

# Consolidated Report

2011-12 to 2017-18

NICRA – KVK, Kendrapara, Odisha

National Innovations in Climate Resilient Agriculture  
Technology Demonstration Component



**NICRA**   
National Initiative on Climate Resilient Agriculture



# Consolidated Report of TDC-NICRA (2011-12 to 2017-18)

## About the district and NICRA Village

### 1. Village information:

Name of the village and district	Village : Krushnadaspur, Block : Marshaghai, Dist- Kendrapara
No. of households	152
Total cultivated area (ha)	195
Area under rainfed cultivation (ha)	86
Major soil type	Alluvial (sandy loam)
Climatic vulnerability of the village and the extent area affected (explain) during the study period(2011-16)	Flood and Cyclone
Year of Implementation	2011-12 to 2012-13

Name of the village and district	Village :Kasotibali, Block : Pattamundei, Dist- Kendrapara
No. of households	150
Total cultivated area (ha)	128
Area under rainfed cultivation (ha)	56
Major soil type	Sandy loam
Climatic vulnerability of the village and the extent area affected (explain) during the study period(2011-16)	Flood and Cyclone
Year of Implementation	2013-14 to 2015-16

Name of the village and district	Village : Dasmankul, Block : Marshaghai, Dist-Kendrapara
No. of households	80
Total cultivated area (ha)	54
Area under rainfed cultivation (ha).	54
Major soil type	Sandy loam
Climatic vulnerability of the village and the extent area affected (explain) during the study period(2011-16)	Flood and Cyclone
Year of Implementation	2016-17

## 2. a) Rainfall received (mm):

Month	Normal rainfall (mm)	Actual 2011-'12	Deviation (%)	Actual 2012-'13	Deviation (%)	Actual 2013-'14	Deviation (%)	Actual 2014-'15	Deviation (%)	Actual 2015-'16	Deviation (%)	Actual 2016-'17	Deviation (%)	Actual 2017-18	Deviation (%)
January	10.6	0	-100.00	33.56	216.60	0	-100.00	0	-100.00	51.56	386.42	2.44	-76.98	0.67	-93.68
February	30.2	1.89	-93.74	0	-100.00	0	-100.00	24.11	-20.17	3.56	-88.21	17	-43.71	0	-100.00
March	35	20.89	-40.31	0	-100.00	3.33	-90.49	68.67	96.20	14.56	-58.40	6.44	-81.60	81.47	132.77
April	33.9	34.33	1.27	13.89	-59.03	77.89	129.76	0	-100.00	78.44	131.39	4	-88.20	2.67	-92.12
May	94.2	114.22	21.25	38.78	-58.83	100.56	6.75	189.89	101.58	26	-72.40	184.22	95.56	30.53	-67.59
June	208.3	421.39	102.30	90.22	-56.69	229.94	10.39	121	-41.91	121	-41.91	192.67	-7.50	142.83	-31.43
July	317.1	228.56	-27.92	309.28	-2.47	273.22	-13.84	396.33	24.99	431.33	36.02	216.49	-31.73	343.24	8.24
August	333.3	293.78	-11.86	224.89	-32.53	217.78	-34.66	328.44	-1.46	247.89	-25.63	510.47	53.16	330.92	-0.71
September	237.3	380.78	60.46	171.11	-27.89	163.89	-30.94	295.33	24.45	123.33	-48.03	276.09	16.35	148.02	-37.62
October	183.7	13.67	-92.56	65.56	-64.31	647	252.20	136.11	-25.91	87.67	-52.28	149.68	-18.52	228.89	24.60
November	67.2	0	-100.00	164.67	145.04	0	-100.00	0	-100.00	19.22	-71.40	83.18	23.78	146.16	117.50
December	5.2	0	-100.00	6.94	33.46	0	-100.00	1.44	-72.31	0.33	-93.65	0	-100.00	48.93	840.96
<b>Total</b>	<b>1556</b>	<b>1509.51</b>	<b>-2.99</b>	<b>1118.9</b>	<b>-28.09</b>	<b>1713.61</b>	<b>10.13</b>	<b>1561.32</b>	<b>0.34</b>	<b>1204.89</b>	<b>-22.56</b>	<b>1642.68</b>	<b>5.57</b>	<b>1504.33</b>	<b>-3.32</b>

## 2. b) Rainfall details of the district

Name of the KVK	Normal annual rainfall (mm)	Rainfall during 2018 (mm)	Excess/Deficit rainfall(mm)	% Deviation of rainfall from the normal i.e., (actual-normal)/normal * 100
KENDRAPARA	1556	1888.82	332.82	21.39

Historical Trends in Rainfall		Yearly Average						
		2011-'12	2012-'13	2013-'14	2014-'15	2015-'16	2016-'17	2017-18
No. of Rainy days		75	73	87	76	85	80	88
No. of dry spells during kharif season	> 10 days	1	1	0	1	1	1	1
	> 15 days	0	2	1	1	1	1	0
	> 20 days	0	0	0	0	0	0	0
No. of intensive rain spells	> 60 mm per day	1	3	1	2	2	2	1

Year	Normal rainfall (mm)	Total rainfall (mm) Jan-Dec	Rainy days (No.)	Dry spells > 10-15 days (No.)	Dry spells > 15 days (No.)	No. of highest rainfall intensity events (>60mm)	Water inundation floods > 10 days (No. of events)	Rainfall (mm)		
								Kharif	Rabi	Summer
2011-12	1556	1509.51	75	1	0	4	01	1324.51	13.67	171.33
2012-13	1556	1118.9	73	1	2	4	01	795.5	270.73	52.67
2013-14	1556	1713.61	87	0	1	2	-	884.83	647	181.78
2014-15	1556	1561.32	76	1	1	3	01	1141.1	137.55	282.67
2015-16	1556	1204.89	85	1	1	1	01	923.55	158.78	122.56
2016-17	1556	1642.68	80	1	1	4	-	1195.72	235.3	211.66
2017-18	1556	1504.33	88	1	0	1	01	965.01	424.65	114.67

3. The climatic vulnerability experienced during the study period (2011-18) including the frequency, duration of dry spells/ droughts/floods, high rainfall events causing flooding and other events, such as hail storm, cold wave, heat wave, etc. and the extent of area affected in the village, year wise.

Kendrapara is one of the coastal and most populous districts of the state. Kendrapara lies between 20° 21' 0" North to 22° 10' North latitude and 86° 29' E to 87° 83' E longitude. The district has a geographical area of 2,644 sq. km and the coastline covers 48 kms. It occupies only

1.7% of the total land mass of the state but accommodates 3.55 % of total population. The population density of the district (492) is very high; almost double of the State (236). The district is having 9 blocks like Aul, Derabis, Garadpur, Kendrapara, Mahakalapara, Marshaghai, Pattamundai, Rajkanika and Rajnagar, 1540 revenue villages, out of which 1407 are inhabited and 133 are uninhabited. These villages are under the jurisdiction of 230 Gram Panchayats. Out of 9 Blocks, population density is highest in Marshaghai block. Kendrapara district is prone to flood and cyclones. During *kharif*, most of the areas are flooded resulting in failure of crops. The present NICRA adopted village Dasmankul comes under Marshaghai block, which is 15 kms away from block head quarter and 35 kms from Krishi Vigyan Kendra. Dasmankul is remote village of Mangaraj Gram Panchayat under Marshaghai block of Kendrapara district. It is traversed by Major River like Paika .

