabool* and Bamboo stumps which

were to be procured from different nurseries of J.K. Paper Mill, Rayagada. The Technical Committee was worried for delay in plantation of the same and suggested to complete the plantation by 20th August, 2007. But procurement of the stumps started on 1st of September and completed on 10th September, 2007.

The ITDA personnel have also distributed the stumps to the concerned NGOs either on the same day of receipt of the stock or the next day. The ITDA has procured 2,53,000 stumps @ Re.1/- per stump and incurred an expenditure of Rs.2,84,980/- including transportation. During the field visit no bamboo or *subabool* plants were observed under Agro-forestry component. It was ascertained from the beneficiaries that the stumps were supplied and planted but did not survive because of late plantation i.e. during last part of *Kharif* season. Also the mortality was high because of transportation from a long distance and proper care could not be taken by the NGOs during stocking of the planting materials at their level due to lack of adequate technical knowledge. ITDA personnel has taken steps for plantation of agro-forestry species like bamboo, *subabool* and shimarouba utilising the balance amount of Rs.3,15,020/- under the agro-forestry component during the 2nd year.

Recommendations

1. Procurement of mango grafts and litchi *gooties* to be done immediately for gap filling keeping in view the mortality of last year and the indent placed by the NGOs.
2. NGOs to take immediate steps for digging of pits for gap filling.
3. Adequate training to the beneficiaries by the experts of KVK and Horticulture Department to take proper care of the plants especially litchi to reduce the mortality rate.
4. Supply of cowpea/ green gram/ black gram seeds for intercropping to compensate the loss of black gram during last year to be taken up as intercropping.

5. Arrangement of seedlings of papaya and drumstick well ahead of *Kharif* season and planting of the same after receiving the early shower as intercropping.
6. Steps to be taken for plantation of agro-forestry species like bamboo, *subabool* and *shimarouba* utilising the balance amount of Rs.3,15,020/- under the agro-forestry component during the 2nd year. Adequate care should be taken to minimize the transit loss and the NGOs are to be provided proper guidance in this regard with the assistance of the experts from KVK.
7. Fencing and tree guards to be provided by the beneficiaries to protect the plants from cattle menace.
8. The NGOs are to be given technical guidance and funds to be provided by the ITDA to create irrigation source just after rainy season utilising the funds available under infrastructure development.
9. Proper monitoring of the programme through field visits by constituting two technical groups one each for G.Udayagiri and Tikabali block with participation of experts from Krishi Vigyan Kendra (G.Udayagiri), Horticulture wing (G.Udayagiri), Welfare Extension Officer of concerned blocks, Junior Agriculture Officer of ITDA and representatives of the concerned NGOs.
10. The NGOs to take immediate steps to constitute Common Village Fund with the participation of the beneficiaries as it has been constituted in Sapaganda village of Paburia GP in Tikabali block by SWATI, the NGO.
11. The Managing Director, Orissa SCST Financial Development Corporation (OSFDC) may organize training camp at G.Udayagiri for the government officials and the NGOs for better understanding of the scheme for sanction and disbursement of loan to WADI beneficiaries and landless farmers from WADI area.
12. The ITDA may consider engaging one semi-skilled labourer to assist the Jr. Agriculture Officer of the ITDA to assist him in the field work on contractual basis during the current financial year.

* * *

Chapter – 1

Introduction & Profile of the Project Area

Introduction

Orissa is regarded as the homeland of Tribal having a total tribal population of about 7 million, which is 22.21% of the State's total population according to 2001 population. The State has the third highest tribal population in the entire country, which accounts to roughly 11% of the total population. Most of the tribal communities are confined to the hilly and remote areas of the State. They have a life style characterized by close dependency on the forest for shifting cultivation, collection of forest produce and hunting. The average literacy rate among tribals is 22.3%.

The tribal economy in Orissa state is primarily subsistence oriented and based upon a combination of agriculture, forestry and wage labour. Although tribals are mainly dependent on agriculture, collection of forest produce continues to play a major role in household consumption and income generation. But in areas of serious deforestation, collection of forest produce is now of declining importance for tribal economy. In other areas, cash earning from non-timber forest produce such as *sal* and *kendu* leaf is still of greater importance for the household economy. With the decline in output from forest produce as well as shifting cultivation, tribals are increasingly dependent on wage labour, both agriculture and unskilled infrastructure development work.

Tribal women play an active role in both household affairs and also in providing economic input for survival of families. They contribute major part of the family labour. In social and household matters, the status of tribal women is generally higher than that of non-tribal women.

In view of the complexities attached with tribal way of life, due to their historical, socio-cultural and geographical situations, the generalized approaches of development attempted earlier have not met with significant success. Nevertheless, efforts made by some government and NGOs in

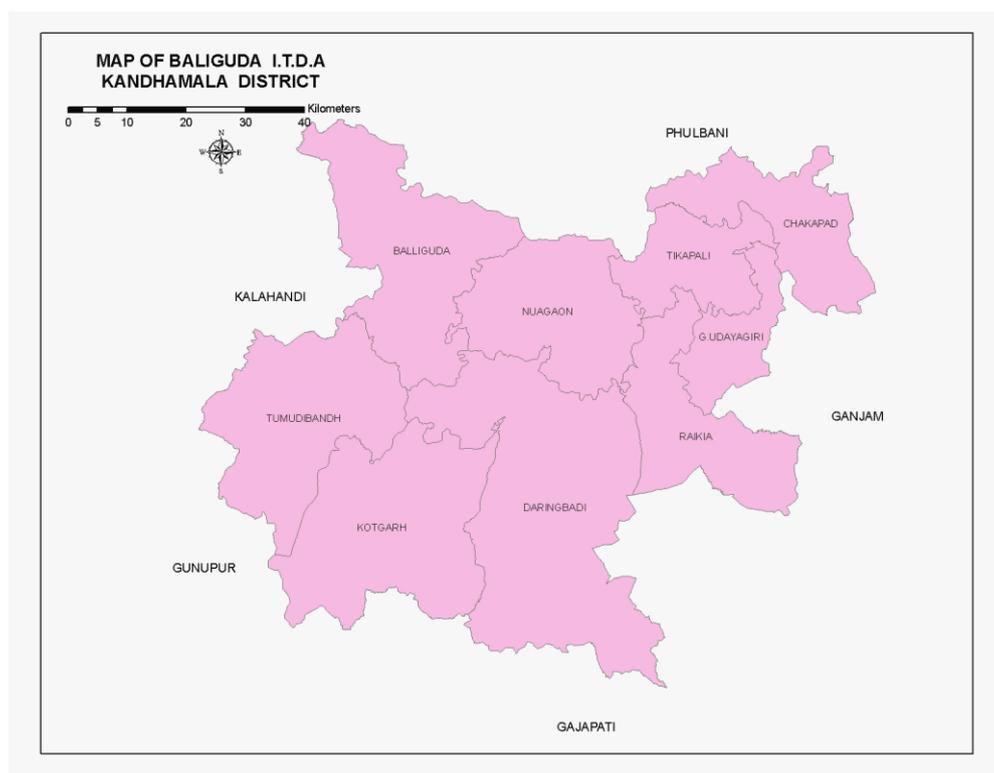
different parts of the country have made it possible to establish some demonstrative models. Among them, the 'WADI' (Orchard) approach adopted by an NGO – BAIF Development Research Foundation, Pune has left a visible impact in a short span of time and stands out as a sustainable model suitable for replication in other tribal areas of the country.

Profile of the ITDA

The Balliguda, ITDA covers the entire Balliguda sub-division consisting of 9 Blocks, such as Balliguda, Chakapad, Kotagarh, K.Nuagaon, Daringibadi, Raikia, G. Udayagiri, Tikabali and Tumudibandh.

Balliguda ITDA is situated in the Southern part of Orissa with 3061 sq kms of geographical area and consists of 1535 inhabited villages. It lies between $19^{\circ} 30'N$ and $84^{\circ} 39' N$ Latitude. The headquarters of the project area is situated at Balliguda, which is at a distance of 83 Kms. from district headquarters. The entire subdivision of Balliguda ITDA plateau lies at a height varying from 300 meters to 1,100 meters above the sea level. The entire area is a wild hilly tract intersected in all directions by streams and torrents, which run dry after the cessation of the rain.

