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International Crops Research Institute
for the Semi-Arid Tropics

June 11, 2014

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Odisha

Subject: **2013 Physical and Financial Accomplishment Report** and **2014 Physical Targets** under the RKVY funded project **'Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology in Rainfed Upland Ecosystems of Odisha'**

Dear Mr Gopalan:

Greetings!

We are pleased to submit a three-section report covering the '**2013 Physical and Financial Accomplishment**' and '**2014 Physical Targets**' under the RKVY funded project '**Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology in Rainfed Upland Ecosystems of Odisha**'. The year 2013-2014 cropping season for pigeonpea showed a remarkable breakthrough for the Odisha project and saw a farmer from Rayagada, Odisha, proclaimed as the National Awardee for "**Krishi Karman Award for Progressive Farmers**" on pulses (pigeonpea) on 10 February 2014 by no less than the President of India, **Shri Pranab Mukherjee**. The said recognition was the first for Odisha particularly on pigeonpea. Another noteworthy achievement of the project was the investment gain by as much as 400% (Rs 406 Million) as compared to the project investment of Rs 72.6 Million for three years.

The institutionalization of the seed system was a result of producing 691 tons of various seed classes (Foundation, Certified and TL seeds) of farmer-preferred varieties (ICPL 14001, ICPL 14002, ICP 7035, and ICPL 88039) and hybrids (ICPH 2671 and ICPH 2740). To continuously sustain the requirements of quality seeds in the seed system, ICRISAT produced a total 6,169 kgs of nucleus/breeder seeds which will be made available to the project for 2014-2015 cropping season. The improved pigeonpea production technology (IPPT) resulted in producing a total 4,200 tons of commercial seeds (ICPL 14001, ICPL 14002, ICP 7035, ICPH 2671 and ICPH 2740) registering 32% increase in productivity as against their landrace.

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There was a remarkable increase in stakeholder (farmers, DA Officers and Technicians, NGOs, and ICRISAT staff) participation in capacity building and awareness in relation to pigeonpea cultivation. A total of 21,146 participants (including 3,100 women) attended various meetings, seminar-workshops, trainings on crop seed production of hybrid and varieties, IPM/IDM, exposure visits, and dal mill and godown operation and management. Backing-up the said activities is the distribution of 22,000 copies of farmer friendly literature in the local Oriya language. In addition, information on project implementation, activities and gains was disseminated through publications, local and international print and electronic media for wider circulation among the stakeholders.

The operationalization of dal mills for value addition in Rayagada, Kalahandi, and Nauparha provided a cheap source of processed pigeonpea dal at the doorstep of smallholder farmers in these villages and adjacent areas. It also offered additional livelihood to women self-help groups (SHGs) and NGOs using inclusive market-oriented development (IMOD) approaches. Likewise, the construction of a 25-metric ton godown at Rayagada and a 100-metric ton godown at Kalahandi has enabled farmers to store their seeds appropriately.

We wish to thank you very much for your continuous support for the project.

Very truly yours,

William D Dar
Director General

Cc: Dr Saroj Das, Director for Pulses, Odisha
Dr C L L Gowda, Deputy Director General-Research, ICRISAT
Ms. Joanna Kane-Potaka, Director, Strategic Marketing and Communication, ICRISAT
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2013 Accomplishment Report
(June 2013--May 2014)

2014 Physical Targets

Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology in Rainfed Upland Ecosystems of Odisha

Technological Empowerment and Sustainable Livelihood'

Compiled and Written by **MG Mula** and **KB Saxena**

The Director

Department of Agriculture and Food Production
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(RKVY Sub-scheme)

This work has been undertaken as part of the CGIAR Research Program on Grain Legumes

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International Crops Research Institute for the Semi-Arid Tropics

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2013 Physical and Financial Accomplishment Report

List of Partners

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Department of Agriculture	RS Gopalan	Director
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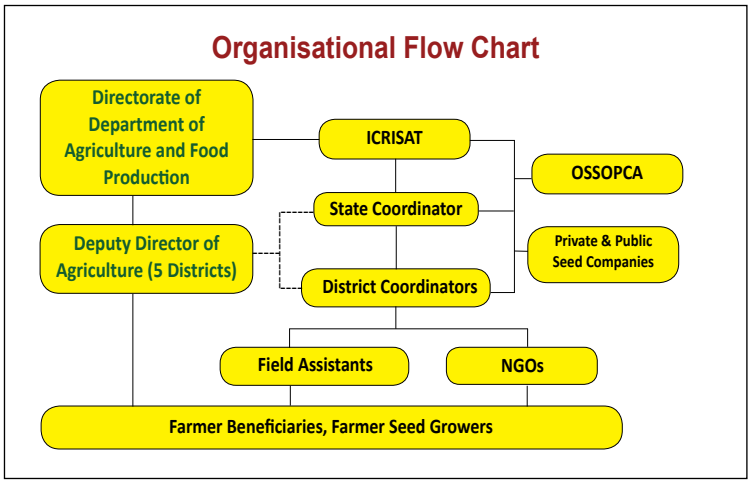
	Mr A Mandal	DDA – Nauparha
	Mr KC Singh	DDA – Rayagada
	Mr A Sahu	DDA – Kalahandi
	Mr K Gouda	DDA – Boudh
	Mr M Mallik	DDA – Bolangir
ICRISAT	Dr WD Dar	Director General
	Dr R Varshney	Director – Grain Legumes
	Dr MG Mula	Scientist/Project Investigator
	Mr RV Kumar	Manager, Field Research Operations
	Mr S Tripathy	State Coordinator
	Mr P Singh	Dist. Coordinator (Kalahandi)
	Mr Y Naik	Dist. Coordinator (Nauparha and Bolangir)
	Mr S Mohanty	Dist. Coordinator (Rayagada and Boudh)
Sahabhagi Vikash Abhiyan (SVA) NGO	Mr J Pradhan	President, Nauparha Dist.
LOKSEBAK NGO	Mr AP Mohanty	Secretary, Kalahandi Dist.
People's Forum NGO	Mr SK Samal	Program Manager, Boudh Dist.
Shramika Shakti Sangha NGO	Mr TS Dharua	President, Bolangir Dist.
Centre for Social Action and Tribal Development NGO	Mr PK Pradhan	Secretary, Rayagada Dist.
Odisha State Seed & Organic Product Certification Agency (OSSOPCA)	Mr CS Rao	Director



The flow chart shows the organizational setup of the project's relationships and procedures in such a way that partnership can obtain the best results from the various efforts. The chart illustrates the structure of the project in terms of relationships among personnel or departments, as well as distinctively showing the lines of authority and responsibility within the project.

Figure 1. Project's Organizational Flow Chart.

Executive Summary

The project 'Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology in Rainfed Upland Ecosystems of Odisha' was funded by the Department of Agriculture and Food Production, Government of Odisha, India, through the Rashtriya Krishi Vikas Yojana (RKVY) sub-scheme 353 No. 15(03)/19/2011). The project was approved on 23 May 2011 for a period of 4 years with a total budget of ₹ 10.253 crore (US$2.29 million). The project was officially launched on 09 August 2011 at ICRISAT Headquarters, Patancheru.

In its third year of implementation the project has seen an increase both in the total area sown under pigeonpea as well an increase in the productivity. This was possible due to ICRISAT's intervention in terms of improved production practices and the adoption of high yielding varieties and hybrids.

A total area of 6,940 ha was covered under the project compared to the physical target of 6,740 ha. For Improved Pigeonpea Production Technology (IPPT) the total area sown was 5,718 ha. A total 105 sites or 42 ha (with 72 successful sites or 30 ha) Farmer Preferred Varietal Selection Trials (FPVST) were conducted; and 1,180 ha was utilized for seed production of which 818 ha produced various seed classes (foundation, certified and truthfully labeled seeds) of farmer preferred varieties and hybrids.

Similarly an increase was observed in IPPT – productivity of 764 kg/ha compared to 522 kg/ha for the landrace. This resulted in a total production of 4,200 tons benefitting 8,982 smallholder farmers including 922 women (10%). The farmer-preferred varieties were sown in different cropping systems as an intercrop with cotton, maize, groundnut, upland rice, finger millet, and cucumber, along rice bunds or as sole crop. In some districts, it served as a soil conservation mechanism, especially in the upland areas of Kalahandi. Likewise, smallholder farmer seed growers successfully enhanced various seed classes of farmer preferred varieties and hybrids by producing 691 tons, an increase of 33% compared to last season's production of 491 tons (following same hectarage of cultivation). In this respect, the project has procured from farmer seed growers 78.1 tons of various seed classes for the 2014 cropping season. This concept was introduced to strengthen the seed delivery system of the state by continuously supplying quality seeds to smallholder farmers on time. To backstop the seed supply chain, ICRISAT has produced and supplied breeder seeds and hybrid parents of farmer preferred varieties and hybrids. This resulted in producing 6,169 kgs of 29 high yielding cultivars.

To constantly respond to farmers' need of new high yielding cultivars, the FPVST showcased 5 hybrids and 2 varieties and results revealed that average yield of hybrids and varieties is 1811 kg/ha and 1491 kg/ha, respectively as compared to its landrace of 791 kg/ha or an increase of 50%.

A new element of this project is the introduction of early duration pigeonpea and chickpea in the rice-fallow cropping system. Data showed that around 1.3 million ha across the state are under the rice-fallow cropping system. About 75% of the cultivated area is red soil and 25% black soil. This concept opens up the possibility of smallholder farmers obtaining additional livelihood and fodder for their livestock to supplement rice as the main source of income. Additionally the legumes will improve soil structure which will benefit succeeding sowings of rice and be a source of feed/fodder for poultry and livestock, as well as fuel wood for the farmer.

There was also an increase in the number of stakeholders (farmers, DA officers and technicians, NGOs, and ICRISAT staff) in capacity building and awareness in relation to pigeonpea cultivation.

A total of 21,146 participants (including 3,100 women) attended various meetings, seminar-workshops, trainings on crop seed production of hybrid and varieties, IPM/IDM, exposure visits, and dal mill and godown operation and management, which were held at different locations. Around 22,000 copies of various types of information and communication material in the local Oriya language were distributed among the stakeholders. In addition, information on project implementation, activities and gains was disseminated through publications, local and national print and electronic media for wider circulation among the stakeholders.

In order to enhance the value chain, three village level dal mills (including polisher and generator) were supplied through the project. They are operated by self-help groups and NGOs (Loksebak and SVA) at Rayagada, Kalahandi, and Nauparha districts. Seed storage facilities have been enhanced with the construction of a 25 metric ton godown at Rayagada and a 100 metric ton godown at Kalahandi.

The overall performance of the project has shown clearly the increase in investment gain by as much as 400% (₹ 406 million) compared to the project investment of ₹ 72.6 million for three years. Not only are smallholder farmers happy with the project as documented in the book 'Odisha Success Stories' but the 'Krishi Karman Award for Progressive Farmers' bestowed by President of India Shri Pranab Mukherjee on Mr Pradip Kumar Panda a farmer from Rayagada is also a testimony to the success of the project. This award given on 10 February 2014 is a first for Odisha particularly in pigeonpea cultivation.

1. Background Information

In the state of Odisha 70% of the population lives in the rainfed upland ecosystem and around 85% of the workforce is dependent on agriculture. The total agricultural land in the state is around 8.7 million ha of which 70% is rainfed. In the case of pulses both the total agricultural area as well as the production has been declining over the years – the production of pulses has been reduced to 56.4% in the last ten years. The districts of Rayagada, Kalahandi, Boudh, Bolangir and Nauparha were selected for the project because of their dry and rainfed ecology. About 53,350 ha of total tillable area is suitable for new high yielding pigeonpea varieties and hybrids in the five districts. The project intends to introduce and expand the production of ICRISAT high yielding pigeonpea varieties and hybrids by means of adaptation, selection and promotion through a farmer participatory approach.