The district faced 14 nos flood, one super cyclone in 1999, heat wave in 1998, cyclone like phaline, hud hud during the year 2013 and 2014 respectively in the last 25 years. All the NICRA villages Krushanadaspur, Kosotipali and Dasmankul are affected due to above calamities. The most climatic vulnerability of NICRA villages are untimely heavy rain, flood, dry spell and cyclone, which affected not only the field crops but also the fishery and livestock enterprise. Most of the time, due to untimely heavy rains the vegetable crops and the vegetable seedlings are affected, 100 % seedlings damaged also observed which leading to heavy loss to the farmers. During 2011 and 2013 flood 24 hectares of rice crop variety pooja and swarna damaged due to submerge condition about 15 to 20 days. Under NICRA programme the flood tolerant rice variety Swarna sub 1 has been demonstrated in the adopted village followed by formation of seed bank of that variety created awareness among the farmers to cultivate that variety. As a result the rice crop loss is reduced to only 3.0 hectares in 2017 flood. The nearby NICRA villages cultivated rice variety Swarna sub -1 and minimizing the vulnerability of rice crop damage in flood situation. Due to untimely heavy rain 1, 00,000 to 2, 00,000 seedlings are damaged almost in every alternative year and to overcome that problem the demonstration on raising of vegetable seedling under the low cost walk in tunnel poly house conducted and the farmers of NICRA villages along with the adjacent villages farmers are raising seedling under the poly house to save the seedling from heavy rain. The farming situations of NICRA villages are mostly rain fed medium land. The farmers are cultivated rice variety swarna during kharif. In Rabi season the farmers are unable to take up second crop due to scarcity of water in medium land and most of the land is fallow after Kharif rice. Around 28 ha. land is under rice fallow situation and the first crop in kharif rice variety Swarna. To overcome this problem the 145 days rice variety Swarna is replaced with 125 days DRR 44 followed by piara cropping of black gram variety PU 31 ( 80 days) resulted good yield of black gram by utilization of residual moisture. During the dry spell the farmers provide live saving irrigation to the rice crops from the water bodies created/renovated under the NICRA programme. About 52.0 hectares of rice crop saved by providing live saving irrigation in NICRA adopted villages in different years. To overcome the scarcity of water and increasing the water use efficiency the ridge and furrow method, broad based furrow method of vegetable cultivation (cow pea, radish, brinjal, cucumber) are adopted by the farmers. To successfully manage the poultry diseases in flood situation, a low cost portable poultry house is developed by an innovative farmer, which was now adopted by the NICRA adopted village farmers along with farmers of other villages. The poultry house main purpose is to provide safety to the poultry birds in the flood situation. As the house is a portable

one can transport to safety place during the natural calamities/adverse climatic condition like flood and heavy rain. During the year 2012 and 2015 the district received very low rain fall 1119 mm and 1205 mm rainfall against normal rainfall 1556 mm leads to scarcity of water in the critical rice crop growth stage. Almost 60 % less rain fall in June and October whereas 30 % less rain fall in the month of August & September in 2012. Similarly, Kendrapara district received 71 % less rainfall in November 2015 and 50 % less rainfall during September & October, 2015. This resulted dry spell leads to damage of crop. But, more than 52 hectares of rice crop saved by providing live saving irrigation from the water bodied created/renovated under the NICRA programme in the NICRA adopted villages. It is also observed that in the dry spell situation in July and August 21 hectares of rice crop affected in 2012 and 2015 due to the scarcity of water. At that time the community nursery play an important role by allowing the farmers retranslating of rice. In NICRA village during 2017 flood, resulted damage of 4.4 ha. vegetable crops and 3.0 ha of rice crop. Through the NICRA programme farmers are provided support for cultivation of potato (in river bank), short duration high yielding Green gram, Black gram and horse gram in post flood situation to strengthen their livelihood. The farmers got good yield and now they are got the idea on the cropping system they have to follow in the post flood situation.

#### 4. Predominant farm enterprises

i) **Cropping pattern:** Rice, green gram, horse gram, vegetables etc.

ii) **Major cropping system:** Rice –fallow, Rice-Green gram, Rice - vegetables

iii) **Area and productivity of major crops:**

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Year	Crop	Area (ha)	Yield (q/ha)
2011-12	Rice	130	36
	Green gram	14	5.4
	Black gram	8	4.6
	Horse gram	4	6.0
	Ground nut	5	16.4
	Sugar cane	2	84
	Jute	4.4	17
2012-'13	Rice	140	38
	Green gram	16	5.6
	Black gram	10	5.1
	Horse gram	4	6.8
	Ground nut	5.8	17.5
	Sugar cane	3	87
	Jute	5	18
2013-'14	Rice	236	40
	Green gram	36	5.5
	Black gram	18	5.4
	Horse gram	7	7.1
	Ground nut	6.2	18
	Sugar cane	18	91
	Jute	5.4	18.0
2014-'15	Rice	242	42.0
	Green gram	38	5.8
	Black gram	19	5.6
	Horse gram	7	7.2
	Ground nut	7.8	18.2
	Sugar cane	22	93
	Jute	5.4	18.5

2015-'16	Rice	242	42.0
	Green gram	39	5.8
	Black gram	19	5.5
	Horse gram	7	7.0
	Ground nut	8.0	18.5
	Sugar cane	26	95
	Jute	6.0	18.5
2016-'17	Rice	270	43.0
	Green gram	44	6.0
	Black gram	21	5.8
	Horse gram	7.8	7.2
	Ground nut	8.0	18.5
	Sugar cane	28	95.0
	Jute	6.0	19.0
2017-'18	Rice	272	44.0
	Green gram	45	6.2
	Black gram	21.8	5.9
	Horse gram	8.4	7.0
	Ground nut	8.0	18.5
	Sugar cane	30	95.0
	Jute	6.0	19.0
	Mustard	1.8	7.4

**iv) Predominant varieties of major food crops (upto 4 crops) in the village:**

**(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)**

<b>Year</b>	<b>Crop</b>	<b>Name of the variety/ hybrid (s)</b>	<b>No. of farmers using improved varieties / hybrids</b>	<b>Area under improved varieties / hybrids (ha) in the village</b>
2011-12	Rice	Swrna, Pooja, Sarala, Lalata, CR 1014, Sadhana	72	94
	Green gram	Local, PDM 139	25	8.4
	Black gram	Local, Prasad	11	4.2
	Ground nut	AK 12-24, Devi	18	5.0
2012-'13	Rice	Swarna sub -1, Swrna, Pooja, Sarala, Lalata, CR 1014, Sadhana	86	96.4
	Green gram	Local, SML 66, PDM 139	28	9.4
	Sugarcane	Raghunath		
	Ground nut	Smruti	21	5.8
2013-'14	Rice	Swarna sub -1, Swrna, Pooja, Sarala, Lalata, CR 1014, Sadhana	221	152
	Green gram	Local, SML 66, PDM 139	76	26
	Sugarcane	Raghunath	58	14
	Ground nut	Smruti	26	7

2014- '15	Rice	Swarna sub -1, Swrna, Pooja, Sarala, Lalata, CR 1014, Sadhana	248	158
	Green gram	Local, SML 66, PDM 139	88	28.4
	Sugarcane	Raghunath	64	15.8
	Ground nut	Smruti	27	7.8
2015- '16	Rice	Swarna sub -1, Swrna, Pooja, Sarala, Lalata, CR 1014, Sadhana	272	174
	Green gram	Local, SML 66, PDM 139	92	34
	Sugarcane	Raghunath	66	16.4
	Ground nut	Smruti	27	8.0
2016- '17	Rice	Swarna sub -1, Swrna, Pooja, Sarala, Sadhana	312	234
	Green gram	Local, IPM 2-14	106	38
	Black gram	T9,PU 31	82	18.4
	Horse gram	Urmi	14	2.8
2017- '18	Rice	Swarna sub -1, Swrna, Pooja, Sarala, Sadhana	323	242
	Green gram	Local, IPM 2-14	112	42.8
	Black gram	T9,PU 31	93	20.6
	Horse gram	Urmi	19	4.6

v) Cropping intensity (%): 180

vi) Horticulture: crops (fruits, vegetables, flower crops etc.), area and productivity of each crop