Map of Balliguda I.T.D.A



The ITDA area has 1,26,489 hectare under forest constitutes dense forest of northern tropical semi-evergreen and moist-deciduous types rich in timbers like *Sal*, Teak and Bamboos of good quality. Important species found in the forest are *Sal*, *Piasal*, *Harida*, *Bahada*, *Mahua*, *Kendu*, Mango, *Magifera indica*, *Saral indica* (Ashoka). Minor forest produce like *Mahua* flower, *Sal* seeds, *Sal* leaves, *Kendu* leaves, Lac, *Jhuna*, *Harida*, Tamarind and medicinal plants like *Patala garuda* also found in the forest. *Harida*, *Bahada* and *Amla* are collected in large quantities from Daringibadi, Kotagarh and G. Udayagiri block.

The average annual rainfall is recorded as 1456 mm. The heavy rainfall in the early part of the rainy season and long spell of drought towards the end causes frequent failure of crops.

The principal crops grown in the district are paddy, ragi, maize, jowar minor millets like *Kudo* etc. and pulses like red gram, green gram and black gram. Among the commercial crops turmeric, potato, tobacco, fruits and vegetables are important. Turmeric is the main commercial crop and the district is noted for turmeric cultivation. Balliguda and G.Udayagiri block widely cultivate turmeric, which is the hereditary crop. Ginger, mustard, groundnut and castor are also important crops of the district.

Rice is the most important crop and is extensively grown in the district. The cultivators are also encouraged for diversification from low yielding autumn rice to drought resistant varieties of millets like ragi, jowar and maize in table land. The main vegetables cultivated in the area are sweet potato, onion, tomato, pumpkin, ridge gourd, bottle guard and bean etc. Generally vegetables are grown in land, lying close to the habitation and with easy irrigation facility. Climate of the district is congenial for cultivation of chili, coriander leaf, garlic, ginger and turmeric. The climate and topography of Balliguda, G. Udayagiri block area is suitable for fruit plantation like mango, jackfruits, banana, papaya, citrus, and pineapple.

Profile of the Project Blocks

G.Udayagiri and Tikabali, the two blocks out of 9 in Balliguda ITDA under Kandhamal district have been selected for implementation of *WADI*

project. The proportion of tribal inhabitants is more than 50% in both the blocks.

Table – 1.1
Block-wise area, village and households

Block	Total geographical area (in Sq. Kms)	No. of GPs	No of Villages		No. of households	Forest area (Hect.)	Net Area Sown (Hect)
			In habited	Un inhabited			
G. Udayagiri	137.97	8	78	05	7,264	1,812	2139
Tikabali	259.07	12	132	11	11,063	6,216	5576
<i>Total (Project area)</i>	<i>397.04</i>	<i>20</i>	<i>210</i>	<i>16</i>	<i>18,327</i>	<i>8,028</i>	<i>7,715</i>
Total ITDA	3061.00	109	1535	122	1,10,584	1,26,489	51,806
% of Project area to Total ITDA area	13	18	14	13	17	6	15

Source : District Statistical Hand Book – Kandhamal 2005.

It is observed from the above Table that :

- Balliguda ITDA comprises of 109 GPs and 1535 villages out of which 122 villages are uninhabited.
- The geographical area of the two blocks where the project is implemented comprises of 13% of the ITDA area and the percentage of forest area is 6% when compared to the whole ITDA area.
- The percentage of the households in the project area is 17% and the number of inhabited as well as habited villages comprises of 14% and 13% respectively of the total ITDA area.
- The net area sown in the project area comprises of 15% of the ITDA area.

Table - 1.2
Block-wise Distribution of Population by Ethno-Cultural Group

Block	Total Population			S.T. Population			S.C. Population		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
G. Udayagiri	30,631	14,963	15,668	19,952	9,722	10,230	3,711	1,840	1,871
Tikabali	46,688	23,040	23,648	25,535	12,428	13,107	9,815	4,847	4,968
ITDA TOTAL	4,50,277	2,22,970	2,27,307	2,45,150	1,21,604	1,24,699	66,724	33,090	33,634
<i>% to total population</i>	<i>100</i>	<i>49.52</i>	<i>50.48</i>	<i>54.44</i>	<i>27.00</i>	<i>27.69</i>	<i>14.82</i>	<i>7.35</i>	<i>7.47</i>

Source : Prospective Plan of Action for Sustainable Development of Balliguda ITDA during 11th Plan Period, prepared by SCSTRTI, Bhubaneswar.

In the ITDA area, the ST and SC population constitute 54.44% and 14.82% respectively. Concentration of ST population is 65% in G. Udayagiri Block and 55% in Tikabali block when compared to Total population.

Characteristic Features of Major Tribal Groups:

Generally two major tribes are found inhabiting in Balliguda ITDA area. The major dominant tribe of the area is the Kandha (2,29,550) followed by Gond (9,842). Block wise their number of household & population in the project area is given below.

Table – 1.3
Block wise number of Household & Population

Block	Kandha		Gond	
	Household	Popn.	Household	Popn.
G. Udayagiri	3582	17910	187	935
Tikabali	4998	24990	73	365
Total ITDA	45910	229550	1968	9842

Major Economic Activities

The main economic activities of the tribals are agriculture, collection and sale of minor forest produce, hunting and food gathering etc. Rice is their principal crop supplemented by ragi, maize, jowar, mustard etc. Turmeric is the main commercial crop in the project area. As the land is sloppy and uneven, horticulture plays an important role to supplement the subsistence agriculture. The agro-climatic conditions and soil type supports a wide range of horticultural crops. Both upland and medium land have been used for plantation of fruit trees like banana, mango and papaya in the district. Shifting cultivation widely practiced earlier by the tribal farmers and forest dwellers has been reduced considerably and under control in the area due to the active intervention of Government Sponsored Schemes and constant motivation to the tribals to go for settled cultivation.

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Chapter - 2

Objectives, Scope and Methodology

The *WADI*, literally stands for a composite farming system, is an effective approach for holistic development and generates livelihood through a combination of core interventions of horticulture, forestry and agricultural development along with soil water conservation and water resource development.

Objectives

The wider objective of the project is to stabilize the livelihood of participating tribal communities through reduction of poverty.

The objectives set for the study are as follows:

To assess the progress of :

- (viii) Implementation of eco-friendly income generating activities through establishment of orchard of the selected fruit crops.
- (ix) Intercropping and agro-forestry plantation for immediate project output, income generation and soil & water conservation.
- (x) Development of water sources to provide protective irrigation to fruit plants during the critical period.
- (xi) Formation of people's organizations.
- (xii) Scope of participation of women in development process.
- (xiii) Scope of employment generation in project areas.
- (xiv) Financial achievement of the project.

Scope

G.Udayagiri and Tikabali, the two blocks under Balliguda ITDA have been selected for implementation of *WADI* project. Under the project 1000 tribal families @ 500 from each block have been covered. The Project Implementing Agency was given freedom to select the villages and families in the blocks stipulating to the criteria as follows.

- Small and marginal farmers of ST communities owning not more than 5 acres of land.
- Annual income of the family should not be more than Rs.39500.
- The support from the project to the extent of development of maximum one acre per family.
- The participating families should be agreeable to work together with other families in groups and also provide family labour required for completion of core activity.

- They should be agreeable to adopt the project discipline.
- The tribal participants should commit themselves to make periodic, regular contributions to create a common village fund and to constitute a representative body at the village level for managing the programme and maintaining all the valuable assets created and generated by the project.

It was decided to execute the programme starting from selection of villages, beneficiaries to planting and capacity building through the NGOs and accordingly 3 NGOs namely, Phulbani Rural Development and Technology Agency (PRDATA), Social Welfare And Training Institute (SWATI) and SAMANWITA were approved by the Collector, Kandhamal as executing agencies. These three NGOs have been established during 1986-87, 1999-2000 and 1978 respectively. PRDATA and SWATI have taken up 375 beneficiaries each from G.Udayagiri and Tikabali block respectively where as SAMANWITA has taken up 250 beneficiaries @ 125 from each of G.Udayagiri and Tikabali block. The name of GPs and number of villages taken by the NGOs for execution of the project is as follows.

Table – 2.1

List of Selected GPs with Number of Villages and Beneficiaries included in the Project

Implementing NGO	Block	Name of the GP	No. of villages	No. of beneficiaries	
PRDATA	G.Udayagiri	Raikala	7	72	
		Mallikapodi	2	15	
		Katingia	12	108	
		Talarimaha	10	100	
		Lingagada	7	80	
		5	38	375	
SWATI	Tikabali	Paburia	5	46	
		Burbinaju	7	25	
		Guttingia	9	132	
		Padangi	4	65	
		Gardingia	7	52	
		Kainjhar	5	23	
		Katimaha	1	19	
		Bodimunda	2	13	
		8	40	375	
SAMANWITA	G.Udayagiri	Gressingia	10	57	
		Ratingia	6	34	
		Kalinga	7	34	
		3	23	125	
	Tikabali	Pikaradi	8	48	
		Gadaguda	10	46	
		Bodimunda	4	31	
		3	22	125	
			6	45	250
	Grand Total	2	19	123	1000

Methodology

The study was conducted during June-July, 2008 in Balliguda ITDA area covering both G.Udayagiri and Tikabali block where the project has been executed. Out of 8 GPs in G.Udayagiri block and 12 GPs in Tikabali block, the programme is executed in 19 GPs out of 20 excepting one GP in Tikabali block.