Pigeonpea is mainly grown on rainfed upland areas and is one of the most important pulse crops of the state. It is an affordable source of protein (22-24%) and contains carbohydrates, minerals and vitamins and a source of essential amino acids. Thus, pigeonpea can be an excellent crop to promote food and nutritional security in Odisha. However, its productivity is low in Odisha at 415 kg/ha compared to the national average of 700 kg/ha. It also has a very low seed replacement ratio of 2-3%. A large section of farmers in the rainfed upland ecosystems of Odisha have remained isolated from improved cultivars and management practices of pigeonpea for various reasons. There is ample scope for the expansion of high yielding short and medium duration pigeonpea varieties and hybrids in the rainfed areas for the development of sustainable livelihoods. It is mainly for these reasons that this project was implemented.

2. Project Benefit in Three Years (2011-2013 cropping season)

In a span of three years from 2011-2013, the benefit gained was ₹ 406 million against the total investment of ₹ 72.6 million, an increase of more than 400%. The calculation is based only on the production of the IPPT and seed production (SP). The achievement benefited 26,827 smallholder farmers including 1,947 women. Likewise, during the three year period, 15,614.5 ha were covered by the project as against the targeted area of 15,220 hectares – an increase of 394.5 hectares.

Table 1. Project Benefit in 3 years (2011-2013).

Year	Budget allocation (₹ m)	Program	Area (ha)		No. of farmers	Total production (t)	Estimated value (₹ m)	% Investment gain I = (b vs h)
			Target	Actual				
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	
2011	21	IPPT	2000	2102	5718	572	26	
		SP	1000	1000	1667	318	19	
2012	24	IPPT	4000	4069.6	6353 (385F)	2,102	95	
		SP	1262	1300	1437 (67F)	590	35	
2013	27.146	IPPT	5718	5973.4	9983 (1358F)	4,201	189	
		SP	1240	1169.5	1669 (137F)	691	42	
Total	72.6		15,220	15,614.5	26,827 (1947F)	8,474	406	>400%

3. Mid-Term Impact Assessment Study (2011 and 2012 cropping season)

The results of the mid-term impact assessment study capture project success in achieving its initial goals. The goals were: (i) evaluate and identify newly developed high yielding disease resistant pigeonpea varieties and hybrids in marginal soils; (ii) develop village-level seed delivery systems to achieve self-sufficiency in seeds; (iii) capacity building of farmers, self-help groups, NGOs and agri-technicians in sustainable production technology components; (iv) enhance profitability by linking production with dal processing and marketing; and (v) provide research backstopping for refinement and IPPT components.

The study covered a wide socio-demographic sample covering all age groups, marital status and educational qualifications. The study recorded an increase in women participation by 34%. The women learned line sowing as well as improved seed storage practices and various cultural management practices. Farmers were introduced to a number of technologies which were not practised before the project started such as the introduction of new high yielding varieties (ICPL 14002, ICPL 14001, ICP 7035) as against their landraces; seed rate improving from farmers' practice of 20-25 kg/ha to 12 kg/ha; application of fertilizer (DAP at 100 kg/ha); application of insecticide, weeding, and line sowing in ridges. Using these technologies, a noticeable increase was seen in the productivity by at least 70% as against landraces and net income by at least 170-190%.

Overall, results obtained are very positive and suggestions made by the study are under consideration. The positive achievements of the project highlights the need for continued support for the project not only because of the current investment gain but also due to projected increase in production especially in Rayagada and Boudh by year 2020.

4. Physical Accomplishments

4.1 Improved Pigeonpea Production Technology (IPPT)

Majority of the farmers in Odisha cultivate pigeonpea landraces. Around 80-85% of smallholder farmers plant pigeonpea as an intercrop (either with cotton, groundnut, maize, upland rice, or finger millet), along rice bunds and along fish pens. Farmers normally do not apply any inputs (fertilizer and pesticides) and do not practice weeding in sole cropping. The intervention of the project in the IPPT was only through the provision of certified seeds of new high yielding varieties and hybrids (ICPL 14002, ICPL 14001, ICPH 2671, and ICPH 2740) along with capacity building courses and distribution of literature on cultural management and practices, integrated pest management (IPM) and integrated disease management (IDM).

The introduction of improved technologies such as line sowing in ridges, spacing, and other cultural management practices such as integrated disease and pest management, are crucial in improving farmers' awareness of the management of pigeonpea. A total of 5,718 hectares were sown under IPPT giving a total production of 4,200 tons and productivity of 764 kg/ha (better than the landrace at 522 kg/ha). However, records showed that only 5,498 hectares were harvested, benefitting 8,982 smallholder farmers including 922 women (10%) (Table 2). Reasons for decrease in area by 220 hectares were: (i) water logging due to continuous rainfall during sowing and early vegetative stage (especially for those farmers who did not follow the recommended line sowing in ridges), (ii) late sowing and (iii) damage from insect pests and drought. In addition, among the five districts, Rayagada and Kalahandi performed better in terms of productivity at 931 kg/ha and 881 kg/ha, respectively as compared to the other districts (Table 2). It can be deduced from these findings that pigeonpea, when intercropped with other

crops, has higher productivity than when it is a sole crop. This is because of the availability of fertilizer from that applied to the main crop and the use of other management practices, such as spraying against pest and diseases, and weeding. Moreover, in sole cropping, the use of quality seeds of high yielding varieties of pigeonpea gave 30% better yield than its local counterpart even when no fertilizer was used and cultural management and practices adopted.

4.1.1 Rayagada

The average yield obtained by farmers from the varieties and hybrids is 931 kg/ha (an increase over last year's productivity of only 414 kg/ha) or 29% higher than their local cultivar of 662 kg/ha (Table 2). A total 785 ha was cultivated benefiting 1,615 smallholder farmers including 103 female farmers. Total production by the district was 730 tons.

4.1.2 Kalahandi

The average productivity of the varieties and hybrids was 881 kg/ha (an increase over last season's productivity of 791 kg/ha) higher than their landraces at 637 kg/ha (Table 2) or 28% more yield. A total 1,775 ha was sown under various cropping systems benefiting 1,879 smallholder farmers including 133 women farmers. Total production by the district was 1,563 tons.

4.1.3 Nauparha

A total of 1,788 ha was planted with high yielding varieties and hybrids (having a total production of 1,109 tons) serving 3,902 smallholder farmers (including 375 women). Productivity level was recorded at 620 kg/ha, an increase of 42% as compared to last season's productivity of only 362 kg/ha (Table 2). Moreover, the productivity was 37% higher than their landrace.

4.1.4 Boudh

As shown in Table 2, 701 smallholder farmers (79 women) benefited from sowing 650 ha of pigeonpea varieties (ICPL 14002 and ICPL 14001). Production and productivity was recorded at 453 tons and 697 kg/ha, respectively (Table 2). Productivity level was 32% higher than their landrace (475 kg/ha).

4.1.5 Bolangir

Production and productivity of the district was 344 tons and 688 kg/ha, respectively covering 500 ha benefiting 885 smallholder farmers including 232 female farmers (Table 2). Productivity was 35% higher than their local landrace.

Table 2. Status of improved pigeonpea production technology (IPPT) in 5 districts.

District	Block	Cultivar	Farmers (no.)	Area (ha)	Total production (t)	Average yield (kg/ha)	Landrace average yield (kg/ha)
Rayagada	Rayagada	ICPL 14002 / ICPL 14001	365 (15F)	25/115	128.58	918	700
	Kolnara	ICPL 14002 / ICPL 14001 / ICPH 2740	359 (21F)	21/134/2	150.82	961	700
	K.singhpur	ICPL 14002 / ICPL 14001 / ICPH 2740	225 (10F)	25/130/2	133.34	849	600
	Ramnaguda	ICPL 14002 / ICPL 14001 / ICPH 2671	666 (57F)	85/242/4	317.82	960	650
Sub-Total			1615 (103F)	785	730.56	931	662
Kalahandi	Bhawanipatna	ICPL 14002 / ICPL 14001	656 (27F)	200/400	517.34	862	650
	Kesinga	ICPL 14002 / ICPL 14001 / ICPH 2740	126 (19F)	90/14/4	108.63	1006	650
	Narla	ICPL 14002 / ICPL 14001	127 (17F)	60/107	146.05	874	580
	Lanjigarh	ICPL 14001	246 (15F)	200	164.66	823	680
	Dharmagarh	ICPL 14001	100 (4F)	100	84.09	841	600
	Golamunda	ICPL 14001	304 (15F)	200/100	255.32	851	620
	Th.rampur	ICPL 14002 / ICPL 14001 / ICPH 2671	320 (36F)	200/100	287.54	958	680
Sub-Total			1879 (133F)	1775	1563.63	881	637
Nauparha	Komna	ICPL 14002 / ICPL 14001 / ICPH 2671/2740	1411 (116F)	239.4/254/64.4/19.8	375.55	650	462
	Khariar	ICPL 14002 / ICPL 14001 / ICPH 2671/2740	1150 (87F)	216/192/37.2/28	307.79	650	447
	Sinapali	ICPL 14002 / ICPL 14001 / ICPH 2671/2740	967 (59F)	259/173.4/47/21	312.75	652	403
	Boden	ICPL 14002 / ICPL 14001 / ICPH 2671/2740	374 (113F)	91.2/109.2/20.5/16.5	113.32	477	254
Sub-Total			3902 (375F)	1788.6	1109.41	620	392
Boudh	Kantamal	ICPL 14002 / ICPL 14001	520 (56F)	290/210	361.89	724	500
	Boudh	ICPL 14002 / ICPL 14001	181 (23F)	60/90	91.32	608	450
Sub-Total			701 (79F)	650	453.21	697	475
Bolangir	Bangomunda	ICPL 14002 / ICPL 14001 / ICPH 2671/2740	453 (109F)	125/133/7/8	193.60	709	485
	Muribahal	ICPL 14002 / ICPL 14001 / ICPH 2671/2740	432 (123F)	173/37/9/8	150.31	662	405
Sub-Total			885 (232F)	500	343.91	688	445
Total			8,982 (922F)	5,498.6	4,200.72	764	522

4.2. Farmer Participatory Varietal Selection Trial (FPVST)

One of the objectives of this project is to notify smallholder farmers of new technologies including high yielding cultivars through FPVST. The project provided seven high yielding cultivars (2 varieties and 5 hybrids) to look into adaptability and performance in comparison with the existing local varieties through improved production practices. Aside from the seeds (at the rate of 8 kg/ha for variety and 4 kg/ha for hybrids), fertilizer at the rate of 100 kg/ha of DAP and insecticide were supplied. The straight line method of planting on ridges was followed for all the trials. Of the 105 sites established, only 72 sites were successful as the others were damaged during sowing and early vegetative stage due to continuous rainfall and poor management.

Although all the hybrids and two varieties tested showed significant average yield ranging from 1100-1900 kg/ha in all locations as compared to landrace (791 kg/ha), results revealed that among the hybrids, ICPH 3933 produced the highest mean yield of 1907 kg/ha followed by ICPH 2671 (1,859 kg/ha) and ICPH 3762 (1,801 kg/ha) (Table 3). The study showed that growing hybrids and varieties with improved cultural management and practices will increase productivity by as much as 50% more than the existing landrace.

Table 3. Status of FPVST in five districts.

		Average yield (kg/ha)							
District	Site (no.)	ICPH 2671	ICPH 2740	ICPH 3762	ICPH 2751	ICPL 20108	ICPL 7035	ICPH 3933	Local (check)
Rayagada	25	2470	2410	2290	2259	2350	1146	-	903
Boudh	3	1177	1067	1176	1067	1398	-	-	662
Bolangir	11	1666	1688	1804	1707	1696	-	-	676
Kalahandi	12	2031	1944	2000	1932	-	987	2191	803
Nauparha	21	1953	1754	1734	1619	-	1370	1624	912
Total	72	1,859.4	1,772.6	1800.8	1716.8	1,814.7	1,167.7	1,907.5	791.2

4.3. Seed systems

There is a need to continuously enhance and strengthen the formal and informal seed sector of the state to sustain the supply of quality seeds and new high yielding cultivars required by smallholder farmers. As part of this project a seed system model was developed to implement the 'one village one variety' concept (Figure 2) because the formal seed sector cannot ensure timely supplies of the huge volume of quality seeds required by the farmers. The benefit of partnering with OSSOPCA, has been to the strengthening and institutionalizing of the informal seed production system in the districts of Kalahandi, Nauparha and Rayagada.

