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CONTENTS

EDITORIAL

SCARDBs which are functional have generally improved their position last year as per the criteria for rating SCARDBs devised by NABARD. There has been significant improvement in recovery last year which is a critical factor in the rating system. Most of these banks have revamped recovery system based on best practices and suggestions made by Core Groups for Reform Initiatives constituted by SCARDBs under the guidance of the Federation.

The annual instalment system for repayment practised by SCARDBs since inception has been changed to monthly/quarterly demand in majority of loans. In fact, linking instalments only with the surplus generated in the project financed and the seasonality of such income is no longer necessary when major portion of borrower's income comes from other sources. Banks are also increasingly adopting flexible due dates when borrower's income stream has a seasonal pattern like in the case of tractor, harvesting machines etc which are meant mainly for custom hiring and some of the non farm sector units which do not function throughout the year. In such cases it makes sense to collect the yearly dues towards repayment in 6 or 8 monthly instalments in a year with a repayment holiday during off season.

Graduated instalment system for long duration loans, instead of equal/equated instalments, is another practice found to be useful in improving recovery. Graduated instalments facilitate recovering major portion of the loan during peak performing period of assets financed and to fix lower instalments in later years when yields slow down and cost of repairs and maintenance of assets increases.

Almost all SCARDBs operating through affiliated primary banks face the problem of carrying substantial volume of fictitious assets in their balance sheet in the form of loans receivable from primaries in excess of loans outstanding at the level of ultimate borrowers. When the primary is unable to fully meet its repayment obligation to the apex, a good part of its principal collection from borrowers is taken towards interest, leaving principal outstanding at the apex level higher than that at the ultimate borrower level.

There is no meaning in keeping such fictitious assets in the DCB and receivable account of the apex. These imaginary assets needs to be taken away to make its balance sheet as well as DCB realistic. Without blocking such assets, none of the SCARDBs can address the issue of overdues and NPAs even when primaries make 100% recovery at their level and remit the entire collections to the SCARDB. The imbalances blocked as above can be taken back to the balance sheet later on based on contributions by the PCARDBs concerned, out of their profit or should be written off by the SCARDB if it does not lead to losses.

There are also large number of loan accounts in which the borrower makes partial repayment every year. In most of these cases, amount remitted covers current year dues. But unpaid past dues make these accounts irregular. In agricultural term loans with 10-15 year repayment period, partial or full default in repayment once or twice is natural on account of natural calamities leading to crop loss or bulk expenses incurred by the borrower towards marriages, medical treatment etc which are not considered in the original calculation of his repaying capacity. The terms of loans should be flexible enough to accommodate such contingencies faced by the borrower with provision for phasing out unpaid dues pertaining to an abnormal year over the remaining period of loan and even by extending the period of loan to keep the repayment burden within his capacity to pay. This exercise involves case to case scrutiny of loans and realistic assessment of the present repaying capacity of the borrower. This will help the borrower to avoid penal charges which increases the chances of further default. Banks will also gain through stepping up asset quality in the process and avoiding the probability of these loans turning NPAs in the future.

ARDBs have also started strengthening pre due date recovery follow-up by sending timely demand notices and due date reminders through SMS and telephone calls. Post due date recovery follow-up is one area where ARDBs have been generally lagging behind. Post due date recovery follow-up consists of issuing a series of statutory notices as part of legal recovery procedure laid down in the Act and Rules. These notices are required to be sent one after another on expiry of the time limit mentioned in the previous one, without

breaking the chain for completing the legal recovery procedure. However, in majority of cases, the procedure does not progress beyond the first or second notice. The last stage of legal recovery process is sale of property through public auction. This happens only if dues are not cleared at any stage before that. The procedure culminates to sale only in rare cases since defaulters generally clear dues before that. But when the bank does not pursue the procedure after initial notices and repeat the same process every year during its intensive recovery drive period, such notices do not make any impact as nobody takes it seriously. The failure to complete post due date follow-up is attributed to shortage of staff in the PCARDBs and branches of SCARDBs. ARDBs in some States have started outsourcing the legal recovery follow-up through legal firms in their panel of legal advisors who are engaged for title acceptance.

In some areas ARDBs also face resistance to recovery through sale of security when defaulters dissuade people in the locality from participating in the auction for sale. When nobody comes forward to buy, the sale is confirmed in the name of ARDB. This apart from not serving the purpose in fact leads to complications in taking over possession and managing such properties putting substantial additional work load on staff. Recovery through sale of property is resorted as a last measure and as a deterrent against willful default. Since this becomes necessary only in rare cases, special efforts should be taken to ensure its success. In the first place, sale should be given statewide publicity through the network of SCARDB offices and PCARDBs in addition to newspaper advertisement. Banks should also identify potential buyers from other districts to participate in the auction who can also be offered a land purchase loan if necessary.

Strengthening the recovery machinery based on these best practices is an important challenge before SCARDBs to accelerate the momentum achieved last year in improving their position as per the rating system introduced by NABARD.

K. K. Ravindran
Managing Editor

Rural financial system in India and challenges before cooperative long term credit structure

K.K. Ravindran *

Introduction

India with 2.2% of the land area of earth is the home to 17% of world population. About 70% of its population of 1205 million still live in rural India. About 60% of rural population depend almost entirely on agriculture for livelihood in spite of rural sector being increasingly diversified. Agricultural growth, therefore, is central to India's efforts to improve the standard of living of rural population. Credit plays a crucial role in agricultural production and productivity.

Rural financial system in India- An overview

Enactment of Cooperative Societies Act in 1904 marked the beginning of a formal channel for agriculture and rural credit in India through cooperatives. The cooperative credit system, over the time evolved itself into separate streams for short term production credit and long term investment credit. Cooperatives were practically the only source of credit for farmers till 1969, when major commercial banks were brought under state ownership. However, cooperatives in spite of having a wide network could not meet the demand for rural credit in any significant measure due to paucity of resources. By 1971 only 30% of rural families had access to institutional credit of which 22% was the share of cooperatives and the balance by commercial banks and other agencies.

The period from 1969 to 1990 witnessed a number of policy initiatives by Govt for augmenting credit flow to rural sector.

- Entry of commercial banks in agricultural credit after nationalization through large scale branch expansion, district lead bank scheme for preparing and implementing district credit plans etc.
- Establishment of Regional Rural Banks in 1975 in predominantly unbanked districts under the joint ownership of Central Govt, State Govt and sponsoring commercial bank as a specialized agency for financing small/marginal farmers and weaker sections.
- Establishment of NABARD in 1982 for strengthening rural financial system with developmental, supervisory

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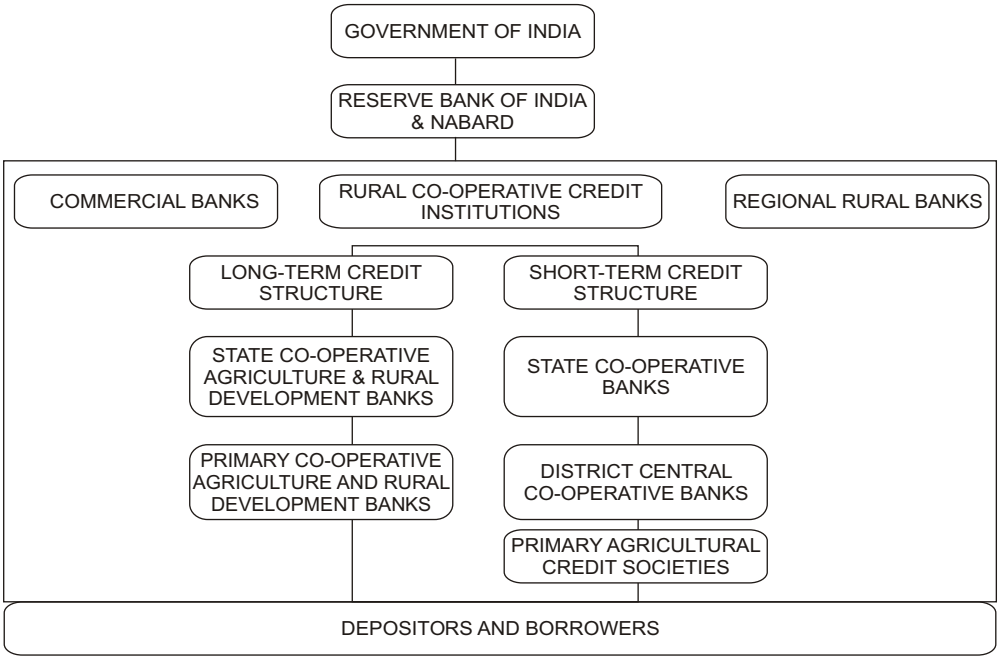
and refinancing role in agriculture. NABARD is also playing a major role in shaping the rural credit policies of the country.