Multistage sampling has been used to select the GPs, villages and beneficiaries. At first stage, out of 19 GPs, 10 GPs were selected from G.Udayagiri and Tikabali block by using Sample Random Sampling without replacement. In the second stage, 20 villages out of 123 villages were selected covering 10 GPs taking into consideration the location of the villages, communication facilities, availability of WADI projects and number of beneficiaries. In the third (last) stage, 40 beneficiaries were selected out of 1000 beneficiaries. Besides, case studies were made in 6 villages covering 2 villages from each of the 3 NGOs. The list of GPs and villages studied along with number of households interviewed is given below.

Table – 2.2
Sample GPs and Villages

Block	GP	Village	No. of households	Implementing NGO
Tikabali	Paburia	1. Kutiguda	1	SWATI
		2. Sapaganda	4	
		3. Bariguda (Pipalsahi)	2	
		4. Dupepada	2	
	Guttingia	5. Daurapida (Badepanga)	3	
		6. Talausuga	2	
	Padangi	7. Padangi	4	
TOTAL	3	7	18	
G.Udayagiri	Gresingia	8. Kiramaha	3	SAMANWITA
	Ratingia	9. Padikia	3	
	Kalinga	10. Sujeli	1	
	Talarima	11. Singapali	1	PRDATA
		12. Dungi	2	
		13. Padhanpada	1	
		14. Talarima	2	
		15. Jabedi	1	
	Raikala	16. Raikala	2	
	Lingagada	17. Lingagada	2	
	Katingia	18. Lamungia	1	
		19. Alangkupa	1	
		20. Pdisubali	2	
TOTAL	7	13	22	
G.TOTAL	10	20	40	

Out of total 11 GPs and 62 villages in Tikabali block, 3 GPs and 7 villages were selected from the operational area of SWATI, the NGO. From G.Udayagiri block, 7 GPs and 13 villages were selected out of total 8 GPs and 61 villages where the project has been executed by SAMANWITA and PRDATA, the NGOs. The total number of beneficiaries interviewed is 40 although the fields of much more beneficiaries were visited and crop condition was observed in each field.

Techniques Used

Data Collection

Data have been collected from primary as well as secondary sources. The primary sources data were collected from the beneficiaries of *WADI* project through personal interview, group discussion and village schedule. Besides, case studies were also conducted at the village level. Secondary sources data were collected mainly from the ITDA. The following schedules were used for data collection.

- Household Schedule
- Village Schedule
- Project Schedule

Tabulation and Analysis

The data collected from the field through the Village Schedule and House Schedule were compiled using computer aided MS-Excel package. During analysis, average and mortality percentage of the crop were calculated using the following formulae.

$$\text{Average} = (X_1 + X_2 + X_3 \dots \dots \dots + X_n) / n$$

where n = No. of observations and X1 to Xn = Variables.

$$\text{Mortality Rate} = ((\text{Total plants} - \text{Plants survived}) / \text{Total Plants}) \times 100$$

* * *

Chapter - 3

Profile of the Project Area and the People

It is observed that all the sample villages are situated at foothill excepting one and the housing pattern is scattered type excepting linear pattern in only 3 villages. All the villages are situated close to the forest area. The Table below gives the detailed picture regarding location of the sample villages.

Table – 3.1
Situation of the sample villages

Block	GP		Village	Situation	Housing pattern	Distance from forest
Tikabali	Paburia	1	Kutiguda	Foot hill	Linear	Close to forest
		2	Sapaganda	Foot hill	Linear	Close to forest
		3	Bariguda	Foot hill	Scattered	Close to forest
		4	Dupepada	Foot hill	Linear	Close to forest
	Guttingia	5	Daurapida	Foot hill	Scattered	Close to forest
		6	Talausuga	Foot hill	Scattered	Close to forest
	Padangi	7	Padangi	Foot hill	Scattered	Close to forest
G.Udayagiri	Gresingia	8	Kiramaha	Foot hill	Scattered	Close to forest
	Ratingia	9	Padikia	Foot hill	Scattered	Close to forest
	Kalinga	10	Sujeli	Foot hill	Scattered	Close to forest
	Talarima	11	Singapali	Foot hill	Scattered	Close to forest
		12	Dungi	Foot hill	Scattered	Close to forest
		13	Padhanpada	Foot hill	Scattered	Close to forest
		14	Talarima	Foot hill	Scattered	Close to forest
		15	Jabedi	Foot hill	Scattered	Close to forest
	Raikala	16	Raikala	Foot hill	Scattered	Close to forest
	Lingagada	17	Lingagada	Foot hill	Scattered	Close to forest
	Katingia	18	Lamungia	Valley	Scattered	Close to forest
		19	Alangkupa	Foot hill	Scattered	Close to forest
		20	Pdisubali	Foot hill	Scattered	Close to forest

Table – 3.2**Basic Amenities available in the Villages**

Sl. No	Village	Electrification	Drinking water facility			CC Road/ Pucca Road	Cottage Industries
1	Kutiguda	No	Tube well	Well	Stream	Within village	Leaf plate making
2	Sapaganda	No	Tube well	--	Stream	-do-	-do-
3	Bariguda	No	Tube well	--	Stream	-do-	-do-
4	Dupepada	No	Tube well	Well	--	-do-	-do-
5	Daurapida	No	Tube well	--	Stream	-do-	-do-
6	Talausuga	No	Tube well	--	Stream	-do-	-do-
7	Padangi	No	Tube well	Well	--	-do-	-do-
8	Kiramaha	No	Tube well	Well	--	-do-	-do-
9	Padikia	No	Tube well	Well	Stream	-do-	-do-
10	Sujeli	Domestic	Tube well	Well	--	-do-	-do-
11	Singapali	No	Tube well	Well	Stream	-do-	-do-
12	Dungi	Domestic & Irrigation	Tube well	Well	Stream	-do-	-do-
13	Padhanpada	No	Tube well	Well	Stream	-do-	-do-
14	Talarima	No	Tube well	Well	Stream	-do-	-do-
15	Jabedi	No	Tube well	Well	--	-do-	-do-
16	Raikala	Domestic	Tube well	Well	--	-do-	-do-
17	Lingagada	No	Tube well	Well	--	-do-	-do-
18	Lamungia	No	Tube well	Well	Stream	-do-	-do-
19	Alangkupa	No	Tube well	--	Stream	-do-	-do-
20	Pdisubali	No	Tube well	Well	--	-do-	-do-

It is observed from the above Table that out of 20 villages, three have been electrified and the villagers use for domestic purpose. In Dungi village one bore well has been energized through electric power. All the villages have got drinking water facility through installation of tube wells. Besides, open

wells are found in 15 villages. In addition to tube well or open well people also depend on natural streams for drinking water purpose. Each village is provided with cement concrete road or pucca road. Since the villages are located close to the forest, cottage industry like leaf plate making is seen in all the villages.

Table – 3.3
Basic Amenities Available

Sl. No.	Village	Distance (in km) from						
		GP hqrs	Block hqrs	Post Office	ITDA hqrs	Bank	Weekly market	Bus stop
1	Kutiguda	1	15	1	60	1	1	1
2	Sapaganda	2	17	2	62	2	2	2
3	Bariguda	3	18	0	63	3	3	0
4	Dupepada	3.5	21	1	64	3.5	3.5	1
5	Daurapida	3	25	3	66	3	3	3
6	Talausuga	2	27	2	67	2	2	2
7	Padangi	0	20	0	68	2	2	2
8	Kiramaha	2.5	2.5	2	74	2.5	2.5	2.5
9	Padikia	0.5	3	0.5	75	3	3	3
10	Sujeli	3	8	3	78	8	3	3
11	Singapali	3	12	3	85	2	2	0
12	Dungi	2	11	2	75	3	3	0
13	Padhanpada	3	13	3	80	6	6	3
14	Talarima	0	10	0	80	7	7	0
15	Jabedi	1	9	1	78	8	8	1
16	Raikala	0	7	0	65	5	3	3
17	Lingagada	0	11	0	62	2	0	0
18	Lamungia	2	9	2	61	2	2	0.5
19	Alangkupa	2	10	1	64	4	4	4
20	Pdisubali	2.5	11	0	65	5	5	2.5

The above Table reveals that the villages are located either in the GP headquarters or very close to the GP headquarters. Only 30% villages are at a distance of 3.0 - 3.5 kms from GP headquarters. Only 30% villages are located within 10 kms of block headquarters and are easily accessible to the facilities provided by Government through blocks. All the villages are close to

the facility of post Office and 60% villages are located within 3 kms radius of the banks. Weekly market is not far from the village only excepting 3 villages, which are more than 5 kms from the weekly markets. All the villages are far from ITDA headquarters i.e. Balliguda, which is more than 60 kms, but the ITDA personnel and NGO network extend the facility from the ITDA to these villages promptly. The bus facility is available to the villagers within their reach.