The project started by identifying villages and providing them with one farmer preferred variety and hybrid parent material suited to the type of soil. The participation of OSSOPCA was critical in monitoring and maintaining good quality seeds of farmer-preferred varieties and hybrids. An isolation distance of 300 m between varieties and 500 m for hybrid seed production was initiated. This concept has resulted in the production of 691 tons of various seed class (Breeder, Foundation, Certified and Truthfully Labeled).

Continuous delivery of pure seeds to farmers will enhance seed production and quality of seeds. ICRISAT will continuously supply Breeder seeds of farmer-preferred varieties and parental lines of hybrids to selected progressive farmer seed growers to multiply into Foundation and hybrid

seeds. The Foundation seeds produced by farmer seed growers will then be distributed to selected farmer seed growers for seed multiplication of Certified and TL seeds. The entire seed production process will be carried out under the supervision of OSSOPCA for monitoring and certification.

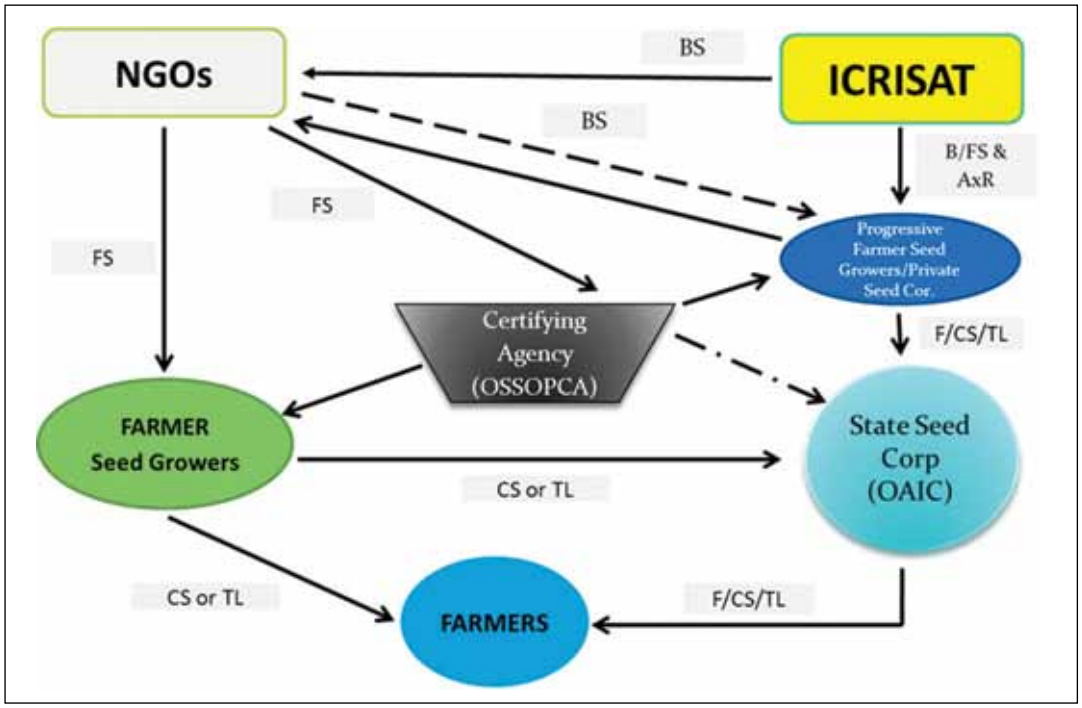


Figure 2. Seed system model in the Odisha pigeonpea project.

4.3.1. Seed certification

Seed certification of Foundation and Certified seeds of varieties (ICPL 14002, ICPL 14001, ICP 7035 and ICPL 88039) was conducted by OSSOPCA. A total of 1,180 ha was under the seed production program of which 1,052 ha (89%) was registered. However, during the process of certification, 675.4 ha was approved for certification while 456 ha was rejected due to problems as shown in Table 4.

Table 4. Status of certified area for varieties by OSSOPCA.

	Area (ha)				
District	Sown	Registered	Certified	Rejected	Remarks
Kalahandi	440	382	322.6	59.4	Lack of isolation, poor plant population, damage caused by heavy rainfall during sowing.
Rayagada	290	290	102.8	187.2	Damage by heavy rainfall, lack of isolation, off type plants, mixed cropping, variety notification problem.
Nauparha	450	380.25	240	210	Damage caused by heavy rainfall after sowing & during flowering stage, variety notification problem.
Total	1,180	1,052.25 (89%)	675.4 (64%)	456.6 (43%)	

4.3.2. Certified seed production

A total of 585 tons of Certified seeds was produced in 682 ha benefiting 1,335 smallholder farmers (including 111 female farmers) (Table 5). The average yield for the three districts was 857 kg/ha an increase of about 34% from last year's productivity of 562 kg/ha. Rayagada produced the highest productivity of 1093 kg/ha as compared to the two districts.

4.3.2.1 Rayagada

The total production of Certified seeds was 86 tons from 78 ha benefiting 313 smallholder farmers including 19 women farmers (Table 5). The average yield was 1,093 kg/ha. The reasons for success were the protocol of seed production (line sowing, ridges and providing inputs such as fertilizers and chemicals against pests and diseases).

4.3.2.2 Kalahandi

Seed production of Certified seeds totaled 257 tons from 286 ha benefiting 461 farmers including 31 women farmers (Table 5). The productivity is 899 kg/ha an increase of 35% from last year's productivity of 580 kg/ha. It is noted that ICPL 14002 variety produced the highest yield in all the blocks.

4.3.2.3 Nauparha

A total of 242 tons was harvested from 318 ha with an average productivity of 761 kg/ha benefiting 561 farmers including 61 women farmers (Table 5). The productivity is 16% higher compared to last year's figure of 650 kg/ha.

Table 5. Certified seed production by district and block.

District	Block	Variety	Farmer (No)	Area certified (ha)	Total production (t)	Average Yield (kg/ha)
Nauparha	Komna	ICPL 14002	128 (10F)	90	69.50	772
	Khariar	ICPL 14002	71 (4F)	40	31.75	794
		ICP 7035	51 (1F)	25	18.32	733
	Sinapali	ICPL 14001	238 (21F)	118	92.41	783
		ICP 7035	9	12	8.02	668
	Boden	ICPL 14002	36 (16F)	20	12.00	600
		ICP 7035	28 (9F)	13	10.00	769
Sub-Total			561 (61F)	318	242	761
Kalahandi	Bhawanipatna	ICPL 14002	8	7	7.05	1007
		ICPL 14001	15 (9F)	6	5.69	948
		ICP 7035	10	12	9.93	802
		ICPL 88039	15 (1F)	8	0.81	101
	Kesinga	ICPL 14002	218 (12F)	135	154.26	1143
		ICP 7035	18 (1F)	23	20.06	872
		ICPL 88039	23	17	0.66	39
	Narla	ICPL 14002	12 (1F)	6	6.58	1097
		ICPL 14001	11	4	3.22	805
		ICPL 88039	2	8	1.05	131
	Lanjigarh	ICPL 14002	10	5.2	5.44	1146
		ICPL 14001	61 (2F)	25	23.7	948
		ICP 7035	11	7	6.68	954
		ICPL 88039	20 (2F)	9	1.14	127
	Golamunda	ICPL 14002	10 (3F)	3	3.44	1147
		ICPL 14001	6	3.6	3.04	844
		ICP 7035	7	4	4.34	1085
		ICPL 88039	4	3	0.32	107
Sub-Total			461 (31F)	285.8	257.11	899.6
Rayagada	Rayagada	ICPL 14002	7	5.20	5.48	1054
		ICPL 14001	92	6.80	7.04	1035
		ICP 7035	23 (10F)	3.60	3.30	9.17
	Kolnara	ICPL 14002	30	20.00	21.19	1059
		ICPL 14001	44 (2F)	25.80	30.39	1178
		ICP 7035	23	2.00	2.90	1450
	K.singhpur	ICPL 14002	9	0.80	0.57	713
		ICPL 14001	66 (7F)	10.60	11.52	1087
		ICP 7035	19	4.00	3.75	938
Sub-Total			313 (19F)	78.80	86.14	1093
Total			1335 (111F)	682.60	585.25	857.40

4.3.3. Foundation seed production

A total of 95 ha was set aside for Foundation seed production of various types of seeds of farmer-preferred varieties covering three districts. Total production was 87 tons with productivity of 924 kg/ha benefiting 178 farmer seed growers including 18 women farmers (Table 6). Among the districts, Rayagada had the highest productivity of 1,206 kg/ha, an increase of 76% over last year's productivity of 285 kg/ha.

4.3.3.1 Nauparha. A total of 33 tons was produced in 31 ha with a productivity of 1,063 kg/ha benefiting 66 smallholder farmers including 9 women farmers as seen in Table 6. There was a 55% increase in productivity compared to last year's performance of 478 kg/ha. The reason for the increase was the application of required agronomic cultural management and practices such as irrigation, weeding, and timely spraying of insecticide.

4.3.3.2 Rayagada. A total 25 ha was cultivated to produce 30 tons of Foundation seeds of ICPL 14001 and ICP 7035 benefiting 76 smallholder farmers including 5 women farmers (Table 6). This district produced the highest yield of 1,206 kg/ha by adopting ICRISAT technologies.

4.3.3.3 Kalahandi. Total production of Foundation seeds was 24 tons in 38 ha cultivated benefiting 36 smallholder farmers of which 4 are women farmers (Table 6). Productivity was recorded at 624 kg/ha an increase of about 33% as compared to last season's productivity of 420 kg/ha.

Table 6. Foundation seed production by district and block.

District	Block	Variety	Farmer (No)	Area Certified (ha)	Total Production (t)	Average Yield (kg/ha)
Nauparha	Khariar	ICPL 14002	7	3.8	4.32	1137
		ICP 7035	24 (1F)	12	9.56	797
	Komna	ICPL 14002	12 (4F)	9	7.76	862
	Sinapali	ICPL 14001	23 (4F)	14.8	11.86	801
Sub-total			66 (9F)	31.5	33.5	1063
Rayagada	Rayagada	ICP 7035	55 (5F)	2	2.32	1160
	Kolnara	ICPL 14001	3	18	22.35	1241
	K.singhpur	ICPL 14001	10	4.2	4.71	471
		ICP 7035	8	0.8	0.77	962
Sub-total			76 (5)	25	30.15	1206
Kalahandi	Narla	ICPL 14002	4	4.2	4.34	1033
		ICPL 88039	2 (1F)	7	0.82	117
		ICP 7035	1	2	2.1	1050
		ICPL 161	1	0.4	0.2	500
	Kesinga	ICPL 87091	1	1	0.05	50
	Bhawanipatna	ICPL 14001	16 (1F)	7	5.61	801
		ICPL 88039	1	3	0.45	150
		ICP 7035	6 (1F)	7	5.18	740
	Th.Rampur	ICPL 14002	1	2	1.8	900
		ICPL 88039	1 (1F)	2	0.21	105
		ICP 7035	2	2.6	3.1	1192
Sub-total			36 (4F)	38.2	23.85	624
Total			178 (18F)	94.7	87.5	924

4.3.4. Seed production of hybrids

Hybrid technology is new to Odisha. Although the project has been operational for two years, farmer seed growers, NGOs and technicians should continuously be trained to produce quality seeds.

4.3.4.1 Hybrid seed production (AxR). Two promising hybrids – ICPH 2671 and ICPH 2740 – were introduced for seed multiplication in hybrid commercial seeds. A total of 33 hectares was sown giving a production of 16 tons (Table 7). The seeds (A-Line) will be utilized as commercial hybrids in the IPPT field in the coming 2014 cropping season.

Table 7. Hybrid seed production (AxB) by district and block.