- The SHG Bank linkage programme implemented under the leadership of NABARD which benefitted nearly 100 million families in the last two decades.
- Prescribing targets for priority sector advances by commercial banks with a sub target for agriculture.
- Introduction of Kisan Credit Card Scheme in 1989 as a single product for delivering credit for all needs of the farmer which drastically reduced transaction cost for banks and the borrower.

As a result of these initiatives, share of commercial banks in the total agricultural credit increased from 2.4% in 1971 to 35.2% in 1991. Financial sector reforms in India were initiated in 1990. State owned banks were recapitalized during this period. Focus was also shifted from social banking to financial soundness and efficiency of financial sector. Large number of rural branches of commercial banks which did not stand the test of viability were closed down during this period resulting in slow down in the growth of rural credit. The period also witnessed growth in the share of money lenders in agricultural credit from 17.5% in 1991 to 19.1% in 2001 for the first time since nationalization of banks. Since 2002 commercial banks and RRBs substantially stepped up agricultural credit resulting in doubling of credit in every 4 years thereafter.

- A package comprising of reforms and recapitalization of short term cooperative credit structure is under implementation since 2006 which has considerably strengthened the financial position and improved the performance of institutions in the short term cooperative credit structure.
- The Constitution of India was amended in February 2012 for including a chapter on cooperatives outlining the essential aspects of governance of cooperatives and its functioning as member driven autonomous and professionally managed enterprises. The constitutional provisions on cooperatives have become binding on States since February 2013 even without amending its own Acts. Constitutional amendment in respect of cooperatives is expected to speed up reforms in the rural cooperative credit system.

The structure of rural credit system in India is given in the following chart.



The relative share of cooperatives, RRBs and commercial banks in agricultural credit during 2007-08 to 2011-12.

(₹ in Billion)

	2007-08	2008-09	2009-10	2010-11	2011-12
Cooperatives	482.58	459.66	634.97	780.07	861.85
RRBs	253.12	267.65	352.17	442.93	542.39
Commercial Banks	1810.88	2289.51	2858.00	3458.77	3686.16
Other Agencies	--	2.26	--	1.14	--
Total	**2546.58**	**3019.08**	**3845.14**	**4682.91**	**5090.40**

Source: NABARD Annual Report 2011-12

Challenges and issues

The All India Rural Credit Survey Committee in 1954 observed that agricultural credit fell short of the right quantity, was not of the right type, did not serve the right purpose and failed to go to the right people. The above observation about agricultural credit in India continues to be relevant, even today to a great extent.

The share of cooperatives in the total credit flow has declined substantially affecting credit availability in interior rural areas especially for small and marginal farmers. India has 147.90 million rural households of which 89.35 million which is 60% of the total are farming households. Only half of them who are comparatively better off have access to formal credit system. Moreover, cooperatives with its present share of just about 17% of total volume of credit covers more than 60% of institutional borrowers most of whom are obviously not getting adequate quantity of credit. The resource base of cooperatives needs to be strengthened to improve credit availability to poorer sections of farmers.

There has been steady decrease in the proportion of investment credit in the total credit flow since 1990 resulting in declining capital formation and falling productivity. For instance, the per hectare yield of cereals in India has fallen from 2673 kg/hectare during 1998-2002 to 2537 kg/hectare during 2008-2012. The average yield is also significantly lower than in most other countries in the region as below.

Countries	Average yield of cereals in kg per hectare in 2012
Korea	6196
Japan	5852
China	5521
Vietnam	5161
Indonesia	4876
Bangladesh	4144
Philippines	3222
India	2537

Source: World Bank data on Agricultural Production

India needs accelerated farm investments facilitated by bank credit to raise agricultural productivity to the regional average.

Reforms and restructuring of cooperative rural credit structure is only half done. Revival package for short term cooperative credit structure has not been implemented in all States. Further, implementation of the package is not complete in most of the States where it was initiated. Similarly, revival package suggested for institutions in the long term credit structure remains a non starter.

Financing agriculture, especially under rain-fed conditions which accounts for 60% of the total area under cultivation involves high risk. At present, the entire risk involved in farm financing is borne by lending institutions resulting in high level of NPAs with them. For large number of institutions in the cooperative credit structure which cater mainly to small and marginal farmers, the NPAs are beyond tolerable level. Implementation of debt waiver schemes by Central and State Govts which benefitted only delinquent borrowers has further vitiated the climate of loan recovery.

Interest rates of short term agricultural loans are kept at affordable levels through subvention by Central Govt and even at nominal/zero level in a few States with additional subvention by State Govts. But in the absence of any such subvention by Central or State Govts, interest rates on investment credit is in the range of 13-14% p.a. which acts as a disincentive for farm investments.

Most part of the institutional credit goes to a few developed States in the south and northwest. Consequently, rural areas in eastern and north eastern States with huge potential for agricultural growth are not getting adequate credit. Addressing the skewed distribution of credit between various regions as well as between rural communities within each region is a major challenge for the rural financial system.

Challenges before long term rural cooperative credit system

Long term cooperative credit structure was created in the 1920s as a specialized agency for giving long term loans to farmers. In the beginning, farmers needed such loans for redemption of debt on land. Later on, long term loans were being increasingly used for capital formation in agriculture and rural sectors including non farm sector and housing.

The Cooperative Long Term Credit Structure was designed as non resource based lender depending entirely on borrowed funds. Complete dependence on external funds has considerably affected their ability to meet growing credit needs of members. Similarly, the structure is unable to supplement working capital or production credit to investment credit due to restrictions in their statutes as well as resource constraint. The structure also suffered substantial losses in implementing directed credit schemes of the govt in the 80s and 90s under a regime of regulated interest rates without adequate margins to meet their costs.

A Task Force appointed by the Central Govt recommended a revival package for the structure to compensate these losses and bring reforms to make the structure resource based institutions capable of meeting all kinds of credit needs of members. Even though the govt accepted these recommendations in principle, its implementation is still pending.

In the meantime, the structure has taken certain initiatives especially in bringing down NPAs and raising resources through member deposits and diversifying avenues for borrowings with varying levels of success in different States. The future of the structure depends on the success of these initiatives everywhere and the implementation of the proposed package comprising of recapitalization and reforms without further delay.

Conclusion

Expansion of agricultural credit in India in the last 20 years was facilitated mostly by commercial banks. However, commercial banks' credit support has a bias in favour of comparatively well off sections of farmers and other communities, as evidenced from the average size of agricultural loans given by commercial banks which is six times more than that of cooperatives. Because of this, even when overall credit expansion takes place at a rapid pace and meets the quantitative targets, there has not been desired reduction in the number of rural families outside the fold of formal credit system. Addressing this problem through qualitative change in the structure and distribution of credit between regions and sections of rural committees is the main challenge before rural financial system in India. Strengthening of rural cooperative credit structure occupies high priority in meeting this challenge.