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Year	Crop	Area (ha)	Yield (q/ha)	Name of the variety/ hybrid (s)	Area under improved varieties / hybrids (ha) in the village
2011-12	Brinjal	2.4	157	Local, Utkal keshari, Utkal Jyoti	1.4
	Chilli	1.8	85	Utkal ava, Utkal rashmi	1.8
	Tomato	2.0	220	Utkal Kumari, Utkal Raja, Rajani, Rupali	2.0
	Potato	3.0	72	Local	0
	Cabbage	2.8	212	Priya, Ramada, Gold star	2.8
	Cauliflower	3.4	184	Kartika, Shewta, Amajing	3.4
	Pointed gourd	2.0	112	Local, Swarna reksha	0
2012-'13	Brinjal	4.6	162	Utkal tarini, JK 33, Madhuri, Pusa Kranti	4.6
	Chilli	2.0	87	Tejaswini, Kranti, Jawalamukshi, Surjyamukshi	2.0
	Tomato	4.8	223	Laxmi, Utkal Dipti, Swarna sampad	4.8
	Potato	7.0	78	Kufri chandramukshi, Kufri Sinduri, Kufri basdsaha, Kufri lalaima	7.0
	Cabbage	4.2	218	Pusa sambha, Pusa drum head, Field rocket	4.2

	Cauliflower	3.8	194	Snow ball -16,Rima, Late man,Mahima	3.8
	Pointed gourd	4.8	117	Swarna alukik	4.8
	Cowpea	0.4	58	Local	0.4
2013-'14	Brinjal	12.0	168	Utkal tarini, JK 33, Madhuri, Pusa Kranti	12.0
	Chilli	2.4	92	Tejaswini,Kranti,Jawalamukshi, Surjyamukshi	2.4
	Tomato	6.4	245	Laxmi, Utkal Dipti, Swarna sampad	6.4
	Potato	12	84	Kufri chandramukshi, Kufri Sinduri, Kufri basdsaha, Kufri lalaima	12
	Cabbage	6.4	222	Pusa sambha, Pusa drum head, Field rocket	6.4
	Cauliflower	5.0	198	Snow ball -16,Rima, Late man,Mahima	5.0
	Pointed gourd	7.0	124	Swarna alukik	7.0
	Cowpea	1.0	62	Pusa barshati, Utkal manika	1.0
2014-'15	Brinjal	14.0	172	Utkal tarini, JK 33, Madhuri, Pusa Kranti	14.0
	Chilli	3.0	93	Tejaswini,Kranti,Jawalamukshi, Surjyamukshi	3.0
	Tomato	7.4	252	Laxmi, Utkal Dipti, Swarna sampad	7.4
	Potato	14	86	Kufri chandramukshi, Kufri Sinduri, Kufri basdsaha, Kufri lalaima	14
	Cabbage	6.6	225	Pusa sambha, Pusa drum head, Field rocket	6.6
	Cauliflower	5.8	202	Snow ball -16,Rima, Late man,Mahima	5.8
	Pointed gourd	9.0	125	Swarna alukik	9.0
	Cowpea	1.4	68	Pusa barshati, Utkal manika, Kashi kanchan	1.4
2015-'16	Brinjal	14.0	172	Utkal tarini, JK 33, Madhuri, Pusa Kranti	14.0
	Chilli	3.0	93	Tejaswini,Kranti,Jawalamukshi, Surjyamukshi	3.0
	Tomato	7.4	252	Laxmi, Utkal Dipti, Swarna sampad	7.4
	Potato	17	86	Kufri chandramukshi, Kufri Sinduri, Kufri basdsaha, Kufri lalaima	17
	Cabbage	7.0	225	Pusa sambha, Pusa drum head, Field rocket	7.0
	Cauliflower	5.8	202	Snow ball -16,Rima, Late man,Mahima	5.8
	Pointed gourd	11.0	125	Swarna alukik	11.0
	Cowpea	1.4	68	Pusa barshati, Utkal manika	1.4
	Bitter gourd	2.0	91	Arka harit, Nakhara, Prachi, Priya, Kiran, chaman	2.0
	Pumpkin	3.4	265	Guamal, Badyabhati,Vairav, Arka chandan	3.4
	Cucumber	2.0	94	Himangi, Pusa Sangog, Azad, Trupti, Rani	2.0
	Cowpea	1.4	68	Pusa barshati, Utkal manika, Kashi kanchan	1.4
2016-'17	Brinjal	16.4	178	Utkal tarini, JK 33, Madhuri, Pusa Kranti	16.4
	Chilli	4.4	97	Tejaswini,Kranti,Jawalamukshi, Surjyamukshi	4.4
	Tomato	9.8	260	Laxmi, Utkal Dipti, Swarna sampad	9.8
	Potato	19.4	88	Kufri chandramukshi, Kufri Sinduri, Kufri basdsaha, Kufri lalaima	19.4
	Cabbage	9.0	229	Pusa sambha, Pusa drum head, Field rocket	9.0
	Cauliflower	7.6	206	Snow ball -16,Rima, Late man,Mahima	7.6
	Pointed gourd	12.0	125	Swarna alukik	12.0



	Cowpea	2.8	70	Pusa barshati, Utkal manika	2.8
	Bitter gourd	3.4	95	Prachi, Priya, Kiran, chaman	3.4
	Pumpkin	4.8	274	Guamal, Badyabhati, Vairav, Arka chandan	4.8
	Cucumber	3.0	99	Azad, Trupti, Rani	3.0
	Cowpea	1.4	68	Pusa barshati, Utkal manika, Kashi kanchan	1.4
2017-'18	Brinjal	17.0	186	Utkal tarini, JK 33, Madhuri, Pusa Kranti	17.0
	Chilli	5.2	102	Tejaswini, Kranti, Jawalamukshi, Surjyamukshi	5.2
	Tomato	10.4	262	Laxmi, Utkal Dipti, Swarna sampad	10.4
	Potato	21.4	90	Kufri chandramukshi, Kufri Sinduri, Kufri basdsaha, Kufri lalaima	21.4
	Cabbage	9.4	230	Pusa sambha, Pusa drum head, Field rocket	9.4
	Cauliflower	7.8	206	Snow ball -16, Rima, Late man, Mahima	7.8
	Pointed gourd	13.8	125	Swarna alukik	13.8
	Cowpea	3.4	71	Pusa barshati, Utkal manika	3.4
	Bitter gourd	4.2	95	Prachi, Priya, Kiran, chaman	4.2
	Pumpkin	5.8	274	Guamal, Badyabhati, Vairav, Arka chandan	5.8
	Cucumber	4.8	101	Azad, Trupti, Rani	4.8
	Cowpea	1.4	68	Pusa barshati, Utkal manika, Kashi kanchan	1.4

vii) Area under fodder cultivation and number of farmers growing green fodder:

Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Year	Source of irrigation	Area (ha) under irrigation
2011-12	Lift irrigation	86
2012-'13	Lift irrigation	86
2013-'14	Lift irrigation/Canal/Water bodies	142
2014-'15	Lift irrigation/Canal/Water bodies	142
2015-'16	Lift irrigation/Canal/Water bodies	142
2016-'17	Lift irrigation/Canal/Water bodies	-
2017-'18	Lift irrigation/Canal/Water bodies	-

viii) Micro-irrigation:

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Year	Micro-irrigation	Area (ha)	No. of farmers
2011-12	-	-	-
2012-'13	-	-	-
2013-'14	Drip irrigation	0.8	4

2014-'15	Drip irrigation	1.4	8
2015-'16	Drip irrigation	1.8	11
2016-'17	-	-	-
2017-'18	-	-	-

**ix) Livestock:**

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Year	Livestock type	Total number	No. of livestock owner	Share of improved breeds (%)	Major livestock diseases	Extent of vaccination (%)	Mortality rate (%) due to diseases
2011-12	Local/indigenous	218	82	-	FMD cattle	12	14
2012-'13	Local/indigenous	232	83	-	PPR in goat	56	8
2013-'14	Local/indigenous/Hybrid	442	148	22	Ranikhet in poultry	62	6
2014-'15	Local/indigenous/Hybrid	468	152	27	HS, BQ	66	5
2015-'16	Local/indigenous/Hybrid	492	163	34		70	5
2016-'17	Local/indigenous/Hybrid	572	255	37		72	3
2017-'18	Local/indigenous/Hybrid	594	272	42		75	2