					A-Line		R-Line	
District	Block	Hybrid	Area (ha)	Farmer (No)	Total production (t)	Average yield (kg/ha)	Total production (t)	Average yield (kg/ha)
Kalahandi	Lanjigarh	ICPH 2740	0.5	1	0.14	280	0.05	100
	Kesinga	ICPH 2740	2	1	0.04	20	0.03	15
	Narla	ICPH 2740	2	1	0.56	280	0.80	400
	Dharmagarh	ICPH 2740	1	1	0.25	250	0.09	90
	Bhawanipatna	ICPH 2740	1	1	0.22	220	0.12	120
Sub-Total			6.5	5	1.21	186	1.09	168
Nauparha	Boden	ICPH 2740	9	12 (4F)	6.61	734	2.03	226
	Komna	ICPH 2671	4.6	7	3.66	796	1.34	291
	Khariar	ICPH 2671	4.4	5 (5F)	3.23	646	1.17	266
Sub-Total			18	24 (9F)	13.5	750	4.54	252
Rayagada	Rayagada	ICPH 2671	1	1	0.10	100	0.30	300
		ICPH 2740	2	1	0.30	150	0.70	350
	Kolnara	ICPH 2671	3	1	0.15	50	1.00	333
		ICPH 2740	0.5	1	0.20	400	0.25	500
	K.singhpur	ICPH 2671	1	1	0.30	300	0.50	500
		ICPH 2740	1	2	0.20	200	0.20	200
Sub-Total			8.5	7	1.05	124	2.95	347
Total			33	36 (9F)	15.76	478	8.58	260

4.3.4.2 Seed production of maintainer lines (AxB). The pilot of producing maintainer lines for farmer preferred hybrids was not so successful due to the tedious crop management required. Out of 8 ha sown only 3 tons was produced (Table 8).

Table 8. Seed production of maintainer lines (AxB) by district and block.

					A-Line		B-Line	
District	Block	Hybrid	Area (ha)	Farmer (No)	Total production (t)	Average yield (kg/ha)	Total production (t)	Average yield (kg/ha)
Kalahandi	Bhawanipatna	ICPH 2671	4	1	2.67	668	0.30	75
	Th. Rampur	ICPH 2740	4	1	0.08	20	0.13	33
Total			8	2	2.75	344	0.43	54

4.3.5. Seed reconstitution and multiplication at ICRISAT

For strengthening the seed system component of the project, ICRISAT continuously produces a total of 6,169 kgs of Nucleus/Breeder seeds of farmer preferred varieties and parental lines of hybrids to maintain its quality (Table 9).

Table 9. Summary of Breeder seed produced at ICRISAT.

Cultivar	Growth habit	Maturity duration	Type of seeds	Quantity (kg)
Variety				
ICPL 14002	Non-determinate	Medium	Breeder seeds	670
ICPL 14001	Non-determinate	Medium	Breeder seeds	155
ICP 7035	Non-determinate	Medium to long	Breeder seeds	1180
ICPL 20326	Non-determinate	Super early	Breeder seeds	8
ICPL 20338	Determinate	Super early	Breeder seeds	6
MN 1	Determinate	Early	Breeder seeds	7
MN 5	Determinate	Early	Breeder seeds	4
MN 8	Determinate	Early	Breeder seeds	4
ICPL 87091	Determinate	Early	Breeder seeds	55
ICPL 87	Determinate	Early	Breeder seeds	27
ICPL 151	Determinate	Early	Breeder seeds	20
ICPL 88039	Non-determinate	Early	Breeder seeds	1148
ICPL 161	Non-determinate	Early	Breeder seeds	1191
ICPL 81-3	Non-determinate	Early	Breeder seeds	43
ICPL 90048	Non-determinate	Early	Breeder seeds	24
ICPL 149	Non-determinate	Early	Breeder seeds	25
UPAS 120	Non-determinate	Early	Breeder seeds	33
PRG 176	Non-determinate	Early	Breeder seeds	209
Sub-total				4,809

continued

Table 9. Summary of Breeder seed produced at ICRISAT *continued*.

Cultivar	Growth habit	Maturity duration	Type of seeds	Quantity (kg)
A – Line				
ICPA 2043	Non-determinate	Medium	Parental line	150
ICPA 2047	Non-determinate	Medium	Parental line	200
ICPA 2048	Non-determinate	Medium	Parental line	5
ICPA 2092	Non-determinate	Medium	Parental line	150
Sub-total				505
B – Line				
ICPB 2043	Non-determinate	Medium	Parental line	200
ICPB 2047	Non-determinate	Medium	Parental line	400
ICPB 2048	Non-determinate	Medium	Parental line	5
ICPB 2092	Non-determinate	Medium	Parental line	60
Sub-total				665
R – Line				
ICPR 3762	Non-determinate	Medium	Restorer	120
Sub-total				120
Hybrids				
ICPH 2671	Non-determinate	Medium	Hybrid	20
ICPH 2740	Non-determinate	Medium	Hybrid	50
Sub-total				70
Total				6,169

4.3.6. Seed procurement for 2014-2015 cropping season

Establishing a seed system in the project has facilitated the purchase of good quality seeds apart from the benefit in income that accrues to the farmer seed growers. Each sample of the processed seeds drawn by OSSOPCA was submitted to Bargarh Seed Testing Laboratory (STL) for germination test, moisture percentage, purity percentage and percentage of insect damage. The total seeds of various seed class of varieties and hybrids procured by the project for the 2014-2015 cropping season was 78.1 tons to cover 10,025 ha with the following break-up: 1,984 kgs Foundation seeds (for Certified seed production) and 76.3 tons Certified seeds (for IPPT) (Table 10).

Table 10. 2014 Seed purchase for 2014-2015 cropping season.

Particulars	Cultivars	Area (ha)	Quantity (kg)	Spacing (cm)	Source of Seeds
Breeder to Foundation seed production	Asha	5	40	150x30	ICRISAT
	Maruti	50	400	150x30	
	ICP 7035	60	480	150x30	
	ICPL 88039	10	80	75x30	
	ICPL 87091	10	80	75x30	
	PRG 156	10	80	75x30	
	ICPL 161	2	30	75x30	
Sub-total		147	1,190		
Hybrid seed production (AxR)	ICPH 2671	20	160	150x30	ICPA 2043 + ICPR 2671 (ICRISAT)
	ICPH 2740	40	320	150x30	ICPA 2047 + ICPR 2740 (ICRISAT)
	ICPH 3762	5	40	150 x 30	ICPA 2092 + ICPL 20108
Sub-total		65	520		
Foundation to Certified seed production	Asha	23	184	150x30	Odisha project
	Maruti	100	800	150x30	
	ICP 7035	100	800	150x30	
	ICPL 88039	20	200	75x30	
Sub-total		243	1,984		
Certified seeds for IPPT	Asha	3,826	30,608	Monocrop (Medium – 150x30; Early – 75x30) and various intercropping system	Odisha project
	Maruti	3,666	29,328		
	Kamica	1,345	10,760		
	ICPL 161	7	70		
	ICPL 87091	2	20		
	ICPH 2671	320	1600		
	ICPH 2740	404	2,020		
Sub-total		9,570	74,406		
Total		10,025	78,100		

4.4. On-farm demonstration cum research

In addition to FPVST, an on-farm demonstration cum research for early pigeonpea and chickpea cultivars was conducted during the *Rabi* season (December 2013 to March 2014) in the rice-fallow areas. Roughly 1.3 million ha are under the rice-fallow cropping system located in the 30 districts of Odisha. About 75% of the cultivated areas are red soils and 25% black soils. This concept was demonstrated to look into the possibility of smallholder farmers attaining additional livelihood and income. Not only will the farmer get income but also this crop is important as a nitrogen fixing crop and its biomass that will rejuvenate the soil and add nutrient to the succeeding crop which is mainly rice.

4.4.1 Early duration cultivars of pigeonpea in the rice-fallow cropping system

The objective of this demonstration cum research activity is to showcase to farmers the ability of pigeonpea to utilize the available moisture present in the field after harvesting rice. However, the demonstration is only limited to areas were deep black soil is dominant because black soil has the ability to retain moisture longer (2-2.5 months) than red soil. A technology package was developed by ICRISAT which includes zero tillage and sowing through dibbling while maintaining appropriate row to row and plant to plant distance. ICRISAT has introduced 5 short duration varieties (ICPL 88039, MN-5, MN-1, MN-8, ICPL 20326) and results revealed that determinate varieties such as ICPL 20326, MN 1 and MN 8 performed better than the other varieties. The poor yield obtained (238 kg/ha from MN1) was the result of very late sowing during the period December to early January. However, in 2012 demonstration showed that ICPL 88039 sown in late October produced the highest yield of 924 kg/ha followed by Dharmagarh (729 kg/ha) and Bhawanipatna (370 kg/ha) with an average yield of 674 kg/ha. ICPL 88039 performed better in heavy black soil than in red soils (161 kg/ha) as shown in Table 11. However, this type of research will continue to search for the right variety and correct time of sowing to give hope to smallholder farmers improve their livelihood and income in the rice-fallow cropping system of Odisha.

Table 11. Status of ICPL 88039 in the rice-fallow cropping system of Kalahandi.

Block	Site (no.)	Farmers (no.)	Area sown (ha)	Area harvested (ha)	Average yield (kg/ha)	Soil type
Kesinga	19	19	10	4	161	Red soil
Bhawanipatna	5	5	8	3	370	Heavy black soil
Dharmagarh	2	2	2	2	729	Heavy black soil
Golamunda	5	5	1	1	924	Heavy black soil

4.4.2 Chickpea in the rice-fallow cropping system

Chickpea is sporadically grown in Odisha covering only 41,900 ha due to non-availability of high yielding varieties and technology inputs. Smallholder farmers are forced to save their own seeds year after year and/or purchase and exchange with fellow farmers. Farmers sow the seeds through broadcasting after land preparation during the late October or early November. During the initial demonstration, a technology package was introduced by ICRISAT which included zero tillage and sowing through dibbling while maintaining appropriate row to row and plant to plant distance. ICRISAT has introduced the ICCV 2 variety and results revealed that only 350 kg/ha was recorded because of late sowing (mid-late December) where soil moisture is already running dry and temperature is increasing. Therefore, the best time to sow chickpea is during the period October till mid-November where the temperature is at its lowest and water retention is at its highest.

4.5. Capacity building

The year 2013 saw an increasing participation of smallholder farmers in various capacity building activities especially with the involvement of women farmers (12.6%). A total 21,146 stakeholders

including 3,100 women (farmers, DA officers and technicians, NGOs, and ICRISAT staff members) attended various awareness meetings, seminar-workshops, trainings on crop seed production of hybrid and varieties, IPM/IDM, dal mill operation and maintenance, godown management, and international training and season-long courses (Table 12).

Table 12. Capacity building conducted and attended by various stakeholders.