बटन मशरूम

भारत जैसे देश में जहाँ की अधिकांश आबादी शाकाहारी है, खुम्बी का महत्व पोषण की दृष्टि से बहुत अधिक है । यहां मशरूम का प्रयोग सब्जी के रूप में किया जाता है। भारत में खुम्बी उत्पादकों के दो समूह हैं, एक जो केवल मौसम में ही इसकी खेती करते हैं तथा दूसरे जो सारे साल मशरूम उगाते हैं। मौसमी खेती मुख्यत: हिमाचल प्रदेश, जम्मू–काश्मीर, उत्तराखण्ड, उत्तर–पश्चिमी पहाड़ी क्षेत्रों, तमिलनाडु के पहाड़ी भागों में 2–3 फसलों के लिए तथा उत्तर पश्चिमी समतल क्षेत्रो में केवल जाड़े की फसल के रूप में की जाती है। पूरे साल खुम्बी की खेती सारे देश में की जाती है। चंडीगढ, देहरादून, गुड़गॉव, ऊटी, पूना, चेन्नई तथा गोवा के आसपास 200 से 5000 टन प्रतिवर्ष खुम्बी उगाने वाली निर्यातोन्मुखी इकाईयां लगी हुई हैं।

व्यावसायिक रूप से तीन प्रकार की खुम्बी उगाई जाती है। बटन (Button) खुम्बी, ढींगरी (Oyster) खुम्बी तथा धानपुआल या पैडीस्ट्रा (Paddy straw) खुम्बी। इन में बटन खुम्बी सबसे ज्यादा लोकप्रिय है। तीनों प्रकार की खुम्बी को किसी भी हवादार कमरे या शेड में आसानी से उगाया जा सकता है।

बटन मशरूम उगाने का सही समय

भारत में बटन मशरूम उगाने का उपयुक्त समय अक्तुबर से मार्च के महीने हैं। इन छह महीनों में दो फसलें उगाई जाती हैं। बटन खुम्बी की फसल के लिए आरम्भ में 22 से 26 डिग्री सेंटीग्रेड तापमान की आवश्यकता होती है, इस तापमान पर कवक जाल बहुत तेजी से बढता है। बाद में इसके लिए 14 से 18 डिग्री तापमान ही उपयुक्त रहता है। इस से कम तापमान पर फलनकाय की बढ़वार बहुत धीमी हो जाती है। 18 डिग्री से अधिक तापमान भी खुम्बी के लिए हानिकारक होता है।

बटन मशरूम उगाने के लिए कम्पोस्ट बनाना तथा उसे पेटीयों या थैलियों में भरना

बटन मशरूम की खेती के लिए विशेष विधि से तैयार की गई कम्पोस्ट खाद की आवश्याकता होती है। कम्पोस्ट साधारण विधि (Simple method) अथवा निर्जीविकरण विधि (Pasturization method) से बनाया जाता है। कम्पोस्ट तैयार होने के बाद लकडी की पेटी या रैक में इसकी 6 से 8 इंच मोटी परत या तह बिछा देते हैं। यदि बटन खुम्बी की खेती पोलिथिन की थैलियों में करनी हो तो कम्पोस्ट खाद को बीजाई या स्पानिंग के बाद ही थैलियों में भरें। थैलियों में 2 मिलीमीटर व्यास के छेद थोड़ी–थोड़ी दूरी पर कर दें।

बटन मशरूम बीजाई या स्पानिंग

मशरूम के बीज को स्पा्न कहतें हैं। बीज की गुणवत्ता का उत्पादन पर बहुत असर होता है, अत: खुम्बी का बीज या स्पान अच्छी भरोसेमंद दुकान से ही लेना चाहिए। बीज एक माह से अधिक पुराना भी नहीं होना चाहिए। बीज की मात्रा कम्पोस्ट खाद के वजन के 2-2.5 प्रतिशत के बराबर लें।

बीज को पेटी में भरी कम्पोस्ट पर बिखेर दें तथा उस पर 2 से 3 सेमी मोटी कम्पोस्ट की एक परत और चढा दें। अथवा पहले पेटी में

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कम्पोस्ट की 3 इचं मोटी परत लगाऐं और उसपर बीज की आधी मात्रा बिखेर दे। तत्पश्चात उस पर फिर से 3 इंच मोटी कम्पोस्ट की परत बिछा दें और बाकी बचे बीज उस पर बिखेर दें । इस पर कम्पोस्ट की एक पतली परत और बिछा दें।

बीजाई के बाद मशरूम की देखभाल

कवक जाल का बनना – बीजाई के पश्चात पेटी अथवा थैलियों को खुम्बी कक्ष में रख दें तथा इन पर पुराने अखबार बिछाकर पानी से भिगो दें। कमरे में पर्याप्त नमी बनाने के लिए कमरे के फर्श व दीवारों पर भी पानी छिडकें। इस समय कमरे का तापमान 22 से 26 डिग्री सेंन्टीग्रेड तथा नमी 80 से 85 प्रतिशत के बीच होनी चाहिए। अगले 15 से 20 दिनों में खुम्बी का कवक जाल पूरी तरह से कम्पोस्ट में फैल जाएगा। इन दिनों में खुम्बी को ताजा हवा नहीं चाहिए अतरू कमरे को बंद ही रखें।

परत चढाना या केसिंग करना – गोबर की सड़ी हुई खाद एवं बाग की मिट्टी की बराबर मात्रा को छानकर अच्छी तरह से मिला लें। इस मिश्रण का 5 प्रतिशत फार्मलीन या भाप से निर्जीवीकरण कर लें। इस मिट्टी को परत चढाने के लिए प्रयोग करें। कम्पोस्ट में जब कवक जाल पूरी तरह से फैल जाए तो इसके उपर उपरोक्त विधि से तैयार की गई मिट्टी की 4–5 सेमी मोटी परत बिछा दें। परत चढानें के 3 दिन बाद से कमरे का तापमान 14–18 डिग्री सेंटीग्रेड के बीच व आद्रता 80–85 प्रतिशत के बीच स्थिर रखें। यह समय फलनकाय बनने का होता है । इस समय बढवार के लिए ताजी हवा और प्रकाश की जरूरत होती है। इसलिए अब कमरे की खिडकियाँ व रोशनदान खोलकर रखें।

खुम्बी फलनकाय का बनना तथा उनकी तुड़वाई – खुम्बी की बीजाई के 35–40 दिन बाद या मिट्टी चढानें के 15–20 दिन बाद कम्पोस्ट के उपर मशरूम के सफेद फलनकाय दिखाई देने लगते हैं जो अगले चार–पॉच दिनों में बटन के आकार में बढ जाते हैं। जब खुम्बी की टोपी कसी हुई अवस्था में हो तथा उसके नीचे की झिल्ली साबुत हो तब खुम्बी को हाथ की उंगलियों से हल्का दबाकर और घुमाकर तोड लेते हैं। कम्पो्स्ट की सतह से खुम्बी को चाकू से काटकर भी निकाला जा सकता है। सामान्यतत्वा एक फसलचक्र (6 से 8 सप्ताह) में खुम्बी के 5–6 फल आते हैं।

मशरूम की पैदावार तथा भंडारण – सामान्यतहा 8 से 9 किलोग्राम खुम्बी प्रतिवर्ग मीटर में पैदा होती है। 100 किलोग्राम कम्पोस्ट से लगभग 12 किलोग्राम खुम्बी आसानी से प्राप्त होती है। खुम्बी तोडने के बाद साफ पानी में अच्छी तरह से धोयें तथा बाद मे 25 से 30 मिनट के लिए उनको ठंडे पानी में भीगो दें। खुम्बी को ताजा ही प्रयोग करना श्रेष्ठ होता है परन्तु फ्रिज में 5 डिग्री ताप पर 4–5 दिनों के लिए इनका भंडारण भी किया जा सकता है।

स्थानीय बिक्री के लिए पोलिथिन की थैलियों का प्रयोग किया जाता है। ज्यादा सफेद मशरूम की मांग अधिक होने के कारण ताजा बिकने वाली अधिकांश खुम्बीयों को पोटेशियम मेटाबाइसल्फेट के घोल में उपचारित किया जाता है।

मशरूम की खेती में सावधानी – मशरूम का उत्पादन अच्छी कम्पोस्ट खाद तथा अच्छे बीज पर निर्भर करता है अतः कम्पोस्ट बनाते समय विशेष सावधानी बरतनी चाहिए । कुछ भूल चूक होने पर अथवा कीडा या बीमारी होने पर खुम्बी की फसल पूर्णतया या आंशिक रूप से खराब हो सकती है।