**xi) Milk productivity (litres/milch animal/day):** 8 lit/day (average production)

**xii) Details data about inland fisheries practiced:**

IMC, 35 qt./ha

**5. a) Resource availability:** Status of common pool resources (CPRs)

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Year	CPR	Area (ha) or Numbers	Current status
2011-12	Pasture, Village forest, River bank, Water bodies	9	9
2012-'13	Pasture, Village forest, River bank, Water bodies	9	9
2013-'14	Pasture, Village forest, River bank, Water bodies	21	24
2014-'15	Pasture, Village forest, River bank, Water bodies	21	24
2015-'16	Pasture, Village forest, River bank, Water bodies	21	24
2016-'17	Pasture, Village forest, River bank, Water bodies	32	35
2017-'18	Pasture, Village forest, River bank, Water bodies	32	35

#### 5. b.1. Summary of Water harvesting interventions taken up in the NICRA village

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

	Structures/Y ears of Construction	Category	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	2016 -17	2017-18
1	No. of farm ponds/ <i>Jalkund</i>	Constructed							
		Repaired/ Renovated	1	1	1	-	-	-	-
2	Community pond /tank	Constructed				1			
		Repaired/ Renovated	-	1	1	-	-	-	-
3	Percolation tanks/ Recharge pits (No.)	Constructed							
		Repaired/ Renovated							
4	Recharging of open/tube wells with silt trap	Constructed							
		Repaired/ Renovated							
5	No. of Check dams	Constructed			1	1			
		Repaired/ Renovated							

6	Permanent check dam/Sand Bag Check dam (No.)	Constructed			1	1			
7	Drainage Channel (length in meter)	Cleaning/desilting							
8	Arhars/pynes etc	Renovated							
9	Recharging of wells								
10	Others								

### 5.c) Status of farm mechanization before start of NICRA:

- i) MB plough
- ii) Diseal motor
- iii) Manual operated thresher

List of Farm implements available in the village:

- i. MB plough
- ii. Diseal motor
- ii. Power operator thresher
- iii. Axial flow thresher
- iv. Rotavator
- v. Powertiller
- vi. Mould blow plough
- vii. Paddy winnower

### 6. Socio-economic status: (Three villages Krushanadaspur, Kosotipali, Dasmankul)

#### a) No. of households

Category	No. of household						
	2011-'12	2012-'13	2013-'14	2014-'15	2015-'16	2016-'17	2017-'18
General	14	14	29	29	29	35	35
OBC	88	88	206	206	206	272	272
SC	36	36	51	51	51	55	55
ST	12	12	16	16	16	20	20
Total	150	150	302	302	302	382	382

#### b) Literacy rate (%): 58

Male: 64 Female:52

#### c) Average family income from agricultural and allied activities (only the village Kosotipali, where NICRA programme implemented from 2013-14 to 2015-16)

Category	No. of families		Annual income (Rs. / family)
	2011-'12		
Marginal (1-2.5 ha)	72		72000
Small (<1.0 ha)	59		84000
Large (>5.0 ha)	19		144000

2012-'13		
Marginal (1-2.5 ha)	72	96000
Small (<1.0 ha)	59	108000
Large (>5.0 ha)	19	156000
2013-'14		
Marginal (1-2.5 ha)	72	102000
Small (<1.0 ha)	59	114000
Large (>5.0 ha)	19	168000
2014-'15		
Marginal (1-2.5 ha)	72	114000
Small (<1.0 ha)	59	120000
Large (>5.0 ha)	19	174000
2015-'16		
Marginal (1-2.5 ha)	72	120000
Small (<1.0 ha)	59	126000
Large (>5.0 ha)	19	180000
2016-'17		
Marginal (1-2.5 ha)	72	126000
Small (<1.0 ha)	59	132000
Large (>5.0 ha)	19	186000
2017-'18		
Marginal (1-2.5 ha)	72	144000
Small (<1.0 ha)	59	156000
Large (>5.0 ha)	19	192000

d) Workers engaged in agricultural activity (%): 68

e) Insurance coverage (numbers):

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Category	No. of families
2011-12	
Crop	-
Livestock	-
Weather	-
2012-'13	
Crop	24
Livestock	8
Weather	-
2013-'14	
Crop	42
Livestock	14
Weather	-
2014-'15	
Crop	64
Livestock	24
Weather	-
2015-'16	
Crop	92
Livestock	34
Weather	-
2016-'17	
Crop	108
Livestock	41
Weather	-
2017-'18	
Crop	112
Livestock	44
Weather	-

## Module wise Interventions

### 2.1. Natural Resource Management

#### 2.1.1 In-situ Moisture Conservation - Resource Conservation Technology:

Table. Performances of demonstration of in-situ moisture conservation technologies

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)	Economics of demonstration (Rs/ha)		
				Gross Cost	Net Return	BCR
Green Manuring	62	72	48.4	67760	27960	1.70
Ridge & furrow method of cow pea cultivation	14	1.6	68	36,500/-	47,500/-	2.30
Broad based furrow method of cucumber cultivation	27	6.4	82.0	36,500/-	45,500/-	2.24
Vermi	34	34	1MT/63ft <sup>2</sup>	--	--	--
Ridge & Furrow Brinjal	46	48	234	55003 288200	44997 138200	1.81 1.92
Plantation of cashew nut and casuarinas in river bed for soil erosionact as wind breaker & live hood support. (2013-14)	25	1		10666/-		
<b>Total</b>	<b>208</b>	<b>88</b>				

#### 2.1.1.1 Impact of each intervention (around 100 words):

The demonstrations/interventions taken under NICRA programme in the NICRA adopted villages are shown the path to the farmers to adopt different technologies resilient to the climate change more particularly heavy rain, flood and cyclone in Kendrapara district. **The farmers are lost their vegetable seeding due to untimely heavy rain, now they are used low cost walk in tunnel poly house for vegetable seedling raising , more than 32 farmers of NICRA village locality are raised their vegetable seedling under poly house.** The farmers are adopting ridge and furrow, broad based furrow method of vegetable cultivation (Cow pea, Cucumber, Radish, Brinajl etc.) by reducing the no of irrigation upto 30 %. About 42 farmers of NICRA and its adjacent village are adopted the ridge and furrow as well as broad based furrow method of vegetable cultivation in rabi season. The green manuring is a very good practice of in-situ moisture conservation as well as soil health management. We have demonstrated the green manuring in three NICRA adopted villages. Now more than 42 hectares of land under green manuring in NICRA adopted villages and nearby villages. Poly mulching with drip irrigation in brinjal resulted good yield with increase the water use efficiency of the crop.

#### 2.1.2 Water harvesting and recycling for supplemental irrigation:

**Table. Performances of water harvesting and recycling for supplemental irrigation**

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)/Unit	Output (q/ha)	Economics of demonstration (Rs/ha)		
				Gross Cost	Net Return	BCR
Renovation of old water harvesting structure in paddy field	12	2.4	48q./ha	67200	25200	1.6
Raising of land embankment	-	-	-	-	-	-
Ground water recharge	-	-	-	-	-	-
Construction of new pond for wheat	-	-	-	-	-	-
Desiltation of defunct water harvesting structures	16	5.00	45.8	64120	22320	1.53
Renovation of pyne	-	-	-	-	-	-
Renovation of irrigation channel	-	-	-	-	-	-
Newly Check dam	12	3.4	45.0	63000	24000	1.61
Renovation of common pond	6	1.4	46.2	64680	23180	1.55
10 bamboo boring	-	-	-	-	-	-
<b>Total</b>	56	122				

**2.1.2.1 Impact of each intervention (around 100 words):**

The construction of new check dam, renovation/desiltation of water harvesting structure and farm pond provide live saving irrigation to the rice crop at critical crop growth stage. Generally in rain-fed condition the rice crop affected due to dry spell above 10-15 days, at that time the water bodies created through the NICRA programme play an important role to save the crop. Now the farmers are himself constructed 4 nos of water bodies from the government support, in which they also taken up pisciculture as well as used to provide live saving irrigation to the crops. The water bodies created / renovated under NICRA programme is now provide live saving irrigation to 18 ha. of rice crop.