Table - 3.4
Educational Status

Block	Total population of sample house holds	Literates							Not literate	Literacy percentage (%)
		Just Literate	Primary	HSC	Intermediate	Graduate	School going children	Total literate		
Tikabali	111	4	40	1	1	--	25	71	40	64
G.Udayagiri	107	9	15	2	3	1	23	53	54	50
Total	218	13 (6)	55 (25.2)	3 (1.4)	4 (1.8)	1 (0.5)	48 (22)	124 (56.9)	94 (43.1)	57

(Figures in the parenthesis indicate %)

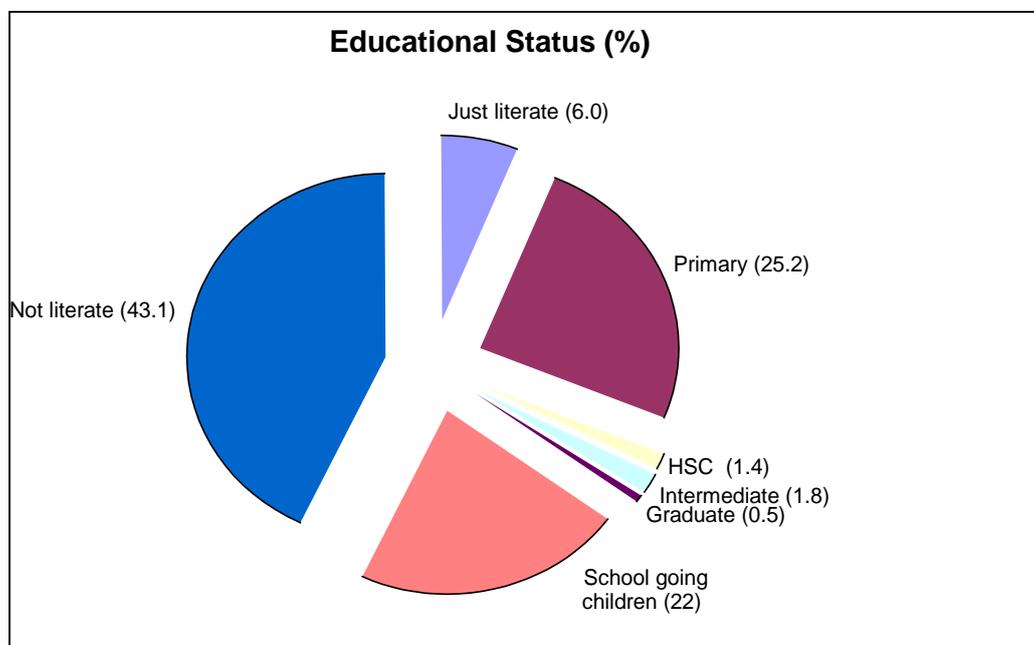


Table – 3.5
Female Literacy

Block	Total female population of sample households	Female Literates							Not literate (Female)	Female literacy percentage
		Just Literate	Primary	HSC	Intermediate	Graduate	School going children	Total literate		
Tikabali	56	--	13	--	--	--	16	29	27	52
G.Udayagiri	53	2	6	1	1	--	12	22	31	42
Total	109	2 (1.8)	19 (17.4)	1 (0.9)	1 (0.9)	--	28 (25.7)	51 (46.8)	58 (53.2)	47

(Figures in the parenthesis indicate %)

Literacy rate in the project area is 57% where as Tikabali block has the higher literacy rate of 64% and that of G.Udayagiri is 50%. Literacy up to primary level of education is 25% and at present 22% of the family members is school going children. Out of the female population 47% are literate and 26% is school going children. Out of the total population, the female literacy is 23% who has a major role in adopting the innovative technologies in the WADI field for maintenance and irrigation.

Table – 3.6
Population and Workforce per Household

Block	Population per household						Workforce per household			% of workforce to total adult population
	Adult			Children			Male	Female	Total	
	Male	Female	Total	Male	Female	Total				
Tikabali	2.17	1.94	4.11	0.89	1.17	2.06	1.94	1.56	3.50	85
G.Udayagiri	1.64	1.45	3.09	0.82	0.95	1.77	1.50	1.32	2.82	91
Average	1.88	1.67	3.55	0.85 (45%)	1.05 (63%)	1.90 (54%)	1.70 (90%)	1.42 (85%)	3.12 (88%)	88

The average adult population per household is 3.55 out of which male population is 1.88. The average workforce available from each household is 3.12, which accounts to 88% of the adult population. The male and female workforce accounts to 90% and 85% of the adult male and female population

respectively. The larger share of the adult population is available as family labour, which contributes directly to the farm management and farm production. The larger contribution of female labour has positive impact on maintenance of fruit crops including manuring, weeding, irrigation and providing tree guard.

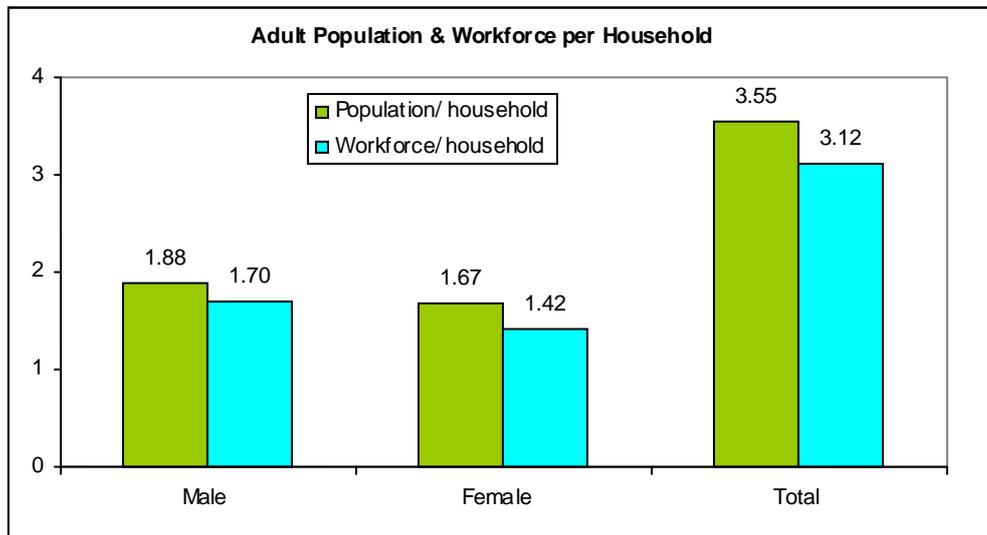


Table – 3.7
Occupation of the Sample Households

Block	No. of sample house hold	Primary		Secondary			
		Agri culture	Wage Earning	Agri - culture	Wage earning	Agril. labourer	Forest collection
Tikabali	18	14	4	4	13	--	1
G.Udayagiri	22	13	9	1	9	3	9
Average	40	27 (68%)	13 (32%)	5 (12.5%)	22 (55%)	3 (7.5%)	10 (25%)

It is revealed from the above Table that 68% of the household adopted agriculture as their primary livelihood and 32% of the household depend on wage earning as the primary source of income. As secondary source of income, 55% of the households have adopted wage earning followed by forest collection (25%), agriculture (12.5%). Only 7.5% of the households work as agricultural labourer to maintain their livelihood as secondary source of income. Since majority of the households depend on agriculture, their experience and contribution towards labour will add to the success of *WADI* project.

Table-3.8 below reveals that the average land holding per household is 3.39 acres out of which the share of their own land is 1.96 acres. It is observed that on an average each household has encroached 1.34 acres of land and put to agriculture use. Availability of bullock labour per household is 2.22 on an average where as the share of Tikabali block is higher than that of G.Udayagiri block.