बटन मशरूम उगाने के लिए कम्पोस्ट खाद बनाने की तकनीक

बटन मशरूम की खेती एक विशेष विधि से तैयार की गई कम्पोस्ट खाद पर की जाती है। इस कम्पोस्ट को साधारण अथवा निर्जीवीकरण विधियों से बनाया जाता है।

साधारण विधि से कम्पोस्ट बनाने की तकनीक – साधारण विधि से कम्पोस्ट बनाने में 20 से 25 दिन का समय लगता है। 100 सेंमी लम्बी, 50 सेंमी चौड़ी तथा 15 सेंमी ऊँची 15 पेटियों के लिए इस विधि से कम्पोस्ट बनाने के लिए सामग्री :

1. धान या गेहूं का 10–12 सेंमी लम्बाई में कटा हुआ भूसा – 250 किलोग्राम
2. धान या गेहूं की भूसी – 20–25 किलोग्राम
3. अमोनियम सल्फेट या कैल्शियम अमोनियम नाईट्रेट – 4 किलोग्राम
4. यूरिया – 3 किलोग्राम
5. जिप्सम – 20 किलोग्राम
6. मैलाथियॉन – 10 किलोग्राम

जिस स्थान पर कम्पोस्ट तैयार करनी हो वहां पर गेहूं के भूसे की 8 से 10 इंच मोटी तह बिछाकर उसे पानी से अच्छी तरह से भिगो दें। पानी में भिगोने के लगभग 16 से 18 घंटे बाद उसमें जिप्सम तथा कीटनाशक को छोडकर बाकी सभी सामग्री अच्छी तरह से मिला दें। फिर उस सारी सामग्री का एक मीटर चौडा, एक मीटर ऊचा तथा समायोजित लम्बाई का ढेर बना दें। इस ढेर को प्रत्येक 3–4 दिन के अन्तराल पर हवा लगाने के लिए फर्श पर खोलकर बिछा दें तथा आधा घंटे बाद दोबारा उसी आकार का ढेर बना दें। अगर भूसा सूखा लगे तो उस पर हल्का पानी छिडककर गीला कर लें। तीसरी पलटाई के दौरान कुल जिप्सम की आधी मात्रा मिला दें। शेष बचे जिप्सम को चौथी पलटाई के दौरान भूसे में मिला दें। पॉचवी पलटाई के दौरान 10 मिलि लिटर मैलाथियान को 5 लीटर पानी में घोलकर भूसे पर छिडकाव करें तथा अच्छी तरह से मिलाकर फिर से ढेर बना दें। अगले 3 से 4 दिनों में कम्पोस्ट खाद पेटियों में भरने योग्य हो जायेगा।

निर्जीविकरण विधि से कम्पोस्ट बनाने की तकनीक (Pasturization method of making compost for mushroom)

मशरूम का उत्पादन अच्छी कम्पोस्ट खाद पर निर्भर करता है अतः कम्पोस्ट बनाते समय विशेष सावधानी बरतनी चाहिए। निर्जीविकरण विधि से कम्पोस्ट खाद दो चरणों में लगभग 14–15 दिनों में तैयार होती है।

पहला चरण – इस विधि से कम्पोस्ट बनाने का पहला चरण साधारण विधि के समान ही है परन्तू इसमें पलटाई हर दूसरे दिन यानि लगभग 48 घंटे के बाद की जाती है तीसरी पलटाई में जिप्सम मिला दिया जाता है। 8 दिन बाद कम्पोस्ट दूसरे चरण के लिए तैयार हो जाती है।

दूसरा चरण – दूसरे चरण में कम्पोस्ट को सीधे ही या फिर पेटीयों में भरकर भाप द्वारा पहले से 45 डिग्री ताप पर गर्म किये हुए निर्जीविकरण कक्ष में रखते हैं। इसके बाद इस कक्ष की सभी खिडकीयॉ दरवाजें बंद कर दें तथा अगले 2–3 दिनों तक भाप से अन्दर का तापमान 57–58 डिग्री पर बनाएं रखें ।

तीसरे दिन 2 घंटे के लिए इस कक्ष का ताप 60 से 62 डिग्री पर स्थिर करें तत्पश्चात कक्ष में ताजी हवा का प्रवाह बनाऐं तथा तापमान को धीरे–धीरे गिरकर 45 डिग्री तक आने दें। अगले 3–4 दिनों तक कम्पोस्ट को सामान्य ताप तक ठंडा होने दें। सामान्यत ताप पर आने पर कम्पोस्ट भरने के लिए तैयार हो जाती है। तैयार कम्पोस्ट गहरे भूरे रंग की तथा गंध रहीत होती है तथा इसका PH लगभग उदासीन होता है।

Persistence of informal credit in rural india: Evidence from 'All-India Debt and Investment Survey' (RBI working paper series 5 / 2013)

Narayan Chandra Pradhan*

The Reserve Bank of India introduced the RBI Working Papers series in March 2011. These papers present research in progress of the staff members of the Reserve Bank and are disseminated to elicit comments and further debate. The views expressed in these papers are those of authors and not those of the Reserve Bank of India. Comments and observations may kindly be forwarded to authors. Citation and use of such papers should take into account its provisional character.

The Reserve Bank placed on its website a Working Paper titled "Persistence of Informal Credit in Rural India: Evidence from 'All-India Debt and Investment Survey' and Beyond" under the RBI Working Paper Series. The paper has been authored by Dr. Narayan Chandra Pradhan, Assistant Adviser in the Department of Economic and Policy Research (DEPR) of Reserve Bank of India.

Rural credit markets in India is characterised by the coexistence of both formal and informal sources of finance and the market is fragmented. To discuss the informal rural credit issue and to maintain consistency with All India Debt and Investment Survey (AIDIS) data, this paper treats credit supplied by non-institutional agencies as informal while institutional agencies as formal sources of credit. It covers both 'All-India Rural Credit Survey 1951-52' (RBI, 1954) and 'All-India Rural Debt and Investment Survey 1961-62' (RBI, 1965) conducted by the Reserve Bank and four rounds of All-India Debt and Investment Surveys by 'National Sample Survey Organisation' (NSSO) of the Government of India from 1971-72 to 2002-03. In the absence of further survey data, to extend discussion on rural credit scenario including 'Micro Finance Institutions' (MFIs) beyond 2002, the paper has heavily drawn upon four recent official Reports: (i) Report of the Technical Group to Review Legislations on Money Lending (RBI, 2006), (ii) Report of the Task Force on Credit Related Issues of Farmers (GOI, 2010), (iii) 'Malegam Committee Report' (RBI, 2011), and (iv) Micro Finance Institutions (Development and Regulation) Bill, 2012 (introduced in Parliament on May 16, 2012). It is assessed that the share of rural informal credit in total outstanding debt has been certainly decreasing

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over the period from 1950 to 2002 with various financial inclusion initiatives of the Reserve Bank and legislations of the various state governments to regulate money-lenders. However, about two-fifth of the rural households' dependence on informal credit, even today, indicates further scope for financial inclusion in rural areas. This augurs well for new financial sector initiatives in the form of prompt and innovative policy responses to prioritise financial inclusion, financial education as well as financial literacy.

The paper makes an attempt to assess the share of rural informal credit in total outstanding debt which has been decreasing over the period from 1950 to 2002 with various financial inclusion initiatives of the Reserve Bank and legislations of the various State Governments to regulate money-lenders. However, about two-fifth of the rural households' dependence on informal credit indicates further scope for financial inclusion in rural areas.