**2.1.3 Conservation tillage:****Table. Performance of ZTD in various crops**

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstration (Rs./ha)		
				Gross Cost	Net Return	BCR
Sowing of Maize with ZTD	-	-	-	-	-	-
<b>Total</b>	-	-				

**2.1.3.1 Impact of each intervention (around 100 words):**

NA

## 2.1.4 Artificial ground water recharge:

**Table. Performance of artificial ground water recharge technologies demonstrated**

(Three villages Krushanadaspur from 2011-12 to 2012-13, Kosotipali from 2013-14 to 2015-16 and ,Dasmankul from 2016-17 to 2018-19)

Technology demonstrated ( During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstration (Rs./ha)		
				Gross Cost	Net Return	BCR
Ground water recharge through SRI by sub-soiler	32	8.4	78	109200	54800	2.0
<b>Total</b>	<b>32</b>	<b>8.4</b>				

### 2.1.4.1 Impact of each intervention (around 100 words):

The SRI method of rice cultivation is mostly suitable for medium land with well drainage and irrigation facilities. The high yielding medium duration rice varieties (120-140 days) is suitable for SRI method of rice cultivation in medium land. The farmers are developed roller markers/manual rope liner for transplanting the rice seedling in appropriate distance in the main field. Due to the higher yield, more than 62 % yield increase over the conventional practice with BC ratio around 2.0. Now the farmers of NICRA adopted villages and its adjacent villages cultivating the rice in SRI method with better yield in more than 23 ha. area.

## 2.1.5 Water saving irrigation methods:

**Table. Performance of different water saving irrigation methods**

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstration (Rs./ha)		
				Gross Cost	Net Return	BCR
Irrigation system (micro lift Irrigation system) for paddy	28	54.0	46.8	65520	22720	1.53
Mulching in brinjal (Polymulching)	12	2.5	320	88,000/-	1,04,000/-	2.18
<b>Total</b>	<b>20</b>	<b>56.5</b>				

### 2.1.5.1 Impact of each intervention (around 100 words):

Now lift irrigation is very essential to take the second crop in Rabi season and also provide live saving irrigation to the crop during the long dry spell. In NICRA and NICRA nearby villages the framers are now adopting this process an also they have formed pani panchyat for smooth management of water among the farmers at the time of need. Now in NICRA villages pani panchyat formed and more than 60 farmers 88 ha. area are under irrigation.



## 2.1.6 Other Demonstrations:

**Table. Performance of other demonstrations**

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstration (Rs./ha)		
				Gross Cost	Net Return	BCR
Demonstration of heat tolerant tomato variety Chranjivi	20	22.0	310	272	13.97	88,000/-
Green gram cultivation in residual moisture IPM 2-14	73	43.4	6.9	5.7	21%	16,000/-
Cultivation of bitter gourd in Grow bag	24	4.5	78	Damaged	100%	34,000/-
Demonstration on Improved Groundnut var. smruti	25	8.4	24.10	19.20		60250
Demonstration on HYV cow pea Kashi Kanchan	22	4.2	140	90		30,000
Tomato under straw mulching	9	1.4	328	280	17.14	72000

### 2.1.6.1 Impact of each intervention (around 100 words):

Green gram cultivation in residual moisture demonstration conducted successfully in the NICRA villages particularly in the catchment area of water bodies renovated/created under NICRA programme. Similarly cultivation of bitter gourd in poly grow bag also adopted by more than 42 farmers in NICRA and nearby NICRA villages. Straw mulching in tomato, and high yielding varieties of ground nut and cow pea also cultivating by the farmers.

### Rainwater harvesting structures developed:

**Table: KVK wise rainwater harvesting structures developed during 2016-17**

RWH structures (During 2011-12 to 2017-18)	No.	Storage capacity	No. of farmers	Protective irrigation potential (ha)	Increase in cropping intensity (%)
Desiltation of defunct water harvesting structures	1	14400 cum	16	4.0	170
Newly Check dam for water harvesting	2	16575	12	4.8	175
Renovation of Pond	1	850 cum	6	2.0	170
Bora bandh (Temporary check dam)	2	1020	12	3.0	168
Defunct pond	1	750 cum	6	1.2	166
Jalkund	1	550 cum	5	0.8	160
Small ditches for jute retting	5	380 cum	4	0.6	180
Renovated defunct water bodies	2	1880 cum	28	5.8	185

### 2.1.7.1 Impact of each intervention (around 100 words):

The construction and renovation of water bodies provide live saving irrigation to the crops and increase the cropping intensity as well as yield of crop. The jute retting ditches developed under the NICRA programme, now adopted by more than 18 farmer of nearby villages of NICRA adopted villages. Borabandhan under NICRA programme is a new concept to farmers for repair of embankment of water harvesting structure, pond and check dams during heavy rain. This technology is low cost technology and does not require more skill and prepared in very short period of time. This method is now adopted by most of the farmers to repair their water bodies embankment and increase the water holding capacity of water bodies. Some farmers are also increase their water bodies pondage area by utilized the borabandhan technology and doing pisciculture activities in the seasonal ponds. Now more than 24 farmers of NICRA and nearby village farmers are adopting this process at the time of need.

## 2.2 MODULE II: CROP PRODUCTION

### 2.2.1 Introducing drought resistant varieties:

Table. Performance of different drought tolerant varieties

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield(q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Demonstration of yam cultivation to overcome the drought situation	10	4.6	184	146	26	214000/-	1,54,000/-	1.71
Demonstration of EFY cultivation to overcome the drought situation	10	2.8	410	368	11.41	402,000/-	213,000/-	1.53
Demonstration of drought tolerant rice variety sahabgaidhan	20	5.0	26	34	30	30400	17,200	1.56
<b>Total</b>	<b>40</b>	<b>12.4</b>						

### 2.2.1.1 Impact of each intervention (around 100 words):

The rice variety sahabgaidhan is a short duration drought tolerant variety and stands even in long dry spell 15-20 days successfully, now more than 32 farmers are growing sahabgaidhan successfully in 38 ha. of land. Similarly in drought condition Yam and EFY is grow with high profit. Under NICRA programme we have demonstrated Yam (Orissa elite, Shreenidhi) and EFY ( Gajendra ) as crop diversification and also high returns even in drought condition. Now farmers are taking interest and more than 32 farmers are cultivating these tuber crops in 4 ha. area.

### 2.2.2 Introducing salt tolerant paddy varieties:

**Table. Performance of different salt tolerant paddy varieties**

Technology demonstrated (Salt tolerant varieties) (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Lunishree	8	2.4	43.0	32.0	34	60200	19700	1.48
<i>Lunibarhiral</i>	12	3.2	42.4	34.0	24.70	59360	20860	1.54
<b>Total</b>	<b>20</b>	<b>5.6</b>						

### 2.2.2.1 Impact of each intervention (around 100 words):

Out of nine block of Kendrapara district seven blocks are under saline condition. The cultivation of ruling variety rice is not possible and the saline tolerant rice varieties are preferred by the framers. The varieties like Lunishree and Lunibahirial are resulted resistance to saline condition with average yield 43 qt. and net income Rs.20,000/- per ha. Now most the farmers are cultivating these two varieties rice in saline condition.

### Introducing flood tolerant varieties:

**Table. Performance of different flood tolerant varieties**

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
			Cultivation of flood tolerant rice variety (Var. Swarna Sub-1)	112		68	44.5	-
Post flood potato cultivation Kufri sinduri	62	25.4	182	152	70%	76,000/-	1,06,000/-	2.39
Post flood mustard cultivation variety - Anuradha	42	22.2	9.2	7.5	22.60%	22,000/-	24,000/-	2.1
Post flood Green gram cultivation in residual moisture IPM 2-14	73	43.4	6.9	5.7	21%	16,000/-	18,500/-	2.15
Post flood horse gram cultivation Urmi	58	34.6	9.6	7.8	23%	12,000/-	16,800/-	2.4
<b>Total</b>	<b>347</b>	<b>193.6</b>						

### 2.2.3.1 Impact of each intervention (around 100 words):

The climate vulnerability of NICRA village is flood and cyclone. It was observed that in every alternative year there is flood and the flood water retain in the crop field upto 10-12 days , sometimes more than that which is sufficient to damage the ruling variety rice crop Pooja, Swarna, Sarala etc. In this situation under NICRA programme we have demonstrated Swarna –sub-1 rice variety which is tolerant to submerge condition upto 15 to 17 days with yield potential 50-55 qt./ha. In the year 2016-17, the farmers transplanted Swarna sub-1 and it is survive in the submerge condition upto 13 days with good yield. After that we are also demonstrated the Swarna Sub -1 variety in NICRA village Dsamankul in 2017-18. Now the Swarna sub 1 variety is cultivated in more than 155 hectares of land of NICRA and other villages. Now Government also started the demonstration of Swarna sub 1 variety. The farmers are generally not taken any crop after flood, under the NICRA programme demonstrations on post flood potato, mustard, Green gram and horse gram cultivation were taken up in the flood year successfully with BC ratio 2.39, 2.1, 2.15 and 2.4 respectively. 44 farmers of NICRA and nearby villages are cultivating pulses, oil seed and potato in post flood situation in 15 ha. area.