Table – 3.8
Land Holding of the Sample Households and
Availability of Bullock Labour

Block	Average land holding per household (acre)				Availability of Bullock per house hold	
	Own land	Leased in land	Land encroached	Total cultivated land	Average bullocks per household	No. of household not having bullocks
Tikabali	2.05	0.17	1.36	3.58	2.78	1
G.Udayagiri	1.88	0.02	1.32	3.22	1.77	4
Average	1.96	0.09	1.34	3.39	2.22	2.5

The socio-economic status of the beneficiaries is given in the Table below.

Table – 3.9
Socio-Economic Status

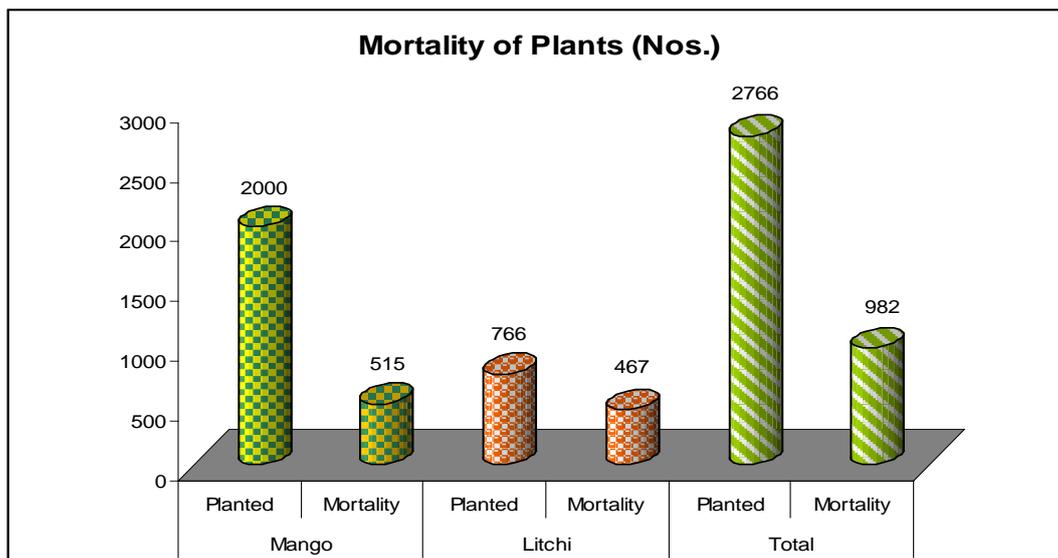
Block	No. of sample house holds	Type of House					Acquisition of modern movable assets	
		Thatched house	GC sheet roof	Asbestos roof	Indira Awas Yojana	Total	Bicycle	Radio
Tikabali	18	11	5	2	--	18	16	9
G.Udayagiri	22	11	2	5	4	22	10	4
Average	40	22 (55%)	7 (17.5%)	7 (17.5%)	4 (10%)	40 (100%)	26 (65%)	13 (33%)

The above Table reveals that 55% of the households maintain thatched house and 35% have converted to GC sheet or asbestos roof. *Indiara Awas Yojana* houses have been provided to only 10% of the households. As regard modern movable assets, 65% of the households use bicycle for their conveyance and 33% listen to radio. No use of TV, mobile phone, motor cycle were observed during field study.

* * *

Chapter- 4 Present Status of the Project

The Tables 15 below reveals that 2000 mango grafts including 1600 Amrapalli and 400 Dussery and 766 litchi gooties have been planted. The mortality has gone up to 982 including 515 mango plants and 467 litchi plants. The average mortality is 36% where as mortality of litchi is higher (61%) in comparison to mango (26%). It is observed that litchi is a delicate crop and needs much more care than that of mango. The beneficiaries need more training to take proper care of litchi as well as mango to reduce the rate of mortality. The ITDA and the NGOs have taken steps for gap filling during the Kharif, 2008 arose due to mortality. The diagram below represents the rate of mortality of both the crops.



The Table-16 below reveals that out of 40 sample beneficiaries, 17 have provided pitcher irrigation with the pitchers supplied by the ITDA through the NGOs. The rest beneficiaries have received the pitchers but not used in the field. All the 40 beneficiaries have provided tree guard and only 10 have provided fencing which accounts to 25% only. All the beneficiaries took proper care for digging of recommended size of pits and have applied organic manure for healthy growth of the plants. Out of 40 beneficiaries, 22 i.e, 55% have got the pass book. It is learnt from the NGOs that PRDATA has issued passbook to all the beneficiaries where as SAMANWITA has not yet issued the pass books due to want of photographs. SWATI has provided *WADI* passbooks to 39% of the sample farmers. However, both the NGOs were advised to immediately issue the passbooks and maintain the passbooks properly.

Table – 4.1
Status of Plantation of Fruit Crops

Executing NGO	Block	Programme (Mango+ Litchi) (Nos)	Actually planted (Nos)					Survived (Nos)			Mortality%		
			Mango (Amrapalli)	Mango (Dussery)	Total Mango	Litchi	Total plantation	Mango	Litchi	Total	Mango	Litchi	Total
SWATI	Tikabali	1260	720	180	900	340	1240	687	136	823	24	60	34
SAMANWITA	G.Udayagiri	490	280	70	350	140	490	295	88	383	16	37	22
PRDATA	G.Udayagiri	1050	600	150	750	286	1036	503	75	578	33	74	44
TOTAL		2800	1600	400	2000	766	2766	1485	299	1784	26	61	36

Table – 4.2
Facilities Provided to the Orchard

NGO	Block	No. of Sample Beneficiaries	Pitcher irrigation provided		Tree guard provided		Fencing provided		Organic manure applied		Pass book issued	
			Number	%	Number	%	Number	%	Number	%	Number	%
SWATI	Tikabali	18	7	39	18	100	1	6	18	100	7	39
SAMANWITA	G.Udayagiri	7	7	100	7	100	6	86	7	100	--	0
PRDATA	G.Udayagiri	15	3	20	15	100	3	20	15	100	15	100
TOTAL		40	17	43	40	100	10	25	40	100	22	55

Table – 4.3**Source of Irrigation to WADI**

NGO	Block	No. of Sample Beneficiaries	Source of Irrigation (No. of beneficiaries)				
			Tube well	Dug well	Stream/ Chuan	Nala	Total
SWATI	Tikabali	18	2	6	4	6	18
SAMANWITA	G.Udayagiri	7	3	--	2	2	7
PRDATA	G.Udayagiri	15	1	6	3	5	15
Total		40	6	12	9	13	40

Providing irrigation to the *WADI* field is a major constraint that leads to higher rate of mortality of the plants. In most of the cases it was observed that water is not available near the *WADI* fields. The beneficiaries provide water to the plants from various sources like tube well, dug well, stream or *chuan* and perennial *nala*. The *WADI* fields need provision of irrigation source by executing dug wells. During field visit a few dug wells were observed in Tikabali block which are being executed by SWATI, the NGO. However, execution of dug wells to cater the need of irrigation will be executed during the post monsoon period out of the funds available under Infrastructure Development.

Table – 4.4**Financial Progress**

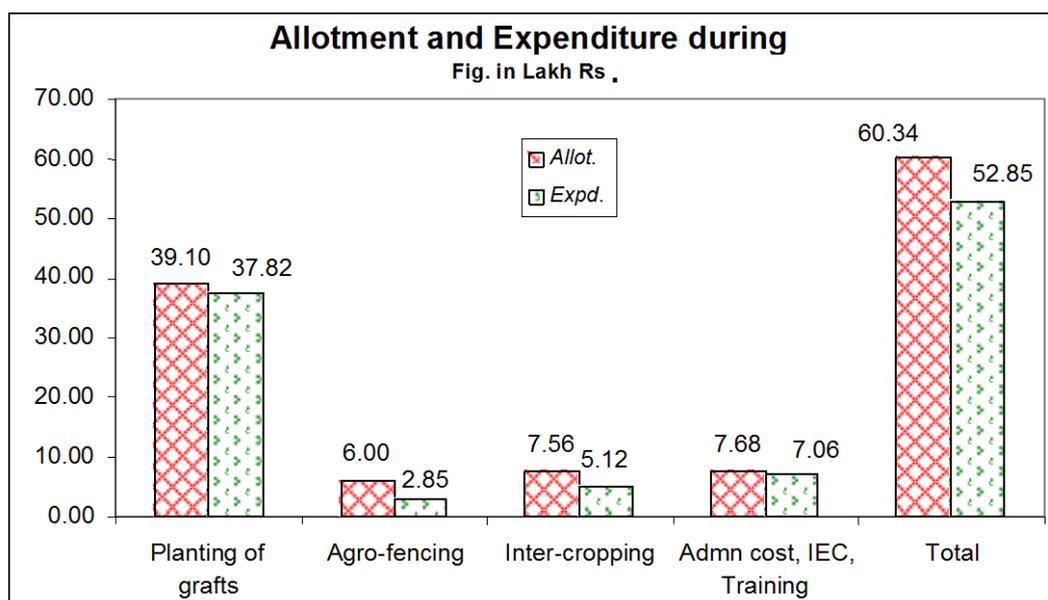
Year	Head	Allotment (Rs)	Expenditure (Rs)	Remarks
2007-08	Article 275 (1)	15,95,000	--	For infrastructure development
2007-08 (For 2008-09)	-do-	31,90,000	--	
2007-08	SCA to TASP	68,78,000	52,84,530	
2007-08 (For 2008-09)	-do-	30,32,000	1,28,800	Expenditure during April-May, 2008
Total		1,46,95,000	54,13,330	