Major findings of the paper are:

- The share of institutional credit agencies in the outstanding cash dues of the rural households at the all-India level increased from 29% in 1971 to 61% in 1981; the pace of increase was arrested subsequently to 64% in 1991. During 1990s, the share declined and reached 57% in 2002.
- The period of distress in agriculture in the 2000s is also identified with a relatively declining contribution of cooperatives in agricultural credit, and with RRBs not showing substantial increase in agricultural credit, indicating the urgent need to ensure increased access to agricultural credit for small and marginal farmers.
- Rural borrowers prefer to use informal sources of credit despite the fact that they charge much higher interest rates. This is perhaps because informal sources do not insist on regular repayment as banks or cooperative credit societies do. Usually, it is possible to obtain loans for such purposes as marriage and attending to litigation only from informal sources and without collaterals.
- There is a need for regulatory policies to recognise the changing rural landscape, adapt to new realities and bring in suitable changes as many of the informal players are not included in the existing regulatory framework on money lending.

This calls for financial sector initiatives in the form of prompt and innovative policy responses to prioritise financial inclusion, financial education as well as financial literacy. The complete paper can be viewed on http://www.rbi.org.in/scripts/PublicationsView.aspx?id=14986.

The selected paragraphs from the paper for the readers of the Land Bank Journal are published here. It may be noted that this is not a complete paper.

I. Introduction

Before the First Plan began in 1951, almost all the financial needs of rural sector vis-à-vis agriculture were provided by the moneylenders. At that time, the Reserve Bank was very active in pursuing cooperative movements through a variety of initiatives. Despite all those efforts, the provision of credit through cooperatives and commercial banks were to the extent of about 4% of the total outstanding debt as at end-June 1951. This finding of Report of the All India Rural Credit survey (RBI, 1954), AIRCS henceforth, had laid the foundation stone for furthering the role of institutional credit to rural sector through formal channel of cooperatives and commercial banks. The AIRCS1 stated, Cooperation has failed, but Cooperation must succeed and recommended for credit delivery through institutional channel (throughout this paper, formal and institutional as well as informal and non-institutional are used interchangeably) in the areas of agriculture marketing, processing, storage and warehousing. The subsequent formation of 'Agricultural Refinance Corporation' in 1963, nationalisation of major commercial banks in 1969 and 1980 in second phase, setting up of Regional Rural Banks in 1975, and formation of National Bank for Agriculture and Rural Development (NABARD) in 1982 - all these efforts by the Reserve Bank were to institutionalise the credit channel for rural sector. In the 1990s and 2000s, the concept of micro-credit along with MFI- and SHG-Bank linkage models have evolved with the institutional support of the Reserve Bank and NABARD in order to help the poor in providing credit without collaterals (for a succinct description of rural credit scenario in recent years, one may refer to: Mohan, 2004; Reddy, 2006; Golait, 2007).

In recent years, the excessive reliance of borrowers on some or other forms of moneylender and informal/semi-formal sources and exorbitant interest rate charged by those entities have captured the attention of policy makers to downsize the informal sector finance. The Technical Group Report to review legislations on money lending (RBI, 2006) by the Reserve Bank had examined, inter alia, the functioning of moneylenders, linkages between money lending activities and formal credit channels, international practices in regulating money lending activities, and enforcement machinery for money lending and similar activities in the interest of rural households. The Report of the 'Task Force on Credit Related Issues of Farmers' (GOI, 2010) submitted to the Ministry of Agriculture in June 2010 had looked into the issue of a large number of farmers, who had taken loans from private moneylenders (and not covered under the loan waiver scheme). The report has mentioned: In recent years, policy

interventions have led to doubling of agricultural credit, but the limited access of small and marginal farmers to institutional credit continues to be a matter of concern. What is worrying is that the proportion of such farmers is increasing and they form more than four-fifths of the operational holdings".

II. All India Debt and Investment Survey

(a) Surveys by the Reserve Bank

In order to study both the demand and supply sides of credit in the household sector, the Reserve Bank had conducted the 'All-India Rural Credit Survey' in 1951-52 and a result of the Survey was published in 1954. Information on assets, economic activities, particulars of credit operations and the incidence of indebtedness in the rural areas were collected to assess the demand for rural credit. Further, data on the extent and mode of operations of different credit agencies were also collected with a view to examine the supply side of the credit. The first Rural Credit Survey was followed up with a similar Survey in 1961-62 by the Reserve Bank. The scope of the survey was extended to include capital expenditure in the household sector and other associated indicators of the rural economy. The second survey was accordingly titled 'All India Rural Debt and Investment Survey' and results were published in 1965. Both the surveys by the Reserve Bank were conducted for rural areas only.

(b) Surveys by the NSSO

The National Sample Survey Organisation (NSSO) has been conducting All-India Survey on Debt and Investment, decennially, since its 26th round (1971-72) in both rural and urban areas. These surveys generate basic information on assets, liabilities and capital expenditure in the household sector of the economy. The All-India Debt and Investment Survey (AIDIS), which was carried out as part of the 59th round of the National Sample Survey (NSS) during January to December 2003 (latest in the series), was the sixth such survey conducted at the all-India level. These reports by NSSO gives the estimates of indebted households and the amount of debt classified by various aspects at the State and all-India level in both rural and urban areas. At present, the decennially conducted AIDIS is the only nation-wide enquiry providing data on household assets, indebtedness and capital expenditure. The main objective of the AIDIS is to generate reliable estimates on assets, liabilities and capital expenditure of the household sector. The survey provides the details of household liabilities required for the formulation of credit policy of financial institutions and planning for development.

According to the AIDIS, the agency from which a loan was taken treated as the credit agency. The credit agencies were either 'institu-

tional agencies' or 'non-institutional agencies'. The various agencies which were treated as 'institutional agencies' were: government, co-operative agencies, commercial banks including regional rural banks, insurance, provident fund, financial Corporation/institution, financial company and 'other institutional agencies'. The agencies which were treated as 'non-institutional agencies' were: landlord, agriculturist money lender, professional money lender, trader, relatives and friends, doctors, lawyers and other professionals, and 'others'. Of all the characteristics in AIDIS, credit agencies and terms and rate of interest of loans have been probed into more deeply than the rest, in view of their historical importance regarding the supply side and cost of loans, respectively.

III. Persistence of Informal Credit in Rural Sector AIDIS Surveys

(a) All India Rural Credit Survey (1951-52)

Although, India inherited a basic network of credit cooperatives from the colonial era, the Reserve Bank's first decennial AIRCS 1951-52 (RBI, 1954) found that 92.8% of rural households relied on informal financial sector (Table 1). The investigation extended over nearly 1,30,000 families having residents in 600 villages and all types of credit agencies in 75 selected districts. During 1951-52, an increase in debt was recorded in all the 75 districts (in 20 districts the increase in debt was below 50%; in 31 districts the increase varied from 50 to 100%; in 19 districts from 100 to 200%; and in 5 districts the increase exceeded 200%).

The moneylenders' continued dominance in the beginning of Plan period (around 70% of rural credit) despite all measures to control them, suppress or supplant had led to the suggestion that '... any realistic system of rural credit should seek to incorporate him in itself rather than compete with him or wishfully expect to eliminate him'(RBI, 1954). Among creditors, the moneylender, and among moneylenders the professional moneylender dominates the rural credit scenario. The dominance itself has been made possible by the ineffectiveness of all attempts to organise a competitive agency for supply of rural credit. The first AIRCS had opined that the co-operatives were 'utter failure' in providing rural credit, but added they had a vital role in agricultural credit. Loans from relatives (virtually interest free) accounted for 14% of the reported borrowings of cultivators. About 6% of the total borrowings of cultivators were from traders and commission agents. The combined contribution of Government and Cooperatives was about 6% of the total rural credit, each accounting for about 3%. As for commercial banks, 1% represented the insignificant part played by them in the direct financing of the cultivator. In 44 out of the 75

districts selected for the survey, not a single pie was reported as having been borrowed by cultivators from a commercial bank.

AIRCS (RBI, 1954) pointed out that "agricultural prices during the survey year witnessed a stagnation followed by a steep decline for the first time in a period over ten years". However, a large part of the working funds borrowed by subsistence farmers seems to be related to consumption rather than production. The problem turned into more complicated one due to the socio-economic structure of the village with its characteristics of caste and inequality. Other factors that might have aided to the trend towards an increase in debt were relatively large incidence of drought, famine and inclement seasonal credit.