### 2.2.3 Advancement of planting dates of *rabi* crops in areas with terminal heat:

Table. Performance of advancement of planting dates in different crops

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-

### 2.2.4.1 Impact of each intervention (around 100 words): NA

### 2.2.5 Water saving paddy cultivation methods:

Table. Performances of water saving technologies for paddy cultivation

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR

Water saving technology through SRI	32	8.4	78	48	62	54400	54800	2.0
<b>Total</b>	<b>32</b>	<b>8.4</b>	<b>78</b>	<b>48</b>	<b>62</b>	<b>54400</b>	<b>54800</b>	<b>2.0</b>

### 2.2.5.1 Impact of each intervention (around 100 words):

The SRI method of rice cultivation is mostly suitable for medium land with well drainage and irrigation facilities. The high yielding medium duration rice varieties (120-140 days) is suitable for SRI method of rice cultivation in medium land. The farmers are developed roller markers/manual rope liner for transplanting the rice seedling in appropriate distance in the main field. Due to the higher yield, more than 62 % yield increase over the conventional practice with BC ratio around 2.0. Now the farmers of NICRA adopted village and its adjacent village cultivating the rice in SRI method with better yield.

### 2.2.6 Community nurseries for delayed monsoon:

**Table. Performance of Community nurseries**

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Raised Community nursery of rice (var. <i>Swarna sub -1</i> )	58	2.0	-	-	-	-	-	-
Raised vegetable nursery (Tomato)	28	0.2	260	294	13	235200	155200	2.94
<b>Total</b>	<b>86</b>	<b>2.2</b>						

#### 2.2.6.1 Impact of each intervention (around 100 words):

Community nursery of rice and vegetables may be considered as suitable contingent majors for the delayed monsoon or adverse climatic condition like dry spell/drought/flood. If the crop damaged particularly the rice crop due to long dry spell then after the rain we could again transplant the seedlings available in the community nursery. Similarly, the vegetable seedlings are also produced under the low cost poly house in community nursery. The farmers are generally raised their vegetable nursery in open field condition leading to damage in untimely rainfall upto 100 %. In this situation only alternative source of seedling is community nursery. The NICRA village and other nearby village framers are formed committees and adopted community nursery technology as a contingent major to adverse climatic condition. Now the farmers are raising rice and vegetable seedling in community nursery as contingent majors during adverse climatic condition.

## 2.2.7 Location specific intercropping systems with high sustainable yield index:

Table. Performance of different location specific intercropping systems

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Total	-	-	-	-	-	-	-	-

### 2.2.7.1 Impact of each intervention (around 100 words):

NA

## 2.2.8 Introduction of new crops/ crop diversification:

Table. Performance of different crop diversification in NICRA villages

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Cultivation of Yam	12	1.6	184	146	26	21400	154000	1.71
Cultivation EFY	14	0.8	410	368	11.41	402000	213000	1.53
Cultivation of Cowpea	08	1.6	84	72.5	15.86	36500	47500	2.30
Total								

### 2.2.8.1 Impact of each intervention (around 100 words):

The framers are habituated to growing rice crops with marginal profit in medium land in irrigated condition and as well as in rainfed condition. It is observed that the crop failure due to scarcity of water and long dry spells. In this situation the crops like Yam and Elephant foot yam are survive and give good yield. If not harvested in the same year then the crop will harvest in the next year with higher yield. The farmers are interested to cultivate yam and EFY instead of other crop. More than 32 farmers are cultivating these tuber crops in 4.0 ha. area.

## 2.2.9 Other Demonstrations:

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Area (ha)	Output (q/ha)	Economics of demonstration (Rs./ha)		
				Gross Cost	Net Return	BCR

Demonstration of heat tolerant tomato variety Chranjivi	20	22.0	310	272	13.97	88,000/-
Green gram cultivation in residual moisture IPM 2-14	73	43.4	6.9	5.7	21%	16,000/-
Cultivation of bitter gourd in Grow bag	24	4.5	78	Damaged	100%	34,000/-
Demonstration on Improved Groundnut var. smruti	25	8.4	24.10	19.20		60250
Demonstration on HYV cow pea Kashi Kanchan	22	4.2	140	90		30,000
Tomato under straw mulching	9	1.4	328	280	17.14	72000

### 2.2.9.1 Impact of each intervention (around 100 words):

Green gram cultivation in residual moisture demonstration conducted successfully in the NICRA villages particularly in the catchment area of water bodies renovated/created under NICRA programme. Similarly cultivation of bitter gourd in poly grow bag also adopted by more than 42 farmers in NICRA and nearby NICRA villages. Straw mulching in tomato, and high yielding varieties of ground nut and cow pea also cultivating by the farmers.

## 2.3 MODULE III-Livestock & Fisheries

### 2.3.1 Use of community lands for fodder production during droughts / floods:

Table. Performance of different fodder demonstration in community lands

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmer	Unit/ Area (ha)	Output (q/ha)		% increase	Economics of demonstration (Rs/ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Napier-co4	12	0.4	1200	-	-	185,000/-	4,15,000/-	3.24
<b>Total</b>	12	0.4						

#### 2.3.1.1 Impact of each intervention (around 100 words): NA

#### 2.3.2 Improved fodder/feed storage methods:

In community land, farmers who are rearing improved cows are in commercial basis formed a group and cultivating the hybrid grass for their own cattle consumptions and also sometimes sale to the needy framers. The farmers are dividing their responsibility and purchase the grass from the group.

Table. Performance of improved fodder

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Unit/ Area (ha)	Yield (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Hybrid napier CO 4	18	1.0	1200qt/ha	-	-	185000	415000	3.24
Total	18	1.0	1200qt/ha	-	-	185000	415000	3.24

### 2.3.2.1 Impact of each intervention (around 100 words):

Cultivation of Napier CO 4 round the year and feeding to the milch cow is increase the yield upto 10-15 % and also very useful during the lean season and adverse climatic condition like flood. Now 22 farmers of NICRA and nearby NICRA villages are cultivating this grass in 4 ha. area.

### 2.3.3 Preventive vaccination:

Table. Performance of various vaccination camps organized

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Unit/ No./ Area (ha)	Measurable indicators of output* (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Vaccination camp against FMD Cattle & PPR against goat	172	-	Disease incidence 6 %	Disease incidence 22 %	72 % decrease	-	-	-
Vaccination for PPR in goat and Ranikhet in Poultry.	48	-	Disease incidence 7 %	Disease incidence 18 %	61 % decrease	-	-	-
Proper De-worming	172	-	Disease incidence 8 %	Disease incidence 21 %	62 % decrease	-	-	-
<b>Total</b>	<b>404</b>	<b>-</b>						

### 2.3.3.1 Impact of each intervention (around 100 words):

Under the NICRA programme Animal health camps are conducted for the big and small ruminants regularly which resulted decrease in disease infestation as well as mortality. The farmers are now aware about the benefit of animal health camp and doing regularly by contacting line department and minimize their losses due to lack of vaccination and deworming.