Particular	District (no.)	Participant (no.)	Women (no.)	Stakeholders
Project Orientation and Planning Workshop	5	88	2	NGOs, ICRISAT Staff, Farmers and DA Officers and Technicians
Customized season-long training at ICRISAT (July 2013 - February 2014)	3	8	-	DCs, SC, NGO, Field attendants
Pigeonpea Seed Production and Management Training	3	506	46	Farmer seed growers; Technicians of Kalahandi, Rayagada, Nauparha; NGOs; ICRISAT staff
ICRISAT-ICAR International training course on high throughput phenotyping of chickpea and pigeonpea	2	3	-	ICRISAT staff and DoA Officer
Training cum field exposure on pigeonpea seed production	5	38	3	Field Attendants, DoA Officers and ICRISAT Staff
Farmers specialized training programs	5	696	51	Pigeonpea awareness, IPM/ IDM, cultural management
Intra-district exposure visit @ Rayagada	7	35	3	Farmers and Scientist of Angul, Dhenkanal (TL II), Farmers, Field Attendants, ICRISAT staff
Scientific visit @ ICRISAT	5	47	8	Farmers, DoA staff, RKVY Staff, ICRISA staff
Dal mill processing and maintenance training	4	85	42	SHGs of Rayagada, Nauparha, Kalahandi
Godown management training	5	70	6	Farmers, DDAs, NGOs, ICRISAT Staff,
Farmers awareness meetings	5	19,113	2,881	Farmer beneficiaries
Farmer's Field Day	4	457	58	Farmers (Kalahandi and Nauparha)
Total		21,146	3,100	

4.6. Literature, print and electronic media, and publication

4.6.1 Literature (booklets and pamphlets)

To complement awareness meetings, trainings, and seminar-workshops, the project distributed various farmer friendly publications in the Oriya language. A total of 5,000 smallholder farmers benefited from the booklets on cultural management practices of pigeonpea, and 7,000 benefited from booklets on integrated pest and disease management (Table 13). In addition, 10,000 copies of pamphlets featuring effective and efficient seed production system of pigeonpea varieties and hybrids were distributed to farmers during the seed distribution for the conduct of IPPT and seed production, apart from attendance during agro-trade fairs at districts Nauparha and Kalahandi. Likewise, during the trainings and field exposure visits, posters on hybrid and variety seed production and multiplication, pigeonpea and chickpea in the rice-fallow cropping system, and the importance of pigeonpea were distributed.

Table 13. Farmer friendly literatures in Oriya language.

Particular	Topic	Copy (no.)	Farmers (no.)
Booklet	Cultural Management Practices of Pigeonpea	5,000	5,000
Booklet	Integrated Pest and Disease Management	7,000	7,000
Pamphlet	Effective and efficient seed production system of pigeonpea varieties and hybrids	10,000	10,000
Total		22,000	22,000

4.6.2 Print and electronic media

An effective way to advocate project implementation among farmers in Odisha is through the local and national print media and through the use of local electronic media for wider circulation of project activities and benefits (Table 14). There are at least 7 local newspapers which showed an interest in writing about the project activities.

Table 14. Enhancing local-level awareness through print and electronic media.

Particulars	Location	Date	Topic
Radio	Kalahandi	22 Mar 2014	Production of Pigeonpea intercropping with cotton
Radio	Kalahandi	20 Aug 2013	Production technology and benefits of HYVs & hybrids of Arhar
Monthly News Magazine (Gram Swaraj Abhiyan)	Odisha	March 2014	Experience in doing pigeonpea cultivation with improved package of practices
Local Daily (Bhaskar) Kalahandi		10 Mar 2014	Planning workshop and godown cum office inauguration
Local Daily (Bhaskar)	Kalahandi	10 Mar 2014	New steps of introduction and expansion of pigeonpea farming in western Odisha
Local Daily (Dharitri)	Odisha	10 Feb 2014	Rayagada got best farmer award (2012-2013 cropping season) from President of India
Local Daily (Doordarshan)	Kalahandi	2 Dec 2013	Commercial cultivation of pigeonpea and value addition (dal mill)

continued

Table 14. Enhancing local-level awareness through print and electronic media *continued*.

Particulars	Location	Date	Topic
Local Daily (Samaj)	Nauparha	7 Oct 2013	Block level farmers training program (Khariar Block)
Local Daily (Dharitri)	Odisha	27 Sep 2013	IPM/IDM Training Program
Local Daily (Sambad)	Rayagada	26 Sep 2013	IPM/IDM Training Camp Held
Local Daily (The Samaya)	Odisha	3 Feb 2013	Benefit of Village Level Seed System of HYVs of pigeonpea
Local Daily (The Samaya)	Odisha	17 Feb 2013	Profit from pigeonpea seed production
ICRISAT Happenings	Andhra Pradesh	14 Mar 2014	Pigeonpea cultivation improving livelihoods of farmers in Odisha, India
ICRISAT Happenings	Andhra Pradesh	28 Feb 2014	Season-long training on pigeonpea seed production and management concludes
ICRISAT Happenings	Andhra Pradesh	14 Feb 2014	Farmer partner on pigeonpea seed production in Odisha, India receives top honor
ICRISAT Happenings	Andhra Pradesh	15 Nov 2013	Odisha smallholder farmer seed growers visit ICRISAT
ICRISAT Happenings	Andhra Pradesh	29 Mar 2013	ICRISAT participates in Odisha Agricultural Trade Fair
ICRISAT Happenings	Andhra Pradesh	25 Jan 2013	Dal machines turned over to Odisha partners

4.6.3 Publication

Important documents pertaining to the project milestones such as (i) 2012 Annual Report; (ii) ICRISAT-Odisha partnership flyers (iii) twelve success stories of smallholder farmers from Nauparha (6), Kalahandi (3) and Raygada (3) were published during 2013.

Table 15. Publications released in 2013.

Particulars	No. of copies	Title
2012 Annual Report	100	MG Mula and KB Saxena. 2013. Introduction and expansion of improved pigeonpea (Arhar) production technology in rainfed upland ecosystems of Odisha. Accomplishment report (June 2012-May 2013) and 2013 Physical Targets and 2013-2014 Revised Budget Proposals. ICRISAT Patancheru 502324, Andhra Pradesh India.
ICRISAT Success Stories	1,000	ICRISAT. 2013. Improved ICRISAT Pigeonpea Varieties and Hybrids for Odisha (English and Oriya version). Compiled by MG Mula, RV Kumar and KB Saxena. Patancheru 502324, Andhra Pradesh India.
Flyer	3,000	Mula MG, Saxena KB, Gopalan RS, Das SK and Kumar RV. 2013. Odisha and ICRISAT: Partnership for technological empowerment and sustainable livelihood for smallholder farmers in rainfed upland ecosystems of Odisha (English and Oriya version). ICRISAT, Patancheru 502324, Andhra Pradesh India.

4.7. Post-Harvest and processing facility

ICRISAT's strategy of adopting the inclusive market-oriented development (IMOD) by providing additional livelihood to farmers, NGOs and self-help groups (SHG), has benefited from the dal mill machines and spiral seed cleaner provided by the project. The operationalization of dal mills in Rayagada, Kalahandi and Nauparha introduced an inexpensive way of processing pigeonpea dal right at the doorstep of smallholder farmers in the area. In addition, the 25 metric ton godown in Rayagada and a 100 metric ton godown in Kalahandi have helped farmers store their seeds appropriately (Table 16).

Table 16. Processing and Post-harvest facility.

Particulars	Unit (no.)	Remarks
Dal Mill	3	Mini dal mill (including polisher, and generator) for Nauparha and Kalahandi
Godown	2	25 mt (Rayagada) and 100 mt (Kalahandi)
Spiral seed cleaner	3	Rayagada, Nauparha and Kalahandi

4.8. Appointment of district coordinator, field attendants and NGOs

To facilitate the smooth implementation of the project, a District Coordinator, three Field Attendants and two NGOs (Table 17) were deputed aside from continuously engaging the services of three local NGOs (SVA Nauparha, LOKSEBAK Kalahandi and Peoples Forum Bolangir). The hiring of Field Attendants and the engagement of NGOs was to backstop project implementation and provide assistance to the District Coordinator in the conduct of farmers' meetings and trainings, seed distribution and procurement aside from providing technical assistance.

Table 17. Names of personnel and NGOs engaged by the project.

Name	Designation	Date	Area
Mr Purna Singh	Dist. Coordinator	Oct 2013	Kalahandi
Ms Sanjeeta Panda	Field Attendant	Nov 2013	Bhawanipatna, Kalahandi
Mr Susil Kumar Pattnaik	Field Attendant	Nov 2013	Narla, Kalahandi
Mr Deelip K Bhoi	Field Attendant	Nov 2013	Boudh
Mr Pramod Pradhan (Center of Social Action and Tribal Development)	Secretary	May 2013	Rayagada
Mr Thabir Singh Dharua (Shramik Shakti Sangha)	President	May 2013	Bolangir

5. Awards and Recognitions

A monumental accomplishment of the project was the 'Krishi Karman Award for Progressive Farmers' bestowed on one of our project participants Mr Pradip Kumar Panda by the President of India Shri Pranab Mukherjee on pulses (pigeonpea). The award given on 10 February 2014 was the first for Odisha in pulses and particularly pigeonpea. Prior to this Mr Panda was also the recipient of the District and State 'Best Farmer Award on Pigeonpea' in March 2013. This award was in recognition of his involvement in 2011-2012 cropping season as a grower of ICRISAT line ICPL 14001.

6. A Momentum of Success

In its third year the project continues its momentum of success whereby production of pigeonpea has increased tremendously due to the interventions provided by ICRISAT through improved production practices and the adoption of high yielding varieties and hybrids. The involvement of partners (i.e. OSSOPCA, NGOs, private sector, DDAs, and SHGs) has strengthened and institutionalized the seed delivery system (a combination of formal and informal seed system) of smallholder farmers. This has generated various seed classes of high yielding varieties and hybrids from 130.9 t (2011); 491.6 t (2012) to 691 t in 2013. However, the strong commitment of the funding institution (Department of Agriculture and Food Production) through the leadership of its Director RS Gopalan has contributed to the project success.

7. Challenges for the Improvement of the Project

The 2013-2014 cropping season was a better year for pigeonpea stakeholders. Although some areas were affected by continuous rain, most smallholder farmers realized an increase in yield as compared to their usual local cultivars. The hiring of District Coordinator, Field Attendants and the engagement of NGOs has helped a lot in monitoring project activities. Table 18 presents the constraints and possible solutions for improving project implementation.

Table 18. Constraints in project implementation.

Constraints	Solution
Limitation of farmer seed growers to sell their various certified seeds at higher prices.	Dept. of Agriculture to take the lead in purchasing or linking the produce of farmer seed growers to market.
Abrupt drop of temperature (8-10°C) in December, which adversely affected the fertilization of pigeonpea flower and consequently the flowers dropped.	Introduction of early duration varieties (i.e. ICPL 88039, PRG 176, ICPL 161).
Pests during flowering and pod development stage.	Provision of pesticide in the seed production and IPPT. Dept. of Agriculture to provide subsidy scheme for fertilizer and pesticide to fully support the program. In seed production, the project will provide 50% of fertilizer and 50% of pesticides.
Non-compliance of the technology by other farmers.	Farmer selection must be made more stringent.
Non-certification of ICP 7035 by leading institution	Government of Odisha with assistance from Odisha University of Agriculture and Technology (OUAT) to release ICP 7035 as a state variety.
Seed procurement	Department of Agriculture should take the lead in ensuring the purchase of good quality seeds.

8. Financial Report

The project budget for 2013-2014 of Rs 27,146,000 and was fully utilized as shown in the attached utilization certificate and statement of accounts (Table 19).

ICRISAT
Science with a human face

International Crops Research Institute for the Semi-Arid Tropics

Dr R S Gopalan
Director of Agriculture and Food Production
Government of Odisha
Bhubaneswar – 751 001

6 February 2014

Dear Dr Gopalan,

Sub: Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology (IPPT) in Rainfed Upland Ecosystems of Odisha.

Please find attached the Utilisation Certificate (OGFR-19) for 1 April to 31 December 2013 for the above project.

Kindly arrange to remit the funds of Rs. 70,00,000 towards additional funds requested vide Dr Mula Myer email message of 21 January 2014, as per the bank details below.

Name of the Account	: ICRISAT
Account Number	: 908102000000037
Type of Account	: Current
Name of the Bank	: IDBI Bank, ICRISAT, Patancheru Hyderabad 502 324, A.P.
IFSC Code	: IBKL0000908
Branch Code	: 908
MICR Code	: 500259006

With regards,

Encl: a.a.