As our description built upon statistical data analysis and survey of literature, the brief about significance of informal credit agencies in supplying credit to rural areas during 1950s can be summarised as follows: Moneylenders were dominant not only due to their effective adaptation to rural areas, but also the ineffectiveness of any other competitive agency. Traders and Commission Agents were in direct contact with the cultivators and much of this financing was really in the nature of advance payment for purchase of products. The indigenous bankers were financier of trade and also traders themselves as well as finances moneylenders. Commercial banks were more interested in rural areas more for the purpose of getting

Table 1: Break-up of Institutional and Non-Institutional Rural Credit

(Per cent)

	1951	1961	1971	1981	1991	2002
Institutional Agencies	7.2	14.8	29.2	61.2	64.0	57.1
Government	3.3	5.3	6.7	4.0	5.7	2.3
Co-op. Society/bank	3.1	9.1	20.1	28.6	18.6	27.3
Commercial bank incl. RRBs	0.8	0.4	2.2	28.0	29.0	24.5
Insurance	--	--	0.1	0.3	0.5	0.3
Provident Fund	--	--	0.1	0.3	0.9	0.3
Others institutional agencies*	--	--	--	--	9.3	2.4
Non-Institutional Agencies	92.8	85.2	70.8	38.8	36.0	42.9
Landlord	1.5	0.9	8.6	4.0	4.0	1.0
Agricultural Moneylender	24.9	45.9	23.1	8.6	6.3	10.0
Professional Moneylender	44.8	14.9	13.8	8.3	9.4	19.6
Traders and Commission Agents	5.5	7.7	8.7	3.4	7.1	2.6
Relatives and Friends	14.2	6.8	13.8	9.0	6.7	7.1
Others	1.9	8.9	2.8	4.9	2.5	2.6
Total	100	100	100	100	100	100

*: includes financial corporation/institution, financial company and other institutional agencies.
Note: % share of different credit agencies to the outstanding cash dues of the households as on 30th June.
- denotes not available.

Source: All India Rural Credit Survey (1954); All India Debt and Investment Survey, Various Issues.

deposits rather than financing either agriculture or cottage industry.

(b) All India Rural Debt and Investment Survey 1961-62

In this second Survey by Reserve Bank, the outstanding loans owed to agriculturist moneylenders accounted for about 46% of the aggregate outstanding of all rural households, nearly double the share compared to first Survey. The share of outstanding loans owing to professional moneylenders was next highest though their share declined constituting 15% of the aggregate outstanding. As per the Survey findings on all-India basis (Table 1), the share of cooperatives was at 9.1%, 'others' at 8.9%, traders and commission agents at 7.7%, relatives at 6.8% and government at 5.3% in the total outstanding debt. The shares of landlords and commercial banks in the aggregate outstanding were negligible at 0.9% and 0.4%, respectively. This fact signifies the continuance of informal finance in rural India that might have prompted the nationalization of commercial banks in 1969 in the first phase.

(c) All India Rural Debt and Investment Survey 1971-72 to 2001-02

At the outset, it may be mentioned that the Survey results of 26th round (1971-72), 37th round (1981-82), 48th round (1991-92) and 59th round (2002-03) of AIDIS are comparable across the Agency-wise and State-wise over the period. In order to compare the progress of formal and informal finance after the bank nationalization and to provide an overview of the flow of credit to rural areas in terms of credit agency-wise, we have analyzed these Survey results in a comparative manner and State-wise separately. It is important to note that there are problems in using data from these surveys given the sharp reduction in sample size of households and villages, especially in the 37th round in 1981-82. It may further be mentioned that, the estimates of household debt starting from 48th round in 1991-92 are based on both cash and kind, whereas before that it was based on cash debt.

From Table 1, it can be assessed that the informal/non-institutional finance was gradually declining during the 1960s, was very nearly broken during the 1970s, with the institutional agencies making steady inroads into the rural scene. The share of institutional credit agencies in the outstanding cash dues of the rural households at the all-India level increased from 29% in 1971 to 61% in 1981 and then the pace of increase was arrested rising to 64% in 1991. During the following decade, the share declined by about 7% points and reached 57% in 2002. It seems that credit cooperatives, commercial banks, and other formal financial sector programs in rural areas have not displaced informal sources of credit, altogether. The 2002 AIDIS

survey revealed that 43% of rural households continue to rely on informal finance, which includes professional moneylenders, agricultural moneylenders, traders, relatives and friends, and others.

Institutional agencies (All-India Level)

From Table 1, it can be observed that, the most remarkable performance was that of the commercial banks while the share of co-operative societies in the outstanding cash dues of cultivator households increased from 20.1% in 1971 to 28.6% in 1981, therefore dropping to 27.3% in 2002, that of commercial banks rose to 29% in 1991, after rising sharply to 28% in 1981 from a meager 2% in 1971. It appears that the large number of branches that was set up by various commercial banks in 1970s and the subsequent introduction of rural banking schemes have driven the commercial banks to assume the role of principal credit agency in rural areas. It may be of interest to note that the share of government departments in the outstanding cash dues of cultivator households, after showing a decline from 7% in 1971 to 4% in 1981, again rose to 6% in 1991 and dropped to 2% in 2002. As a whole, at the all India level, among the institutional credit agencies, the co-operative societies and the commercial banks were the two most important agencies in the rural sector. These two agencies together, shared 91% of the entire amount of debt advanced by the institutional agencies, accounted for 52% of the outstanding cash debt, with co-operative societies (27.3%) accounting for a greater share than the Banks (24.5%) in 2002.

The gradual increase in the share of formal institutional credit in agriculture witnessed some reversal during 1991-2002 mainly because of a pull back by commercial banks. This disquieting trend is, in part, due to a contraction in rural branch network in the 1990s, and in part due to the general rigidities in procedures and systems of institutional sources of credit (Subbarao, 2012).

Non- Institutional agencies (All-India Level)

The combined share of all the non-institutional credit agencies in the outstanding cash dues of cultivator households recorded a sharp decline of 32% points during 1970s but the decline got arrested in the 1980s the fall being just of about 3% points but increased to 43% subsequently. The decline is found to be the steepest for the credit agency 'agricultural money lenders', whose share came down to 6 % in 1991 from about 9% in 1981 and 23% in 1971. However, the share of 'professional money lenders' has reported a rise to about 9 % in 1991, after registering a fall to 8% in 1981 from about 14% in 1971. Subsequently, the share has jumped to about 20% in 2002. Relatives and friends appear to be gradually losing their importance

as a source of credit. From 14% in 1971, their share fell to 9% in 1981, and dipped further down to about 7% subsequently. As a whole, among the non-institutional agencies, professional money lenders were the main source of credit. Among the non-institutional credit agencies, money lenders both professional and agricultural in that order were found to be important sources of finance in rural areas, their respective shares being 19.6% and 10.0%. The share of relatives and friends was 7% of the cash dues of rural households.

IV. Recent Reports on 'Informal Credit Related Issues'

In the absence of survey data beyond AIDIS 2002 (published in December 2005), we have heavily drawn upon three recent Reports (RBI, 2006; GOI, 2010; RBI, 2011) that were also based on the sample surveys and extended the AIDIS data. The Report of the Task Force on 'Credit Related Issues of Farmers' (Chairman: Shri U. C. Sarangi), submitted to the Ministry of Agriculture, Government of India, looked into the issue of a large number of farmers who had taken loans from private moneylenders, but not covered under the 'Agricultural Debt Waiver and Debt Relief Scheme' of 2008. The Task Force Report has observed that "...more disquieting feature of the trend was the increase in the share of moneylenders in the total debt of cultivators. There was an inverse relationship between land-size and the share of debt from informal sources. Moreover, a considerable proportion of the debt from informal sources was incurred at a fairly high rate of interest". About 36% of the debt of farmers from informal sources had interest ranging from 20 to 25%. Another 38% of loans had been borrowed at an even higher rate of 30% and above, indicating the excessive interest burden of such debt on small and marginal farmers. The continued dependence of small and marginal farmers on informal sources of credit such as private moneylenders was attributed to constraint in the rural banking network and services arising out of financial sector reforms. Rigid procedures and systems of formal sources preventing easy access by small and marginal farmers, vied with the easy and more flexible methods of lending adopted by informal sources. The Task Force members came across situations where farmers were borrowing at the rate of five to ten per cent per month.