### 2.3.4 Management of ponds / tanks for fish and duck rearing:

Table. Performance of composite and cat fish in the renovated ponds



Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Unit/ No. / Area (ha)	Measurable indicators of output* (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Composite Fish Farming	14	1.4	32.4	24.2	33.8	232000	156800	1.67
<b>Total</b>								

#### 2.3.4.1 Impact of each intervention (around 100 words):

The farmers are motivated to take pisciculture activities in their unutilized seasonal ponds with onsite training on improved pisciculture technologies. Some ponds also renovated under NICRA programme and now the farmers are taking IMC in these ponds.

#### 2.3.5 Livestock demonstration:

Table. Performance of livestock demonstration in NICRA adopted villages

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Unit/ No. / Area (ha)	Measurable indicators of output* (q/ha)		% increase	Economics of demonstration (Rs./ha)		
			Demo	Local		Gross Cost	Net Return	BCR
Breed up gradation in local goat with beetal buck	8	8 nos.	29 kg	21 kg	38 %	2400/-	4850/-	3.02
Mineral Mixture	140	212	700 lit	576 lit	16 %	11,400/-	6,100/-	1.53
Rural backyard poultry Kadaknath Birds	20	200 nos.	800 gm(in 8 months)	400 gm(in 8 months)	50%	1150	2450	2.25
Low cost Azolla production as supplementary cattle feed	20	20 units	6.3 lit	6 lit	51.2	20	81	5.05
Replacement of local breed with Khaki Cambell	28	280	2.2kg, Egg:275	1.2kg, Egg:160	45.45	100	41.81	2.2
<b>Total</b>								

#### 2.3.5.1 Impact of each intervention (around 100 words):

Under the NICRA programme , the demonstration on improved poultry breed like Banaraja, Polyshree, kadaknath and khaki Campbell were demonstrated from 2012-13 to 2017-18 successfully. Similarly for breed up gradation of local goat beetal buck were demonstrated and now farmers are getting 38 % body weight increase than the local breed. More than 60 farmers are rearing banaraja, polyshree,kadaknath and khakicampbell poultry birds and more than 25 farmers have beetal breed goat (160 goats) in NICRA and nearby NICRA villages.

### 2.3.6 Improved shelters for reducing heat stress in livestock:

Table. Performance of improved shelters for poultry and dairy animals

Technology demonstrated (During 2011-12 to 2017-18)	No. of farmers	Unit/ No. / Area (ha)	Measurable indicators of output* (q/ha)		% increase	Economics of demonstration (Rs./ha)			
			Demo	Local		Gross Cost	Gross Return	Net Return	BCR
Improved shelters for Goat	11	11 nos.	Disease Incidence 4 %	18 %	77 % decrease	-	-	-	-
Improved shelters for poultry	18	18 nos	Disease Incidence 12%	21 %	43 % decrease	-	-	-	-
Total	29	29 nos							

#### 2.3.6.1 Impact of each intervention (around 100 words):

Shelter is very important for the small ruminants and poultry birds to minimize the infectious diseases and mortality particularly in the adverse climatic conditions. So, under NICRA programme demonstrations were taken up on low cost goat housing system and low cost poultry housing system. Now, more than 23 farmers are rearing their poultry birds and goats in the improved housing system in NICRA and nearby villages of NICRA.

### 2.4 Module IV: Institutional Interventions

Table. Details of the various institutional interventions

Interventions (During 2011-12 to 2017-18)	Details of activity			No. of farmers	Unit/ No. /Area (ha)
	Name of crops / Commodity groups / Implements	Quantity(q) / Number / Rent / Charges	Technology used in seed / fodder bank & function of groups		
Seed bank	Rice Swarna Sub-1	26	The farmers returned just double the quantity of seed, he has taken from the bank after harvesting. The seeds will be procured for the bank by	24	10.4

			selling that seed.		
	Rice- Drought tolerant/ Short Duration Var. Sahabghidhan	8	The farmers returned just double the quantity of seed, he has taken from the bank after harvesting. The seeds will be procured for the bank by selling that seed.	18	5.8
Fodder bank	Hybrid Napier(CO-4)	28 t/yr	Managed by the group	12	0.4ha

#### 2.4.1 Impact of each intervention (around 100 words):

The grain bank and fodder bank play an important role by providing the seed and grass at the time of need. The farmers are taking seeds mostly in the Kharif season and fodder during the lean season. Now rice variety Swarna sub -1 and sahabghidhan kept by the farmers in the grain bank.

#### 2.4.1 Village Climate Risk Management Committee (VCRMC)

Name of the VCRMC: Maa Ratnadevi Village Climate Risk Management Committee

#### 2.4.2 Custom Hiring of Farm Implements and Machinery at NICRA Adopted villages.

Table. Revenue generated through Custom hiring Centres and VCRMC in KVKs

Name of KVK	2012-13 to 2017-18	Revenue generated (Rs.) Total under VCRMC
Ganjam I		
Jharsuguda		
Kalahandi		
Kendrapara		24.800
Sonepur		
<b>Total</b>		

#### 2.4.2.1 Impact of each intervention (around 100 words):

### 3. Capacity Building organized during 2011-12 to 2017-18

Thematic area	Topic of the training	No. of Courses	No. of beneficiaries		
			Male	Female	Total
Crop production	Cultivation of flood/drought/salt tolerant rice varieties	01	14	11	25
	Improved package of practice of tuber crop				
	cultivation				

	Crop diversification from rice to non-rice				
	Vermicompost production techniques				
	Flood and drought tolerant rice varieties				
	Advancement of sowing date to reduce the climate vulnerability of crop				
Income Generation Activity	Bee Keeping				
	Mushroom cultivation				
	Value added product of tomato				
	Backyard poultry and duckery				
	Multiple stocking and multiple harvesting in seasonal pond				
	Value added product of milk				
In-situ Moisture conservation	Ridge and furrow, broad based furrow method of vegetable cultivation	01	23	2	25
	Importance of green manuring in rice				
Women in Agriculture	Planning, Lay out & maintenance of nutrition garden	01	-	25	25
	Formation and management of SHG groups				
Natural Resource Management	Vermicompost production				
	Management of problematic soil				
	Importance of drip irrigation				
	Collection of soil samplings and soil pest based fertilizer application				
Nutrient Management	Organic farming	01	19	6	25
	Soil test based fertilizer application				
	Importance and use of biofertilizer for soil health management.				
	Integraed nutrient management in pulses and oil seed crop				

	Production of quality compost using local resources				
Resource conservation Technology	Zero Tillage				
	Operation & Maintenance of Zero Tillage Machine				
	Summer ploughing				
	Direct seeding method of rice				
Integrated Pest and disease management	Use of traps for vegetable cultivation	01	22	3	25
	Storage pest of pulses and their management				
	Judicious pesticide application in crops				
	Integrated Disease Management				
	Use of grain super bag for storage of pulses				
Nursery raising	Process of development of community of nursery and its importance as crop contingent major				
Repair & Maintenance of farm machinery & Implements	Operation and maintenance of sprayer and small agril. implements and tools				
Integrated Farming System	Integrated Farming System				
Livestock and Fishery Management	Feed and health management of livestock				
	Feeding breeding and management of Goat in adverse climatic condition				
	Prevention and control of live-stock Disease				
	Scientific rearing of IMC				
	Composite fish culture				
Fodder and feed management	Skill/knowledge development on Fodder and feed management				

#### 4. Extension Activities conducted during 2011-12 to 2017-18

Name of the activity	Number of Programmes	No. of beneficiaries		
		Male	Female	Total

Agro advisory Services	120	520	210	730
Soil Health Camp	08	138	62	200
Focus Group Discussion	32	320	180	500
Diagnostic visit	94	362	212	574
Exposure visits	06	118	62	180
Field Day	16	520	280	800
Group meeting (SHG)	22	0	448	448
Method demonstrations	91	742	224	966
Animal Health Camp	9	450	0	450
<b>Total</b>	<b>398</b>	<b>3170</b>	<b>1678</b>	<b>4848</b>

**5. Soil Health Cards distribution during 2011-12 to 2017-18**  
**One note on Celebration on World soil day (200 words)**

Krishi Vigyan Kendra, Kendrapara celebrated the World Soil Day today at its campus on 5<sup>th</sup>, December attended by Sri. Dasarathi Sathpathy, IAS Collector cum District Magistrate, Kendrapara, Sj. Kishore Chandra Tarai, MLA, Kendrapara, Sj. Manas Kumar Parida, President Zilla Parishad, Kendrapara, Sj. Anambandhu Dhal, Chairman Kendrapara, Govt. Officials, Scientists from KVK and JRS, Kendrapara, farmers and farm women of the district. Observing the occasion, a number of different types of awareness programmes, exhibitions, various other events were organized to make the people aware about the importance of soil in our lives. A Farmers cum Scientists Interaction Session on “Efficient management of soil health and environment” was also held which discussed various challenges faced by the farmers pertaining to soil. Demonstration on Soil testing was accomplished by KVK and Soil Testing van of Agriculture department, Kendrapara at KVK campus where 12 Numbers of soil sample was tested and health cards issued. During the occasion, 165 numbers soil health cards was distributed by Hon'ble MLA, Kendrapara Sj Kishore Chandra Tarai and Sri. Dasarathi Sathpathy, IAS Collector cum District Magistrate, Kendrapara.