Table – 4.5

Component wise expenditure during 2007-08 & 2008-09

Component	Allotment	Expenditure
2007-08		
Planting of mango & litchi grafts including cost of grafts and transportation etc for 1000 <i>WADIs</i> .	39,10,000	37,81,960
Agro-forestry (Bamboo & <i>Subabool</i>).	6,00,000	2,84,980
Inter-cropping with black gram for 880 <i>WADIs</i> (including seed cost, transportation, fertilizer, pesticides).	7,56,000	5,11,670
Administrative cost, IEC, Training.	7,68,000	7,05,920
Total	60,34,000	52,84,530
2008-09 (April-May, 2008)		
40% of administrative cost, IEC, Training given to the NGOs	30,32,000	1,28,800
Grand Total	1,46,95,000	54,13,330

The expenditure of Rs.52,84,530/- has been incurred during 2007-08 which accounts to 88% of the total allotment of Rs.60,34,000. The expenditure under infrastructure development will be incurred during winter for execution of water sources like dug wells for irrigation purpose.



The earmarked estimate for one acre *WADI* project for first year of the project period is Rs.7668/-, which includes Rs.6134/- of Government share and Rs.1534/- of Farmer's share. The break up of Rs.7668/- for each *WADI* has been decided by a Technical Committee on 30th July, 2007 comprising of Project Administrator, ITDA, Balliguda, Horticulturist, Addil District Agriculture Officer, Programme Coordinator, KVK, SMS (Hort), KVK, G.uadayagiri, Jr. Agriculture Officer, ITDA, Balliguda under the chairmanship of the Associate Director of Research, RRTTS, OUAT, G.Udayagiri. This has also been approved by the Collector, Kandhamal. The break up is follows.

Table – 4.6

Estimate of Expenditure for one acre *WADI*

Fig. in Rs.

Sl. No.	Item of work	Rate per unit	Govt. share	Farmer's share	Total
1.	Mango grafts (50 nos)	24.00	1200.00		1200.00
2.	Litchi <i>gooties</i> (20 nos)	20.00	400.00		400.00
3.	Pitting & planting	20.00	700.00	700.00	1400.00
4.	Tree guard	18.50	700.00	590.00	1290.00
5.	Plant Protection measures (Chloropyriphos 3.5 kg)	60.00	210.00		210.00
6.	Vermi compost/ Neem based organic manure -35 kg @ 0.5 kg/plant	10.00	350.00		350.00
7.	Pitcher irrigation	5.00	350.00		350.00
8.	Agro-forestry (Bamboo 200 nos & <i>Subabool</i> 200 nos) @Re.1/- per seedling, misc. cost including transportation (Rs.130/-), incentive to farmers for green fencing (Rs.70/-)	600.00 per <i>WADI</i>	600.00		600.00
9.	Inter cropping with Papaya (20 nos-Rs.60/-) +Drumstick (10 nos-Rs.40/-), cover cropping with black gram (Rs.400/-), chemical fertilizer (Rs.76/-), pesticides (Rs.60/-).	1000.00 per <i>WADI</i>	756.00	244.00	1000.00
10.	IEC, Training, Capacity Building & felicitation	768.00 per <i>WADI</i>	768.00		768.00
11.	Misc. Expenditure	100.00 per <i>WADI</i>	100.00		100.00
TOTAL			6134.00	1534.00	7668.00

Government share of Rs.Rs.6134/- for one acre *WADI* includes the cost of the inputs, transportation, incentive to farmers for green fencing, IEC, training, capacity building and miscellaneous expenditure. The farmer's share of Rs.1534/- for *WADI* of 1 acre is adjusted towards the labour rendered by

the beneficiary. The Technical Committee decided the break up of the provision of Rs.3222/- per acre for 2nd year of *WADI* project on 11th March, 2008 which is as follows.

		<i>Fig. in Rs.</i>
1.	Planting of mango (<i>Amrapalli</i>)	1400.00
2.	Planting of mango (other variety)	600.00
3.	Planting of litchi	900.00
4.	IEC, Training, Capacity Building & felicitation	322.00
	TOTAL	3222.00

Maintenance and repairing of fence, new fencing, labour for pit digging and gap filling will be borne by the beneficiaries during the second year.

Execution of the Programme

The first meeting was held at Secretariat, Bhubaneswar under the chairmanship of the Commissioner-cum-Secretary, ST & SC Development Department, Government of Orissa (GoO) on 12th July, 2007 where decision was taken to launch the programme immediately in G.Udayagiri and Tikabali block selecting 1000 beneficiaries @ 500 from each block. The Director of Horticulture, GoO, Managing Director, ST & SC Financial Development Corporation, Director, SCSTRTI, Project Administrator, ITDA, Balliguda, Executive Secretary of PRDATA and SWATI, the two NGOs participated in the discussion.

In the review meeting held on 21st July, 2007 under the chairmanship of the Collector, Kandhamal, the operational modalities were decided. A Technical Committee was formed taking the following members.

- Associate Director of Research, RRTTS, G.Udayagiri.
- Programme Coordinator, KVK, G.Udayagiri.
- Asst Soil Conservation Officer, G.Udayagiri.
- Tahasildar, G.Udayagiri.
- Horticulturist, G.Udayagiri.
- Addl. District Agriculture Officer, G.Udayagiri.

The NGOs developed awareness among the tribal communities for their enrolment as *WADI* beneficiaries through wide publication in newspapers, leaflets and posters. A copy of the leaflet is enclosed at Annexure-I. The NGOs invited applications from the willing farmers having uncultivated high land of minimum one acre belonging to tribal community and BPL category. The volunteers of the concerned NGOs motivated the farmers on personal contact and collected application in prescribed form addressing to the Project Administrator, ITDA, Balliguda. A copy of the application format is enclosed at Annexure-II.

The Project Administrator, ITDA, Balliguda took initiative to procure mango grafts and litchi *gooties* through the Director of Horticulture, Orissa from different nurseries. Accordingly distribution of mango grafts and litchi *gooties* started from 3rd August and 18th August, 2007 and completed on 7th September and 12th September, 2007 respectively. Plantation started from 15th August, 2007 by the NGOs in their area of operation. Planting of the grafts and *gooties* continued till late *Kharif*, which is one of the major reasons for higher mortality of the plants. Keeping in view the higher rate of mortality during transit from a long distance as well as after plantation, PA, ITDA, Balliguda, in consultation with the executing NGOs as per their field survey, has placed indent of 19,800 *Amrapalli*, 5200 *Dusseri* variety of mango grafts and 10,200 litchi *gooties* for gap filling during the second year.

The NGOs took initiative to conduct trainings and workshops and extended necessary guidance for field preparation, planting and after care of the plants. It is learnt from the beneficiaries in all the sample villages that the NGOs, through their volunteers, have taken care for imparting necessary trainings and guidance to the beneficiaries. Beneficiaries expressed their satisfaction regarding presence of the volunteers and their guidance during pit digging and plantation. PRDATA has conducted one workshop with the participation of all the 375 beneficiaries at SAMANWITA campus on 28th May, 2008. Besides, the NGO has conducted 24 trainings in different locations as expressed by the NGO in the review meeting. Similarly, SAMANWITA, another NGO has conducted one workshop on 14th May, 2008 inviting all the

250 beneficiaries of both the blocks (G.Udayagiri and Tikabali) in their campus with the experts from line departments and KVK. Besides, the NGO has conducted 6 GP wise trainings where 237 beneficiaries out of 250 actively participated. SWATI, the other NGO has conducted 14 trainings from December '07 onwards in different locations covering all the 375 beneficiaries. Like other NGOs, SWATI has conducted two workshops, one at Munigia village of Padhanpada GP on 16th December, 2007 and the other in SAMANWITA campus in G.Udayagiri on 29th March, 2008 covering all the 375 beneficiaries. Besides, SWATI has organized 7 more training sessions during May, 2008 on convergence of schemes like honeybee, poultry, goatery and Sustainable Rice Intensification (SRI).