The growing commercialisation of Indian agriculture has encouraged the rise of trader-moneylender, as the formal sector finance is inadequate to meet the growing credit requirements of agriculture. The Task Force (GOI, 2010) noted that the moneylender today comes in many forms as an outright lender, as a supplier of inputs/consumer goods, as a for-profit non-banking finance companies (NBFCs) including the for-

profit MFIs, as a buyer of produce, and as an owner of the land on which the farmer is dependent. The sheer numbers of moneylenders, easy access to them, and their intricate relationships with the borrowers coupled with limited access to formal institutions made it difficult for borrowers to complain against them.

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• Investments	: ₹ 47239.12 lakhs	₹ 53541.53 lakhs
• Money at Call & Short Notice	: ₹ 41609.52 lakhs	₹ 36055.34 lakhs
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Production constraints faced by the farmers in adoption of recommended groundnut technologies

G. Venkata Murali*
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Abstract

The study was conducted in three districts of the Andhra Pradesh viz., Krishna, Warangal, Anantapur considering 72 farmers for study the production constraints faced by the farmers in adoption of recommended groundnut technologies. Constraints were measured by asking the farmers to list out the important constraints they face in adoption of recommended groundnut technologies and their suggestion to overcome them.

India is the largest producer of groundnut in the world (32% of world production). There has been appreciable increase in the area (68.5%) and production (163%) of the crop between 1950-51 and 1998-99. Maximum increase in the area has been noted in the decade of 1950-51 and 1960-61 (43.8%) while the decade 1980-81 and 1990-91 has been very favourable in respect of production (50.0%). This increase in the area coverage of the crop has been at the expanse of cotton, jowar and bajra. Groundnut is a popular crop of South India. Four Peninsular states-Andhra Pradesh, Tamil Nadu, Karnataka and Gujarat together contribute over 80 per cent of the area and production of groundnut in the country. Andhra Pradesh is the third largest producer accounting for 24.69% of the total area and 18.79% of the total production of the crop in the country.

Andhra Pradesh is principally agrarian in character, consistently maintaining high levels of crop production in crops like rice, groundnut and chillies compared to several other Indian states. Groundnut is the premier oilseed crop of India, which ranks first in area (8.2 m ha) and second in production (6.2 mt) after china with an area of 4.63 m ha and production of 14.5 million tons (FAO, 2001). In Andhra Pradesh, it is being grown in an area of 18.6 lakh hectares with an annual production of 22.2 lakh tones. Though A.P. ranks second in groundnut area in the country, its productivity is very low (555-1100 kg/ha). Due to continuous drought

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during 1997, 1999, and 2002 the groundnut area had decreased from 22.2 lakh hectares (1995) to 18.6 hectares (2002-03). The production had also declined from 26.2 lakh tones (1995) to 20.3 lakh tones (2002-03), (Reddy S J, 2002). Further, more than 80% of groundnut area in A.P is under rainfed. In Andhra Pradesh, research work on groundnut is being carried out at Kadiri, Tirupati, Jagtial, Palem and Yellamenchalli.

Brief about Groundnut

The kernels are consumed either roasted or fried and salted. The oil cake obtained after the extraction of the oil is a valuable organic manure and animal feed. It contains 7-8% nitrogen, 1.5% phosphorus and 1.5% potash. It is a good rotation crop, it builds up the soil fertility by fixing atmospheric nitrogen through the root nodules and also an efficient cover crop for lands exposed to soil erosion.

Area of Cultivation - In India the cultivation of Groundnut is mostly confined to the southern Indian states, viz., Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra.

Season - Groundnut is essentially a tropical plant. It requires a long and warm growing season. The most favourable climatic conditions for groundnut are a well distributed rainfall of at least 50 cm during growing season, abundance of sunshine and relatively warm temperatures. It seems that plant will grow best when the mean temperature is from 21-26.5 Degree Celsius.

Soil - Groundnut thrives best in well-drained sandy and sandy loam soils, as light soil helps in easy penetration of pegs and their development and also harvesting. Groundnut gives good yields in the soil with pH between 6.0-6.5.

Rotation - Groundnut is grown in rotation with wheat, gram, pea, barley, etc. It is grown as a mixed crop with bajra, maize, jowar, castor and cotton. Groundnut can also be followed by safflower where early varieties are grown and moisture remains in the soil at the time of harvest.

Cultivation - Although groundnut is a deep-rooted crop but looking to its under-ground pod forming habit, deep ploughing should be avoided. One ploughing with soil turning plough followed by two harrowings would be sufficient to achieve a good surface tilth up to 12-18 centimetre depth. Seed should be inoculated with proper strain of Rhizobium culture particularly in those places where groundnut is to be grown for the first time.

Sowing - In bunch types, the row to row distance is kept 30-40 cm and in spreading types 45-60 centimetre. For this, 80-1000 kg of seeds per hectare would be enough for bunch types and 60-80 kg for spreading types. Plant to plant distance would be 15 and 20

centimetre for bunch and spreading types respectively.

Fertilizer and Nutrient Management - Like the other legumes, groundnut too meets the major part of its nitrogen requirement through nitrogen fixation. However, an application of 20-40 kg nitrogen per hectare as a starter dose should be given to meet the nitrogen requirement of the crop in the initial stage in poor fertility soils. If nitrogen is to be applied through fertilisers, prefer ammonium sulphate. It provides sulphur in addition to nitrogen. The soil should be tested for the availability status of phosphorus and potassium and fertilizer recommendations for groundnut be obtained. Phosphorus should be applied preferably through super phosphate.

Harvesting - It is necessary to dig the pods at the right time for obtaining higher yields of pods and oil. Nut takes two months to attain full development. A fully mature pod will be difficult to split easily with finger pressure. This stage is achieved when vine begins to turn yellow and leaves start shedding. Harvesting should be done when good percentages of nuts are fully developed and fairly intact. In case of bunch type of groundnut, the plants are harvested by pulling.

The present investigation was undertaken with the objective

1. To study the production constraints faced by the farmers in adoption of recommended groundnut technologies.

Methodology

An exploratory research design was adopted for the conduct of the study. The study was conducted in Andhra Pradesh covering all the three regions i.e., Coastal Andhra, Telangana, Rayalaseema in three districts i.e., Krishna, Warangal, Anantapur respectively. Two mandals were selected from each of the district and three villages were selected from each of the mandal. A total of 4 farmers from each selected village were chosen randomly arriving at the total sample of 72 farmers. Constraints faced by the farmers were measured by asking the farmers to list out the important constraints they face in adoption of recommended technologies and their suggestion to overcome them. For each problem indicated by the respondent one score was given. Respondents were tabulated based on frequency and percentage.