**Table- SHC card distribution at NICRA adopted villages during**

KVK	No of soil samples collected	No. of samples analysed	SHC issued	No of Farmers involved
Ganjam I				

Jharsuguda				
Kalahandi				
Kendrapara	184	184	184	148
Sonepur				
<b>Total</b>				

## 6. Convergence Programme:

**Table- Convergence of ongoing development programmes / schemes in NICRA implementing KVKs**

Development Scheme /Programme	Nature of work	Amount (Rs.)
Demonstration on green manuring by District Agriculture Department	Supplied dhanicha at subsidy rate for promotion of green manuring	320,000
Village concrete road	Road constructed by PWD department from village entrance to end of the village	2,40,000
Cloth for work	Repair of village	1,20,000
Tube well for drinking water	Establishment new tube well for clean drinking water	3,68,000
Animal health camp	Deworming and vaccination of large and small ruminants	30,000
Pulse and oil seed minikit programme	Oil seed (Ground nut, mustard) and pulse minikit Green gram)	55,000
Cluster demonstration	NFSM cluster demonstration (green gram)	40,000

### 6.1 Impact of each intervention (around 100 words):

All the above activities/works are very essential for the farmers/villagers of NICRA and other villages. Like drinking water facilities, which is not implemented by NICRA programme, but very important during the flood and cyclone. Repair and construction of new road which required for every person, which need to be done by Government and Government also taken up the construction of new road in NICRA village. Similarly animal health camp is very important for the safety of livestock and under the NICRA programme we could not do it or after NICRA programme it would be conducted by Government. Under NICRA programme the farmers are aware about the benefit of Animal health camp and now they are contacting the line department and conducting the animal health camp regularly in their villages.

### 7. Dignitaries visited NICRA Villages during 2017-18

Name of KVK	Name of VIPs/Experts	Date of visit
Kendrapara, Odisha	Prof. H. K. Senapati, Former Dean PG-cum-DRI, OUAT , Chairman Zonal Monitoring Team of NICRA projects.	31.10.2017

	Dr. Md. Osman, NICRA-TDC Coordinator as CRIDA Nominee as Vice-Chairman Zonal Monitoring Team of NICRA projects.	31.10.2017
	Dr. B. Maji, Principal Scientist & Former Head, ICAR-CSSRI Canning Town as DDG (NRM) Nominee	31.10.2017
	Dr. P. K. Roul, Dean Extension Education, OUAT Bhubaneswar, Member Secretary	31.10.2017
	Dr. F. H. Rahman, Principal Scientist, ICAR-ATAR Kolkata, Member Secretary	31.10.2017
	Miss. Riya Bhattacharya, SRF, NICRA, ICAR ATARI Kolkata	17.11.2018
	Mrs. Jhumur Basak, SRF, CFLD, ICAR ATARI Kolkata	17.11.2018

Sd/-

Sr. Scientist & Head  
KVK, Kendrapara, Odisha

## 8. Success stories:

### 1. Cultivation of flood tolerant rice variety Swarna sub -1

- Prevailing situation : Cultivation of rice varieties Swarna/Pooja/Sarala damaged due to 12-15 days submerge condition
- Technology demonstrated : Cultivation of flood tolerant rice varieties Swarna sub - 1, tolerant to 15-17 days submerge condition
- Economic security: 200 % Cropping Intensity, 440 ha Swarna /Pooja/ sarala etc. cultivated area replaced with Swarna sub - 1 in the district
- Social security: 170 mandays per ha per year, reduced in crop loss
- Environmental security : increase in soil fertility and crop stands in flood condition,
- Impact : 440 ha x Rs. 28,000/- = Rs. 1,23,20,000 net profit per annum, 74,800 mandays of farm work created every year, App. Rs. 40,00,000/- spent by department for upscaling the technology in entire Kendrapara district during 2012-13 to 2017-18









## 2. Post flood potato cultivation

- Prevailing situation : After flood the farmers are not taken any crop in river bank area
- Technology demonstrated : Cultivation of potato in post flood situation
- Economic security: 200 % Cropping Intensity, 80 ha of river bank area converted to potato cultivation in post flood situation, Net income Rs.80.000/- per ha
- Social security: 215 mandays per ha per year, increase in family income
- Environmental security: increase in soil fertility ,farm biodiversity ,efficient use of silt in post flood situation.
- Impact : 80 ha x Rs. 80,000/- = Rs. 64,00,000 net profit per annum, 17,200 mandays of farm work created every year, App. Rs. 12,00,000/- mobilized from Department for upscaling the technology in the entire Kendrapara district during 2012-13 to 2017-18







### 3. Low cost improved Goat housing system

- Prevailing situation : Difficult in cleaning of goat house , disease like enterotoxemia, pneumonia, PPR along with worm infestation of goat during flood/post flood situation due to the traditional method of goat keeping ( house with mud floor)
- Technology demonstrated : Improved goat housing system for proper management of goat during flood/post flood situation with animal health camp.
- Economic security: The disease like enterotoxemia, pneumonia, PPR along with worm infestation are reduced leading to less mortality ( 70-100 % to 12 %)18 traditional method of goat keeping ( house with mud floor) converted to low cost goat housing system,Net income Rs.44,000/- per farmer per year.
- Social security: Reduction in mortality encourage the farmer to go for goatery even in adverse climatic condition,18 farmers engaged ( 1/4 mandays/day) for goatery through out the year
- Environmental security: As the goats are kept in-side the goat the environment is clean in flood/post flood situation
- Impact : 8X Rs.12,000/- = Rs. 7,92,000 net profit per annum,1620 mandays of farm work created every year,Rs. 3,50,000/- mobilized from Department for upscaling the technology in the entire Kendrapara district during 2012-13 to 2017-18





#### 4. Low cost portable poultry housing system for backyard poultry

- Prevailing situation : The mortality of the birds are high during the heavy rain, flood /post flood situation and high temperature due to the lack of proper shelter
- Technology demonstrated: Low cost portable poultry housing system with affordable price for the farmers i.e. Rs.3,200/- (Rupees two thousand two hundred only) with (12X6) feet size. The unit also transport easily from one place to another place as per the climatic condition.
- Economic security: The diseases like Coccidiosis, Sodium deficiency, Coillbacillosis, Ascariasis, IBD,RD and MD are reduced leading to less mortality ( 70-100 % to 4 %), 126 mud house shelter converted to low cost portable poultry house ,Net income Rs.12,000/- per farm women with rearing of 25 birds per batch , 3 batch in a year.
- Social security: Reduction in mortality encourage the farm women to go for backyard poultry even in adverse climatic condition,126 farm women engaged their leisure time ( 1/4 mandays) for back yard poultry throughout the year
- Environmental security: As the birds are kept in-side the poultry house the environment is clean in flood/post flood situation
- Impact : 146 x Rs. 15,000/- = Rs. 15,12,000 net profit per annum, 11,340 mandays of farm work created every year in the entire Kendrapara district during 2012-13 to 2017-18



Sd/-

Sr. Scientist & Head  
KVK, Kendrapara, Odisha