Inter Cropping

In the review meeting held on 6th September, 2007 held at Samanwita, G.Udayagiri under the chairmanship of the Collector, Kandhamal, it was decided to take up inter cropping in the area already covered by plantation of mango and litchi. Accordingly, the NGOs took up steps for intercropping in 880 acres as per the following programme.

- PRDATA, G.Udayagiri - 330 acres
- SWATI, Tikabali - 350 acres
- SAMANWITA, G.Udayagiri - 200 acres

Black gram seeds of 52.80 Q of the following varieties was procured from Orissa State Seeds Corporation for intercropping on 18.09.2007 and supplied to the NGOs next day. The seeds were supplied to the beneficiaries @ 6 kg/acre.

- PU-30 - 12.96 Q
- PU-35 - 24.84 Q
- PU-19 - 15.00 Q

It is learnt from the beneficiaries during field visit that there was 100% crop loss in most of the cases due to unavailability of soil moisture because of late sowing i.e, during the last part of September. In a few cases, although the crop survived, but the yield was meagre as stated by the beneficiaries. A sum of Rs.5,11,670/- has been spent out of the allotted amount of Rs.7,56,000/- towards cost of seeds (Rs.3,03,970), fertilizers, rhizobium culture and plant protection chemicals (Rs.1,95,000) and transportation (Rs.12,700). ITDA is

taking steps to supply cowpea/ green gram/ black gram seeds during *Kharif* 2008 utilising the available resources to compensate the loss of black gram during first year.

It was also decided to grow papaya and drumstick as intercropping but it was not taken up during 2007 as the seedlings could not be arranged. Steps have been taken to grow papaya and drumstick as intercropping during *Kharif* 2008. Accordingly, PRDATA has placed indent for 7500 papaya and 3750 drumstick seedlings with the KVK, G.Udayagiri to be supplied during last week of July. SWATI has also raised 8500 papaya and 4000 drumstick seedlings which would be ready by mid-July. SAMANWITA has raised 6000 papaya and 3000 drumstick which would be ready for plantation by mid-July.

Agro-Forestry

A sum of Rs.6,00,000/- has been allotted for the year 2007-08 @Rs.600/- per *WADI* for agro-forestry. The Technical Committee, on 30th July, 2007, took the decision for plantation of *Subabool* and Bamboo stumps which are to be procured from different nurseries of J.K. Paper Mill, Rayagada. The Technical Committee was worried for delay in plantation of the same and suggested to complete the plantation by 20th August, 2007. But procurement of the stumps started on 1st of September and completed on 10th September, 2007 as the whole extension machinery was engaged for plantation of fruit crops. The following statement indicates the details of procurement by ITDA, Balliguda and distribution to the NGOs of bamboo and *subabool* stumps.

Table – 4.7
Procurement Status of Agro-Forestry Stumps

Figures indicate no. of stumps
B : Bamboo S : *Subabool*

Date of procure ment	ITDA, Balliguda		Location of nurseries	Date of distri- bution	SWATI		SAMANWITA		PRDATA	
	B	S			B	S	B	S	B	S
1.9.07	50,000		Tumudi bandha	1.9.07	50,000					
3.9.07	50,000		Narla Road, Bhawanipatna	3.9.07			50,000			
5.9.07	97,000	26,000	Rayagada	6.9.07	22,000	10,000			75,000	16,000
8.9.07		12,000	Patnagarh, Phulbani	8.9.07		12,000				
10.9.07		18,000	Nimapara, Begunia	10.9.07						18,000
Total	1,97,000	56,000			72,000	22,000	50,000	--	75,000	34,000

It is observed from the above Table that ITDA, Balliguda has started procurement of agro-forestry planting materials from different locations on 1st September, 2007 and completed within 10 days. The ITDA personnel have also distributed the stumps to the concerned NGOs either on the same day of receipt of the stock or the next day. The ITDA has procured 2,53,000 stumps @ Re.1/- per stump and incurred an expenditure of Rs.2,84,980/- including transportation. During the field visit no bamboo or *subabool* plants were noticed under agro-forestry component. It was ascertained from the beneficiaries that the stumps were supplied and planted but did not survive because of late plantation i.e. during last part of *Kharif* season. Also the mortality was high because of transportation from a long distance and also proper care could not be taken by the NGOs during stocking of the planting materials at their level due to lack of adequate technical knowledge. ITDA personnel has taken steps for plantation of agro-forestry species like bamboo, *subabool* and shimarouba utilising the balance amount of Rs.3,15,020/- under the agro-forestry component during the 2nd year.

Common Village Fund

It was observed that Common Village Fund has been constituted only in Sapaganda Village in Paburia GP of Tikabali block with participation of all the 8 beneficiaries and balance amount of Rs.500/- is available. All the 8 beneficiaries contribute Rs.25/- each month. Sri Bairagi Pradhan and Sri Manguli Pradhan are elected as President and Secretary respectively for the village fund. SWATI, the NGO is taking steps for formation of such funds in other areas. Besides, steps have been taken to constitute the Common Village Fund in Talarimaha village/GP in G.Udayagiri block by PRDATA, the NGO. The NGOs were suggested to constitute the funds immediately with the participation of the beneficiaries.

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Chapter - 5

CASE STUDIES

During field visit, case studies of 6 cases were taken up covering both the blocks and all the three NGOs, which are enumerated below.

Daurapida village of Gutingia GP (Tikabali Block) executed by SWATI

WADI field in Daurapida village (Badepanga hamlet) of Gutingia GP in Tikabali block has been developed in 5 acres land by Sri Gobardhan Pradhan, Sri Bisikesan Pradhan, Sri Ramesh Pradhan, Sri Elabari Pradhan and Sri Bachendra Pradhan with the technical guidance of the volunteers of SWATI, the NGO. Previously sesamum was grown in the area but it has been stopped since last 10 years because of low productivity. Monkey menace is another important factor for discouraging sesamum cultivation. The beneficiaries have applied farm yard manure and neem based organic fertilizer (7:10:5) @ ½ kg per pit and chloropyriphos dust to prevent termites. The volunteers of SWATI have guided them starting from pit digging to plantation, provision of tree guard and pitcher irrigation. SWATI has imparted necessary training and provided technology. Three beneficiaries out of five have gone for vermi composting and constructed vermi tanks. The beneficiaries have provided

tree guards and adopted pitcher method of irrigation. It was observed that almost all the mango plants have survived and



there is mortality to the extent of 30% in case of litchi plants. Gap filling of litchi and mango in a few places will be done during *Kharif* 2008. The NGO

has executed one open well of 30' depth and 7' diameter and stocked the concrete rings for installation. The beneficiaries have planned for plantation of papaya and drumstick as intercropping. Besides, they will take up cowpea as intercropping since black gram has failed last year due to late sowing i.e., during last part of September. The NGO has taken steps for supply of *shimarouba* as periphery agro-forestry plantation. The beneficiaries are growing local paddy during *Kharif* and getting yield of about 6-8 qtls per acre from other cultivated land, which meets the family consumption without any marketable surplus. They hope that this orchard will provide them a constant income after 5 years.

Sapaganda village of Paburia GP (Tikabali Block) executed by SWATI

Eight acres of *WADI* plantation has been taken up by 8 beneficiaries like Sri Bairagi Pradhan, Sri Gobardhan Pradhan, Sri Timpa Pradhan, Sri Manguli Pradhan and others in Sapaganda village of Paburia GP in Tikabali block with supervision and guidance of SWATI, the NGO. The land type is uncultivated highland with sandy loam soil texture. Previously the farmers were growing groundnut and turmeric with yield potential of about 3Q/acre for both the crops. Almost 40% mortality in litchi and 15% mortality in mango were observed. Among the beneficiaries, Sri Manguli Pradhan has taken much care to keep 17 litchi plants out of 20 and 45 mango plants out of 50 survive where as there was 75% mortality of litchi in the field of Sri Bairagi Pradhan. However, the beneficiaries have



planned for gap filling during the current *Kharif*. The beneficiaries use the water of Paburia Nalla for irrigation purpose. No bamboo or *subabool* was found in the field

under agro-forestry plantation. The farmers did not get any yield from black gram during last year due to late sowing as intercrop. The beneficiaries in consultation with the NGO have planned for plantation of banana, papaya, drumstick, groundnut and cowpea as intercropping and agro-forestry plantation during *Kharif* 2008 with the assistance of the ITDA and the NGO. The NGO has issued the *WADI* passbooks, which are also regularly maintained. Village fund has been constituted and balance amount of Rs.500/- is available. All the 8 beneficiaries contribute Rs.25/- each month. Sri Bairagi Pradhan and Sri Manguli Pradhan are elected as President and Secretary respectively for the village fund. The beneficiaries have attended trainings at the village level and at SAMANWITA campus in G.Udayagiri. Since last year the beneficiaries have adopted vermi composting. The visitors from SBI, Paburia, SWATI, ITDA, Balliguda, horticulture personnel have visited at different times and extended their cooperation. The beneficiaries are encouraged with the project and expect a constant income over years after 5 years.