Yours sincerely,

Rajesh Agrawal
Assistant Director General
Finance

Copy: Drs Sameer Kumar / Myer G Mula / Ms. Joanna Kane-Potaka (ICRISAT)

Headquarters:
Patancheru 502 324
Andhra Pradesh, India
Tel +91 40 30713071
Fax (0) +91 40 3071 3074
+91 40 3071 3075
E-mail icrisat@cgiar.org

UTILISATION CERTIFICATE

(OGFR-19)

RASTRIYA KRUSHI VIKASH YOJANA (RKVY)

Sl.No.	Letter No. And Date	Amount Sanctioned
1	RTGS 22/05/2013	1,00,00,000
2	RTGS 30/08/2013	1,00,00,000
3	RTGS 05/12/2013	71,46,000
	Total	2,71,46,000

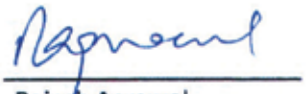
1. Certified that out of Rs. 2,71,46,000 (Rupees Two Crores Seventy One Lakhs Forty Six Thousand only) of grant in aid sanctioned during the year 2013-14 in favour of Director General, ICRISAT, Patancheru, AP by the Director of Agriculture & Food Production, Government of Odisha, Bhubaneswar under RKVY vide letter No. NIL, and a total amount of Rs. 2,11,67,704 (Rupees Two Crores Eleven Lakhs Sixty Seven Thousand Seven Hundred Four only) has been utilized during 1 April to 31 December 2013 and the receivable amount as of 31 December 2013 is Rs. 3,81,250 (Rupees Three Lakhs Eighty One Thousand Two Hundred Fifty only).

2. We have met the project targets on time.

3. Certified that I have satisfied that the condition on which the grant in aid was sanctioned have been duly fulfilled and that I have exercised the following checks to see that the money was actually spent for the purpose for which it was sanctioned.

Kinds of checks exercised:

1. The Financial management of the project has been done thru Financial Services, ICRISAT.
2. Procurements have been made thru centralized Purchase and Supplies Division, ICRISAT.
3. Expenditures have been verified and approved by the Project Manager.
4. ICRISAT maintains its accounting records as per CGIAR-Guidelines.

Signature- 

Rajesh Agrawal

Designation: Assistant Director General Finance

Date: 5 February 2014

(Seal)

Rajesh Agrawal
Assistant Director General
Finance

Table 19. Statement of Accounts

ICRISAT
Statement of Account
For the period April 1 to December 31, 2013 and cumulative to December 31, 2013

Project Title : **Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology (IPPT) in Rainfed Upland Ecosystems of Odisha**
Donor : **Agriculture Department, Government of Odisha**
Classification : **Restricted - Bilateral Project**
Currency : **USD**
Duration : **May 1, 2011 to April 30, 2015**

Item	Budget (Y1 to Y3) May 2011-Mar 2014		Expenditure Cumulative to March 31, 2013		Expenditure April 1 to December 31, 2013		Expenditure Cumulative to December 31, 2013		Balance as at December 31, 2013	
	INR	US$	INR	US$	INR	US$	INR	US$	INR	US$
A. Recurring										
1. Personnel	17,411,000	323,780	10,805,000	214,094	4,731,852	79,415	15,536,852	293,509	1,874,148	30,277
2. Production Program										
a. Seed Cost (IPPT)	14,850,000	284,950	13,354,679	257,540	1,495,321	27,410	14,850,000	284,950	-	-
b. Foundation Seed Production	2,145,000	40,110	1,045,000	19,814	1,100,000	20,296	2,145,000	40,110	-	-
c. Certified Seed Production	5,960,000	105,713	2,960,000	56,124	3,000,000	49,589	5,960,000	105,713	-	-
d. Hybrid Seed Production	420,000	7,351	120,000	2,220	300,000	5,131	420,000	7,351	-	-
e. Seed Certification	706,250	12,340	306,250	5,727	400,000	6,613	706,250	12,340	-	-
f. FPVT operations	2,280,000	43,258	1,516,792	30,641	763,208	12,617	2,280,000	43,258	-	-
g. NGO support	4,296,750	76,078	2,070,000	39,352	2,226,750	36,726	4,296,750	76,078	-	-
h. @ KVK (seed production)	2,450,000	53,541	1,200,000	32,895	1,250,000	20,646	2,450,000	53,541	-	-
i. @ ICRISAT (seed production)	2,840,000	58,721	4,170,130	91,631	627,782	(1,279)	4,797,912	90,352	(1,957,912)	(31,631)
3. Capacity Building (Trainings, Seminars, Workshops) and Publications	2,770,000	36,058	2,614,899	31,849	1,142,725	20,164	3,757,624	52,013	(987,624)	(15,955)
									-	-
4.Travel	1,970,000	40,537	1,864,172	37,577	453,915	8,583	2,318,087	46,160	(348,087)	(5,623)
5. Contingencies	900,000	16,819	500,000	10,002	400,000	6,817	900,000	16,819	-	-
Sub-Total	**58,999,000**	**1,099,262**	**42,526,922**	**829,466**	**17,891,553**	**292,728**	**60,418,475**	**1,122,194**	**(1,419,475)**	**(22,932)**
B. Non-recurring										
1. Equipment & accessories	4,131,000	77,293	2,502,687	50,517	969,705	16,136	3,472,392	66,653	658,608	10,640
Sub-Total	**4,131,000**	**77,293**	**2,502,687**	**50,517**	**969,705**	**16,136**	**3,472,392**	**66,653**	**658,608**	**10,640**
C. Institutional Overheads	9,470,000	183,111	6,783,937	132,539	2,306,446	44,439	9,090,383	176,978	379,617	6,133
Grand Total	**72,600,000**	**1,359,666**	**51,813,546**	**1,012,522**	**21,167,704**	**353,303**	**72,981,250**	**1,365,825**	**(381,250)**	**(6,159)**

Funds Status :

	INR	US$
Balance receivable as at April 1, 2013	**6,359,546**	**116,840**
Less Amount received during the period	27,146,000	463,984
Total funds available	**20,786,454**	**347,144**
Less Expenditure during the period	21,167,704	353,303
Balance receivable as at December 31, 2013	**381,250**	**6,159**

Notes

1. Total budget and line item classifications are as specified by the donor at project inception.
2. Currency conversions (INR/US$) are at average exchange rates as applicable.

Rajesh Agrawal
Assistant Director General
Finance

Section 2:
2014 Physical Targets

2014 Physical Targets

The 'Orientation, Planning Workshop' was conducted on March 4, 2014 at Bhawanipatna, Odisha for 70 project implementers of districts Kalahandi, Nauparha, Rayagada, Boudh and Bolangir. A total 9,570 hectares will be utilized for IPPT and 485 hectares will be utilized for seed production of Foundation, Certified and Hybrid seeds (Table 20). To sustain good quality seeds in the institutionalized seed system of the project, ICRISAT will continuously supply the Breeder seeds of farmer preferred varieties and Hybrid parental lines of ICPH 2671, ICPH 2740 and ICPH 3762.

a. Improved Pigeonpea Production Technology (IPPT)

A total quantity of 74.4 tons is required to cover 9,570 ha for the implementation of IPPT (Table 20). The produce of the farmer seed growers during the 2013-2014 cropping season will serve as the source of seeds.

b. Seed production

The project will continuously supply pure quality seeds to farmer seed growers in Odisha by enhancing and/or strengthening the seed delivery system of pigeonpea. Breeder, Foundation, and Certified seeds including Hybrid parental lines will be procured and will be reproduced by progressive farmer seed growers. A total 147 ha will be used to produce the Foundation seeds of farmer preferred varieties, while 243 ha will be used to produce the Certified seeds in addition to 65 ha requirement for the hybrid seed production (Table 20). The source of seeds for Foundation seeds will be from the produce of farmer seed growers.

Table 20. 2014 Seed requirement for IPPT and seed production.

Particulars	Cultivars	Area (ha)	Quantity (kg)	Spacing (cm)	Source of Seeds
Breeder to Foundation seed production	Asha	5	40	150x30	ICRISAT
	Maruti	50	400	150x30	
	ICP 7035	60	480	150x30	
	ICPL 88039	10	80	75x30	
	ICPL 87091	10	80	75x30	
	PRG 156	10	80	75x30	
	ICPL 161	2	30	75x30	
Sub-total		147	1,190		
Hybrid seed production (AxR)	ICPH 2671	20	160	150x30	ICPA 2043 + ICPR 2671 (ICRISAT)
	ICPH 2740	40	320	150x30	ICPA 2047 + ICPR 2740 (ICRISAT)
	ICPH 3762	5	40	150 x 30	ICPA 2092 + ICPL 20108
Sub-total		65	520		
Foundation to Certified seed production	Asha	23	184	150x30	Odisha project
	Maruti	100	800	150x30	
	ICP 7035	100	800	150x30	
	ICPL 88039	20	200	75x30	
Sub-total		243	1,984		

continued

Table 20. 2014 Seed requirement for IPPT and seed production *continued*.

Particulars	Cultivars	Area (ha)	Quantity (kg)	Spacing (cm)	Source of Seeds
Certified seeds for IPPT	Asha	3,826	30,608	Monocrop (Medium – 150x30; Early – 75x30) and various intercropping system	Odisha project
	Maruti	3,666	29,328		
	Kamica	1,345	10,760		
	ICPL 161	7	70		
	ICPL 87091	2	20		
	ICPH 2671	320	1600		
	ICPH 2740	404	2,020		
Sub-total		9,570	74,406		
Total		10,025	78,100		

c. Farmer Participatory Varietal Selection Trial (FPVST)

FPVST will continue to demonstrate the different high yielding cultivars in comparison with farmer's existing varieties. This year will include FPVST for early duration varieties aside from continuously testing the high yielding hybrids. A total 105 sites (35.5 ha) at 1 acre per site covering five districts will be utilized (Table 21 and 22).

Table 21. 2014 Conduct of Medium-duration FPVST by district.

	Kalahandi (20sites/8ha)		Nauparha (20sites/8ha)		Rayagada (20sites/8ha)		Bolangir (10sites/4ha)		Boudh (10sites/4ha)		Total (80sites/32ha)	
Cultivars	ha	kg	ha	kg	ha	kg	ha	kg	ha	kg	ha	kg
ICPH 3933	1.60	7.0	1.60	7.0	-	-	-	-	-	-	3.2	14
ICPH 2751	1.60	7.0	1.60	7.0	-	-	-	-	-		3.2	14
ICPL 20108	1.60	7.0	1.60	7.0	-	-	-	-	-	-	3.2	14
ICPH 2671	-	-	-	-	1.60	7.0	0.8	3.5	0.8	3.5	3.2	14
ICPH 2740	-	-	-	-	1.60	7.0	0.8	3.5	0.8	3.5	3.2	14
ICPH 3762	-	-	-	-	1.60	7.0	0.8	3.5	0.8	3.5	3.2	14
ICPL 14002	1.60	7.0	1.60	7.0	1.60	7.0	0.8	3.5	0.8	3.5	3.2	14
Local check	1.60	7.0	1.60	7.0	1.60	7.0	0.8	3.5	0.8	3.5	3.2	14
Total	8	35	8	35	8	35	8	35	8	35	25.6	112

Note: 1 FPVS trial site (1 acre = 4500 sqm)
4 hybrids + 1 local check
Required area per cultivar = 900 sqm/cultivar
Seed requirement = 0.35kg/cultivar

Table 22. 2014 Conduct of Early-duration FPVST by district.

	Kalahandi (5 sites/2ha)		Nauparha (5 sites/2ha)		Rayagada (5 sites/2ha)		Bolangir (5 sites/2ha)		Boudh (5 sites/2ha)		Total (25 sites/10ha)	
Cultivars	ha	kg	ha	kg	ha	kg	ha	kg	ha	kg	ha	kg
ICPL 161	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	1.65	8.75
ICPL 88039	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	1.65	8.75
PRG 176	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	1.65	8.75
ICPL 88034	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	1.65	8.75
ICPL 81-3	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	1.65	8.75
Local Check	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	0.33	1.75	1.65	8.75
Total	1.98	10.5	1.98	10.5	1.98	10.5	1.98	10.5	1.98	10.5	9.9	52.5

Note: 1 FPVS trial site (1 acre = 4500 sqm)
4 early duration varieties + 1 local check
Required area per cultivar = 750 sq.m.
Seed requirement = 0.35kg/cultivar

d. Processing and post-harvest facility

As part of value addition and empowering smallholder farmers through inclusive market-oriented development (IMOD), the project will continue to supply dal mills and build 25 mt godowns (Table 23).