Pradhanpada Village of Talarima GP (G.Udayagiri Block) executed by PRDATA

Shri Pyarison Pradhan of Pradhanpada Village in Talarimaha GP of G.Udayagiri block has developed his *WADI* field in one-acre area with the technical

assistance of PRDATA, the NGO. Out of 50 mango grafts and 20 litchi *gooties*, 45 and 14 have survived. He is providing



irrigation to his plot from nearby perennial *nalla*. He has installed pitchers for irrigation, provided individual tree guards as well as fencing around his

field. During *Kharif* 2008, he has grown beans and brinjal as intercrop and cowpea on the periphery. He has planned for radish and tomato during pre-rabbi. He has passed HSC and his wife has gone up to Class-X. He himself, his wife and his father contribute labour for the *WADI* field. He has developed a compost pit utilizing *mahula* flowers. He has also constructed a cottage for watch and ward of the field. His father is provided with one house under *Indira Awas Yojana*. He has already spent around Rs.1000/- for intercropping of brinjal and bean and expects a profitable return. Besides the *WADI* field, he has got 3 acres of land where he grows hyv and local paddy, maize, turmeric, *kandula* and til during *kharif* and mustard, black gram and vegetables during *rabi*. He has got the *WADI* pass book. He has attended training organized by PRDATA, the executing NGO at G.Udayagiri and regularly guided by the NGO volunteers. He has contacted the NGO for gap filling of 5 mango and 6 litchi during *kharif* 2008. He is an innovative cultivator with interest for adopting improved technologies and has proved his efficiency in farming. *WADI* programme is expected to be a success in his field because of his own interest and interest of his family members.

Pdisubali Village of Katingia GP (G.Udayagiri Block) executed by PRDATA

The villagers of Pdisubali village of Katingia GP in G.Udayagiri block have developed their *WADI* field in Sadangadu village under the



technical guidance of PRDATA. 11 beneficiaries, in a compact patch of 11 acres of barren land started the *WADI* project. The location of the *WADI* field is at a distance of about

4 kms from their village. The beneficiaries have provided tree guard for each pit. They provide water from a perennial nalla located at a little distance from the field. The average mortality of mango and litchi has gone as high as 70% and 100% respectively as observed during the field visit. Inadequate water during summer is the main reason for higher mortality. It is learnt that the NGO has provided the pitchers for irrigation but the beneficiaries have not installed the same. The distance of the *WADI* field is another important factor of higher mortality, as the beneficiaries could not take proper care of the plants. Besides, it was also pointed out by the beneficiaries that the local villagers also make harm to their plants. This is the reason for which the beneficiaries could not install the pitchers. No intercropping and agro-forestry plantation was noticed during the field visit. During the field visit, the beneficiaries like Sri Birupakhya Pradhan, Sri Madhab Pradhan and others present in the field assured to take proper care of the existing plants and for gap filling of mango and litchi. The beneficiaries requested to raise a shed with the investment of the ITDA for facilitating constant watch and ward. Because of lacking in watch and ward, the grazing cattle have also damaged the plants. It was felt to execute one or two large open wells keeping in view the discharge of water to provide irrigation to the entire 11 acres of the field.

Padikia Village of Ratingia GP (G.Udayagiri Block) executed by SAMANWITA

Smt Bikalini Pradhan, a woman beneficiary of Padikia Village of Ratingia GP in G.Udayagiri block has developed *WADI* in one-acre land near her newly built house far from the village near G.Udayagiri. She has provided



tree guard for each plant as well as fencing around the field. She has applied organic manure in the pit. She has undergone training twice conducted by SAMANWITA in their campus once in February and the other in May 2008. Smt Kanchan Pradhan, Supervisor of SAMANWITA has guided the beneficiary starting from digging of pit to plantation and post planting care also. The beneficiary is in close contact with the Supervisor. She has not been provided with *WADI* passbook due to want of photograph. SAMANWITA will supply the passbook shortly. Irrigation is provided from Madhujhari river which is about half kilometer from the field. She has installed pitchers for providing water to individual plants. She was suggested to clean the weeds from the pits for better growth of the plants. It was observed that she has maintained 45 mango and 10 litchi plants out of 50 and 20 respectively. The mortality of the plants is mainly due to constraint in providing water carrying from a distant place since no water was available in the canal of Madhujhari MIP during summer. The NGO will execute one dug well with the funds available under infrastructure development. She has planned for intercropping with papaya, drumstick, brinjal, early varieties of tomato & cauliflower during the current *Kharif*. No agro-forestry plant was noticed on the field bund. The beneficiary informed that there was 100% mortality of bamboo plants because of damage of most of the stumps during transit and also due to want of water during summer. Before implementation of *WADI*, she was growing local paddy in the said high land and getting only 2Q per acre. In her opinion the land is utilized in a productive way presently after implementation of *WADI*. In addition to this piece of land, she has one acre own land and ½ acre leased in land with canal irrigation facility where she grows high yielding paddy like *Lalata* and *Jajati* during *kharif* and planned for potato cultivation in ½ acre land during *rabi* provided she gets irrigation from the MIP.

Padikia Village of Ratingia GP (G.Udayagiri Block) executed by SAMANWITA

Sri Jagabandhu Pradhan of Padikia Village of Ratingia GP in G.Udayagiri Block has developed his *WADI* field in one acre of land in his village. He is

a graduate and her wife Smt Krushnapriya Pradhan has passed intermediate. Both of them work in the *WADI* field and taken care for survival of all the 20 litchi plants which is a rare case. However, out of 50 mango plants, 6 could not survive in spite of their utmost care. He was suggested to fill the gaps during rainy season. The Supervisor of SAMANWITA, Smt Kanchan Pradhan, has extended all cooperation and



guidance to this couple. The beneficiary provides water carrying from the dug well located inside the village. He has provided tree guard for

each pit and also covered the top of the tree guard with date palm leaves to protect the plants from scorching heat of Sun. This attempt made him succeed to protect all the litchi plants, which he took as a challenge. He has also provided green fencing on one side of the field close to the road to protect from the grazing cattle and would cover the periphery with green fencing during current rainy season. He has installed and properly utilized the pitchers. He would be provided with *WADI* passbook shortly by the NGO. Intercropping of black gram during last year was a failure because of late sowing. He has planned for intercropping with papaya and drumstick during the current year. Prior to implementation of *WADI*, he was growing only local paddy with productivity of about 3 Q per acre, which was not productive. In addition to *WADI* field, he has got another 3 acres of land, which is utilized for HYV and Local paddy in addition to turmeric, maize, black gram, beans and other vegetables in small patches.

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Chapter - 6

Conclusion

The successful WADI project will start production of mango from the 4th year but the production will reach the optimum level after 8 years. *Amrapali* variety of mango is an early crop in comparison to *Dussery*. Production of litchi will start from the 5th year where as optimum level of production can be achieved after 9 years. It is estimated that one acre successful WADI with 50 mango trees and 20 litchi trees will yield 1.5 MT of mango and 0.5 MT of litchi from the 10th year of plantation with recommended package of practices. So the beneficiaries will get a constant income from that acre of unproductive, barren, high land over years with application of fertilizers, micro-nutrients and plant protection chemicals. Besides, during the early phase of plant growth, income can be derived from intercropping of pulses and plantation crops like papaya and drumstick. The project also encourages the beneficiaries to form cooperative societies for profitable marketing of their produce. These societies may be encouraged to set up packing and processing units to get better return of their produce. It is presumed that the WADI beneficiaries will get continuous technical support from the Research Station and KVK of Orissa University of Agriculture and Technology as well as Horticulture wing of Government of Orissa located at G.Udayagiri on appropriate management practices including control of pests and diseases. The interest of tribal farmers and encouragement from Government level will change the socio-economic status of the area in a positive direction.

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Picture speaks louder than words