Table 23. 2014 Processing and post-harvest facility.

Particulars	Unit (no.)	Remarks
Dal Mill	1	Mini dal mill (including polisher and generator)
Godown	1	25 mt
Spiral seed cleaner	1	

e. Schedule of activities prior to sowing

Table 24 presents the milestones prior to sowing of pigeonpea and trainings to be conducted.

Table 24. 2014 schedule of activities.

Activity	Schedule	Remarks
Procurement and Processing of Foundation, Certified and TL Seeds	February - April	Seeds procured from farmer seed growers
Processing of Breeder seeds	April	ICRISAT headquarters
Distribution of seeds (IPPT, Seed production and FPVT)	3rd week of May	ICRISAT (DCs, SC, Field Assistants, Dept. of Agriculture, and NGOs
Hiring of NGO (Nanpada)	April	ICRISAT
Capacity Building		
a. Conduct of project orientation and planning workshop cum Godown training for the 5 districts at Kalahandi	March	DDA, DOs, Field Assistants, Agricultural Technicians, NGOs, Seed company, DCs, and SC, OSSOPCA
b. Conduct of Farmer's Orientation meeting for the 5 districts	May-June	Distribution of seeds and fertilizers
c. Conduct of farmer seed growers orientation cum training	1st and/or 2nd week of June	4 districts
d. Customized Monthly training for Seed production @ specified project sites in 4 districts	July 2014 – February 2015	1 day per month training at project sites for NGOs, Field attendants and selected farmer seed growers
e. Conduct of IPM/IDM training	August - September	Farmer seed growers
Sowing	June 15	IPPT, Seed production, FPVT

Section 3:
Photo documentation

Improved Pigeonpea Production Technology (IPPT)

a. Seed Distribution

b. Seed Sowing

c. IPPT in Various Cropping System

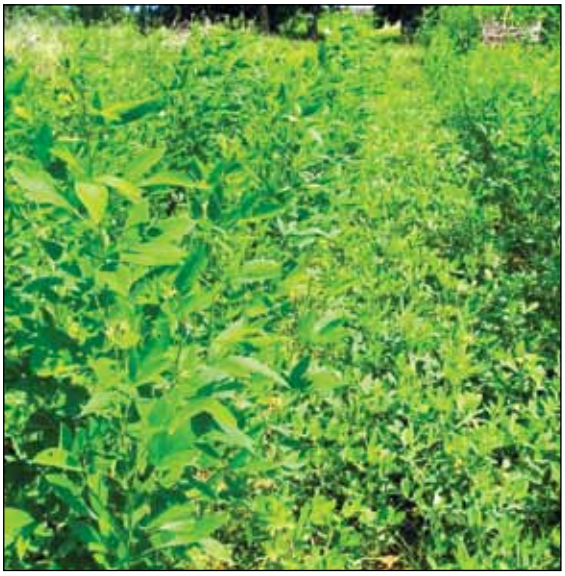
Cotton intercrop with pigeonpea.

Maize intercrop with pigeonpea.

Finger millet intercrop with pigeonpea.

Upland rice intercrop with pigeonpea.

Pigeonpea along fishponds.



Groundnut intercrop with pigeonpea.

Pigeonpea in rice bunds.

Pigeonpea along water reservoirs.

Pigeonpea in mountain slopes.

Pigeonpea in mango orchard.

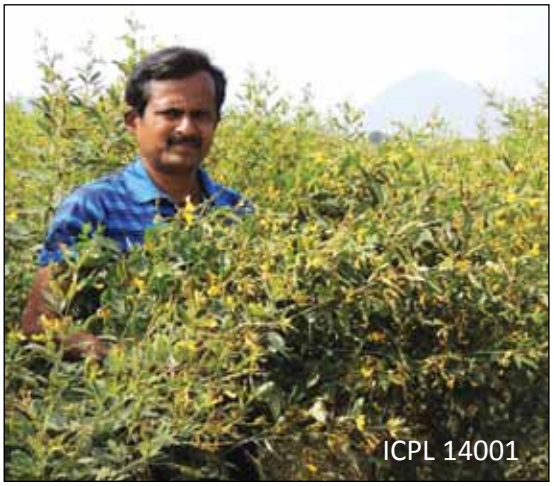
Pigeonpea as sole crop.

Farmer Participatory Varietal Selection Trial (FPVST)

Foundation, Certified and Hybrid Seed Production


ICP 7035


ICPL 14002


ICPL 14001


A x R


ICPL 88039

Harvesting and Threshing of Foundation, Certified and Hybrid Seeds

Seed Procurement and Processing

Seed Production and Processing of Breeder and Hybrid Seeds @ ICRISAT

Variety and Hybrid Seed Production and Seed Reconstitution @ ICRISAT

Capacity Building

a. Specialized Training for DoA Staff, NGOs and ICRISAT Personnel

b. Project Orientation Workshop

c. Farmers Specialized Training on Godown and Dal Mill Processing and Management

d. IPM and IDM Farmers Training

e. Farmer Seed Growers Training

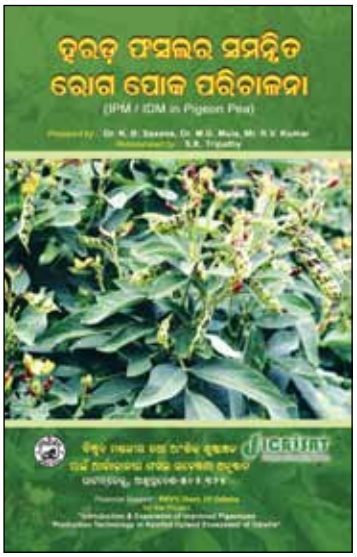
f. Farmers Awareness Meetings

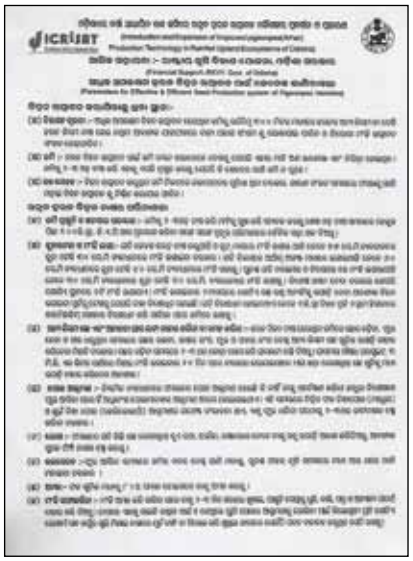
g. Farmer's Field Day

h. Attendance to the State and District Agricultural Trade Fair

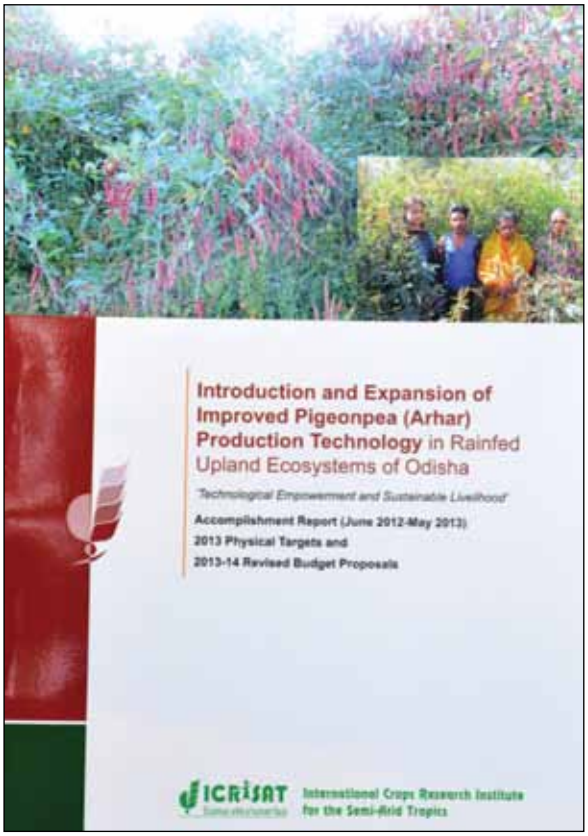
Farmer Friendly Literatures

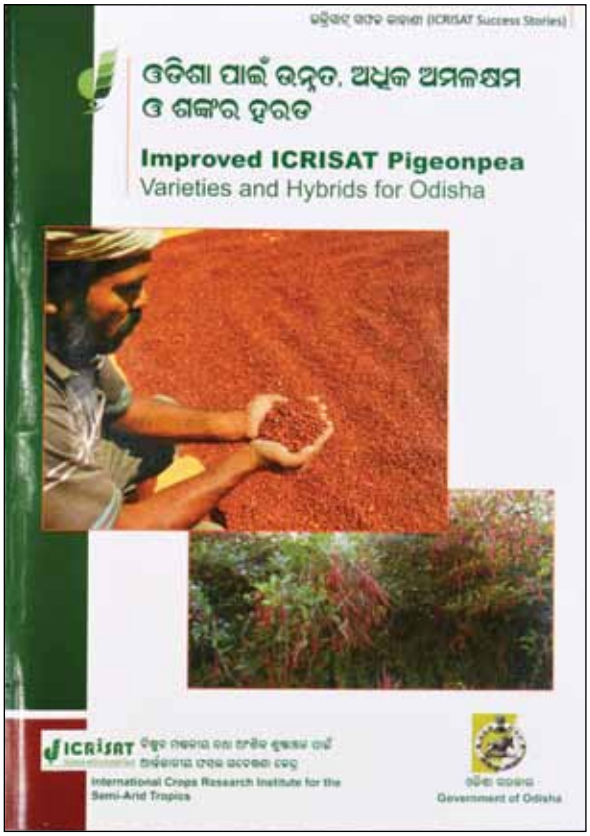
a. Booklets and Pamphlets





b. Publications



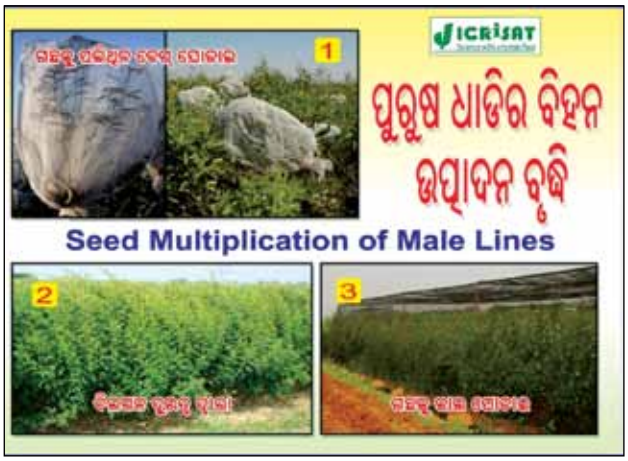


c. Posters


ହରଡ଼ ଚୁଷରେ ଲାଭ ଅନେକ
● ମରୁଡ଼ିର ଭୟ ରହିବ ନାହିଁ।
● ଜମିରେ ଯଥେଷ୍ଟାରଜାନ ସାର ବଢ଼ାଇବ।
● ଧାନ ଉଷ ଅପେକ୍ଷା ଅଧିକ ଆୟ।
● ଜାନେଣ୍ଡା ତଥା ଉତ୍କୃଷ୍ଟ ଖୋଖାଦ୍ୟ ବି ମିଳିବ, ଏଭଳି ଆହୁରି ଅନେକ ଲାଭ ଅଛି।
● ହରଡ଼ ସାଙ୍ଗକୁ ଅନ୍ତାଫସଲ (ଧାନ, ମୁଗ ଇତ୍ୟାଦି) ମଧ୍ୟ ମିଳିପାରିବ।
● ଖର୍ଚ୍ଚ କମ୍ ବିଲୁ ଲାଭ ଅଧିକ।
● ପରିବାର ପାଇଁ ସ୍ୱାଦିଷ୍ଟ ଓ ପୁଷ୍ଟିକର ଡାଲିର ଅଭାବ ରହିବ ନାହିଁ।
ଆମ ଅଞ୍ଚଳ ପାଇଁ ଉପଯୁକ୍ତ ଉନ୍ନତ ବିସମର ହରଡ଼ ବିହନ ପାଇଁ ଆଜି ହିଁ ନିକଟସ୍ଥ କୃଷି ବିଭାଗ ଅଧିକାରୀ ବିମା ସହକାରୀ ବିକାଶ ଅଧିକାରୀଙ୍କ ସହିତ ଯୋଗାଯୋଗ କରନ୍ତୁ।
ICRISAT


ICRISAT
ଜୀବିକା ବଜାୟ ରଖିବା ନିମନ୍ତେ ଧାନ ଚାଷ ପରେ ପଡ଼ିଆ ପଡ଼ୁଥିବା ଜମି ପାଇଁ ଫସଲ ପର୍ଯ୍ୟାୟରେ ହରଡ
Pigeonpea for Sustainable Livelihood in the Rice-Fallow Cropping System
MG Mula, KB Saxena, RV Kumar, SK Tripathy
Leaves
- Fodder
- Nutrition
Pod Wall
Seed Coat - Feed
Seeds - Food
Stem - Fuel
Fallen leaves - Soil
Roots
- Add 40 Kg N ha⁻¹
- 3m deep
- Releases P
- Recycle nutrients
ହରଡ ଗଛ
(The Pigeonpea Plant)
"Inclusive Market Oriented Development"
"Innovate, Grow & Prosper"


ହରଡ଼ ଚୁଷର ଉପକାରିତା
ମୃତ୍ତିକା ଉର୍ବରତା ଏବଂ ଫସଲ ବିବିଧିକରଣ
ପତ୍ରଖାଦ୍ୟ ଓ ଖାଦ୍ୟ
ଉତ୍ତମ ଖାଦ୍ୟ
ଜ୍ୱାଳେଣି
ICRISAT


ICRISAT
1
ପୁରୁଷ ଧାଡିର ବିହନ ଉତ୍ପାଦନ ବୃଦ୍ଧି
Seed Multiplication of Male Lines
2
3

News Articles

a. Local News Articles

కంది సాగులో ఉత్పాదకత పెంచుతాం

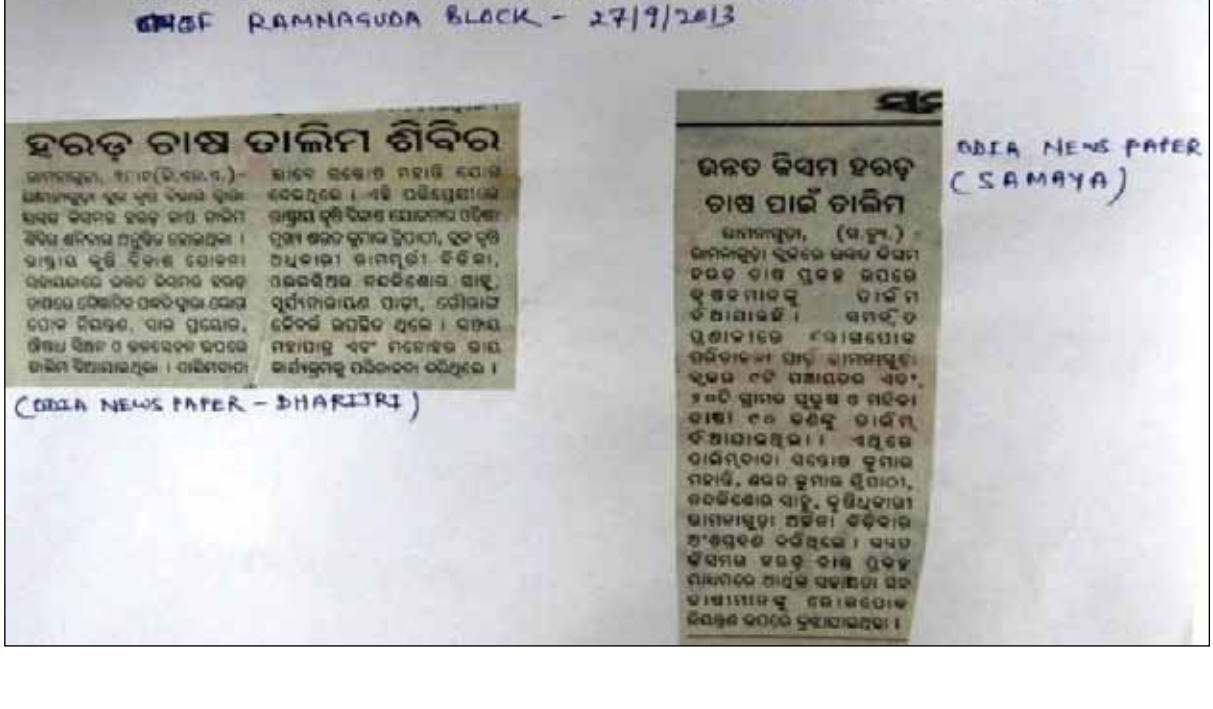
'మొరాకో'

కంది సాగు భేష్

ଓଡ଼ିଶା ଭାସ୍କର

ODISHA BHASKAR

ପଶ୍ଚିମ ଓଡ଼ିଶାରେ ହରଡ ଚାଷର ପ୍ରଚାରପ୍ରସାର ପାଇଁ ନୂଆ ପଦକ୍ଷେପ



NEWS PAPER PUBLICATION OF BRM/BDM TRAINING PROGRAMME HELD AT RAMNAGUDA BLOCK - 27/9/2013

ହରଡ଼ ଚାଷ ତାଲିମ ଶିବିର

(ODIA NEWS PAPER - DHARITRI)

ଉନ୍ନତ ବିସମ ହରଡ଼ ଚାଷ ପାଇଁ ତାଲିମ

(ODIA NEWS PAPER (SAMAYA)

ହରଡ଼ ଫସଲରେ ରୋଗପୋକ ପରିଚାଳନା ତାଲିମ ଶିବିର

ରୋଗପୋକ ପରିଚାଳନା ତାଲିମ

କୃଷକ କ୍ଷେତ୍ର ଦିବସ ପାଳିତ

THE SAMAYA

ହରଡ଼ ବିହନ ଉତ୍ପାଦନରେ ଲାଭ

(translated from Odia to English)

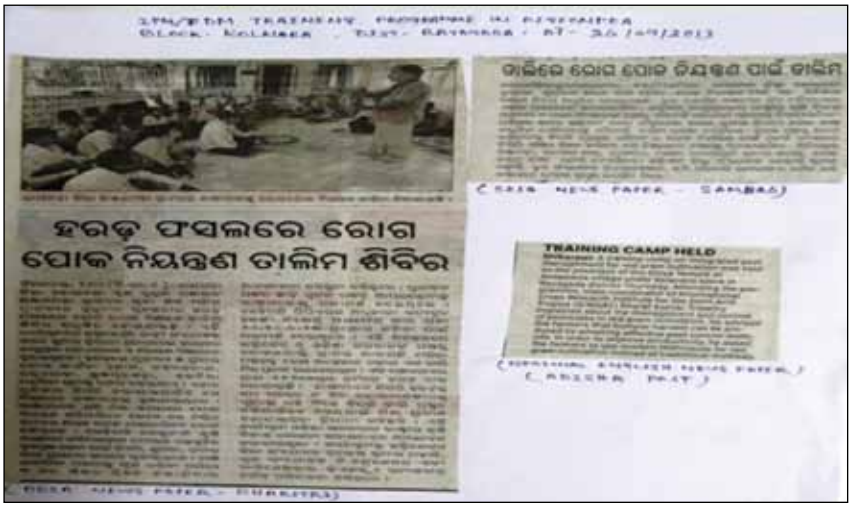
Profit from Pigeonpea Seed Production

ଧରିତ୍ରୀ ୨୧ ଫେବ୍ରୁଆରୀ ୨୦୧୪

ଜାତୀୟ-ଅନ୍ତର୍ଜାତୀୟ ୧୨

tion of Krishi Karman Awards 2012-13

Mr Pradeep Kumar Panda, a farmer from Kashana Block of Rayagada District, Odisha, got best farmer award (Pulse Chiranjeevi) from President of India. He had 35 acres of Maruti Foundation Seed production with adoption of improved best agronomical practices.



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ହରଡ଼ ଫସଲରେ ରୋଗ ପୋକ ନିୟନ୍ତ୍ରଣ ତାଲିମ ଶିବିର

TRAINING CAMP HELD

b. International News Articles (ICRISAT Happenings Newsletter)


ICRISAT Happenings
In-house Newsletter
International Crops Research Institute for the Semi-Arid Tropics

Dal machines turned over to Odisha partners


ICRISAT Happenings
In-house Newsletter

ICRISAT participates in Odisha Agricultural Trade Fair


ICRISAT Happenings
In-house Newsletter
14 February 2014
No. 1610

Farmer partner on pigeonpea seed production in Odisha, India receives top honor

Mr Pradip Kumar Panda, a progressive farmer cooperator under ICRISAT's "Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology in Rainfed Upland Ecosystems of Odisha" project was honored with the India Agriculture Minister's "Krishi Karman Award for Progressive Farmers" on 10 February.

Mr Panda received the award from the Honorable the President of India, Mr Pranab Mukherjee during the inaugural ceremony of the World Agroforestry Congress 2014 at Vigyan Bhavan in New Delhi. Mr Panda of Antamoda village, Rayagada district, Odisha owns 17 hectares of land on which he cultivates paddy, cotton, pigeonpea and maize.

This award was in recognition of his involvement in 2011-2012 cropping season as seed producer of ICRISAT line ICP 8863 (Maruti). He was also the recipient of the Odisha Best Farmer Award on Pigeonpea last March 2013. In 2013-2014 cropping season, he increased his area to 14 ha (some leased) to produce foundation seeds of Maruti. His field has been used as demonstration site for farmers from other districts, as well as for projects such as the Tropical Legumes II. ■

6 | ICRISAT HAPPENINGS | 14 FEBRUARY 2014 | 1610


ICRISAT Happenings
In-house Newsletter

Pigeonpea cultivation improving livelihoods of farmers in Odisha, India


ICRISAT Happenings
In-house Newsletter
28 February 2014
No. 1612

Season-long training on pigeonpea seed production and management concludes

As part of the institute's capacity building initiatives, seven technical staff from ICRISAT based in the state of Odisha, India and one representative of a non-governmental organization (Lokseba) were successfully trained in pigeonpea sowing, harvesting (seed to seed) and improved crop management techniques at the ICRISAT headquarters.

Under the project 'Introduction and Expansion of Improved Pigeonpea (Arhar) Production Technology in Rainfed Upland Ecosystem of Odisha', the participants took part in a two-day training session every month from July 2013 to February 2014.

The 'season-long training' followed the crop production cycle, and the participants' feedback was collected in monthly reports and presented to ICRISAT's Dr Myer G Mula, Training Coordinator and Principal Investigator of the project. Improved crop management was adopted during the production cycle.

Dr MG Mula inspecting pigeonpea crop along with the participants of the training program.

The trainees included: Sarat Kumar Tripathy (State Coordinator), Santosh Kumar Mohanty (Rayagada and Boudh District Coordinator), Yashobanta Naik (Naupada and Balangir District Coordinator), Purna Singh (Kalahandi District Coordinator), Raj Kishore Panda (Naupada Field Attendant), Tangudu Chandrasekhar (Rayagada Field Attendant), Hansaraj Bhoi (Kalahandi Field Attendant), and Ajit Prasad Mohanty (Loksebak). The activity was undertaken as part of the CGIAR Research Program on Grain Legumes. ■

Processing and Post Harvest Facility

a. Dal Mil Processing.

b. 25 MT Godown at Rayagada, Rayagada.

c. 100 MT Godown at Bhawanipatna, Kalahandi.

Project Monitoring

On-Farm Demonstration in the Rice-Fallow Cropping System

a. Pigeonpea

b. Chickpea

Conduct of Midterm Project Assessment