Findings

A cursory look at Table-1 revealed that unavailability of required quantity of seed was a major production constraint as mentioned by the groundnut farmers. It implies that the groundnut farmers will be highly receptive to adopt recommended technologies. Therefore, the agricultural university and state government can capitalise on this situation by providing sufficient

Table 1: Production constraints faced by the groundnut farmers in adoption of recommended groundnut technologies and their suggestion to overcome them.

n=72

S.No.	Problems	F	%	Suggestions	F	%
1.	Lack of cooperation from fellow farmers on IPM practices	29	40.27	Educate the farmers about the advantages of community approach	23	31.94
2.	Crop failure due to adverse climatic conditions	8	11.11	Drought resistant varieties should be developed	7	9.72
3.	Non availability of required quantity of FYM	18	25	Educate farmers about preparation of vermicompost	15	20.83
4.	Unavailability of required quantity of seed	53	73.61	Required quantity of seed should be provided	42	58.33
5.	Small land holdings to adopt recommended technologies	36	50.00	Develop technologies which are suitable for small land holdings	18	25.00
6.	Lack of knowledge on seed treatment	34	47.22	Demonstration on seed treatment should be conducted	25	34.72
7.	Difficult to follow spacing as it requires more time	39	54.16	Develop equipment for maintaining recommended spacing	43	59.72
8.	Time of sowing influenced by the seasonal conditions	29	40.27	Develop different varieties which are suitable for different dates of sowings	19	26.38
9.	Lack of literature on IPM practices	25	34.72	Sufficient literature on IPM practices should be provided	12	16.66
10.	Lack of knowledge on inter cropping practices	37	51.38	Educate the farmers on intercropping practices	27	37.50
11.	Non availability of loans to adopt recommended technologies	52	72.22	Provide credit facility to adopt recommended technologies	19	26.38
12.	Poor contact of extension agency with farmer	36	50.00	Coordination between Extension agency and farmers should be developed	30	41.66

F- Frequency %- Percentage

quantity of seed material. To overcome this production constraint they suggested to provide required quantity of seed. Hence, the administrative wing has to take policy decisions to supply the required quantity of seed material to the farmers.

Non availability of loans to adopt recommended technologies was

another major problem mentioned by groundnut farmers. This may be due to the fact that most of the farmers were unable to meet their farm expenses without any external assistance. Crop failures for continuous years enable the farmers as ineligible for fresh loans of any kind in succeeding years due to non-repayment of earlier loans.

Hence, the Nationalized Banks should provide credit facilities, especially long term loans to reap the benefits of recommended technologies, particularly to purchase improved agricultural implements, to take up land development activities, purchase of required inputs, etc.,.

The other problems and suggestions expressed by the farmers should be taken into consideration and relative importance should be analysed for effective technology dissemination of groundnut technologies

Conclusion

The availability of inputs and market facility having a major role in adoption, there is a need to revamp the whole system to facilitate an easy and timely availability of most important inputs like seed, credit and plant protection chemicals. There is an equal need to put an end to the exploitation of farmers by middleman by creating an effective network of marketing yards and by developing co-operation among the farmers.

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Utilization, diversion and recovery of crop loan by the borrowers of Bilaspur District of Chhattisgarh

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Introduction

The availability and utilization of crop loan in time and in adequate quantity tends to become a prerequisite for sustainable agricultural growth. In the same way repayment of crop loan in proper time inhabits a crucial importance because mounting overdues have an adverse effect on both the institutions, as well as on lenders. Therefore, necessary measures of operational efficiency must be taken by the financial institution to understand the factors responsible for default in repayment of loan.

The poor recovery performance of both the cooperative and commercial banks particularly in some states has been partly due to internal organizational inadequacies and partly due to the general environment. The state government would be expected to take necessary measures to ensure an appropriate climate for recovery and suitable assistance of the credit institution, both cooperative and commercial banks in the recovery of loans. It is, therefore, high time to study the impact of utilization of crop loan for paddy cultivation on borrower's behavior to able to focus on the causes of poor recovery in the different regions where the crop loan is provided to the farmers with a basic aim to minimize the financial risk. The causes of diversion of loan from productive to consumption purpose is another problem, which needs to be brought in light keeping following objective in sync with the study;

Objective

1. To find out the extent utilization of crop loan by the borrowers.
2. To identify the cause of poor recovery of loan.

Methodology

The study was carried out in Bilaspur district of Chhattisgarh state. In Bilaspur district Bilha and Mastruri block were randomly selected for the study. 10 villages of each block were considered on random selection procedures for fulfillment of the study. District central cooperative bank (DCCB), Bilaspur was selected on the basis of the maximum crop loan distribution to the farmers (200 farmers/borrowers).

Result and discussion

Utilization, diversion of crop loan and their recovery has been assessed and presented in Table-I.

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Table 1: Utilization, diversion and recovery of crop loan.

S. No.	Particulars	Marginal	Small	Medium	Large	All
1.	Kind	2910.74 (77.57)	3642.21 (57.97)	8181.44 (63.48)	22173.36 (60.15)	7288.31 (62.45)
2.	Cash	841.70 (22.43)	2640.83 (42.03)	4606.08 (36.02)	14696.89 (39.85)	4382.56 (37.55)
		3752.43 (100)	6283.04 (100)	12787.52 (100)	36870.19 (100)	11670.87 (37.55)
3.	Utilized	2509.54 (66.88)	3953.13 (58.12)	8869.92 (69.36)	19232.40 (69.93)	7059.06 (67.51)
4.	Diversion	1242.89 (33.09)	2633.08 (41.88)	3917.59 (30.64)	8121.76 (30.06)	3423.31 (32.49)
		3752.43 (100)	6286.21 (100)	12787.51 (100)	27454.16 (100)	10482.37 (100)
5.	Recovery	1784.52 (47.56)	4718.94 (75.11)	7236.64 (56.59)	13851.32 (51.26)	6016.41 (57.63)
	Total	**3752.43 (100)**	**6283.03 (100)**	**7236.64 (100)**	**13851.32 (100)**	**6016.41 (100)**

Mean=59.69 S.D.=13.09

Note: - Figures in parenthesis indicate percentage.

It reveals that nearly 68% amount of crop loan was utilized for right purpose. Irrespective of farm size of land holding, white 32% amount of crop loan was diverted for other purpose like consumption of daily needs, social ceremony etc. The recovery of crop loan was 57.63%, which has already been noted that cooperative bank had made poor recovery caused to mountaining overdues and its serious repercussion were received on loss of cooperative banks. Most of the time farmers/borrowers were found to be reluctant to kind portion of loan but it was noted to be 69.81% and cash amount was found to be 30.19% only. The diversion of loan seems to be common among borrowers/farmers, which was around 33% on overall basis.

It is obvious from the Table-2 that majority of borrowers (53%) utilized the crop loan received from the bank under medium extent, followed by nearly 44% borrowers who had utilized to high extent, whereas, only 3% of respondents/borrowers utilized the crop loan to low extent. It shows that half of the borrowers had

Table 2: Crop loan utilization of borrowers / farmers.

S. No.	Extent of utilization level	Frequency	Percentage	't' Value	D.f.
1.	Low (01)	06	03	1.20ns	5
2.	Medium (02)	106	53	4.54**	105
3.	High (03)	88	44	9.27**	87
	Total	**200**	**100**	**8.96****	**199**

Mean=59.69 S.D.=13.09

*Significant at 5% level at given d.f.

Table: 3 Causes of Poor Recovery of Crop Loan

(N=200)

S. No.	Particulars	Reporting Number	Percentage	'K' Value	Remark/ Rank
1.	Failure of crop (paddy) due to natural calamities	115	57.5	16.91	1
2.	Low incremental income	72	36.0	10.90	II
3.	Diversion of loan from production to consumption purpose	28	14.0	5.80	IV
4.	Habitual for non-repayment	12	06.0	3.75	VI
5.	Political influence	19	09.5	4.76	V
6.	Integrity of characters	30	15.5	6.20	III

Significance at 5% probability level

utilized the crop loan provided to them by bank in a proper way for productive and stipulated purpose showing the borrowers positive behavior of extent utilization of crop loan.

From the Table-3 it was revealed that out of 200 borrowers/farmers 115(57.5%) reported the crop failure due to natural calamities, faremost cause of poor recovery of crop loan. While low incremental income reported by 72 borrowers (36%) as a major causes of poor recovery and its ranked second. Integrity of characters of the borrowers after taking loan was reported by 30 borrowers/farmers (15.5%) and it ranked third causes of poor recovery of crop loan. The percentage for various causes were tested. All the percentage were significant at 5% level of probability.

Conclusion:

It is therefore suggested to the cooperative banks that they should give the options to the borrowers/farmers for kind portion of crop loan. The diversion of loan should be check through constant vigilance by banking officers. It is observed in the study that the borrowers had positive behaviors of extent utilization of crop loan.

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Cooperatives, including banks, not under RTI

Cooperative societies including coop banks will not fall within the definition of 'public authority' for purposes of the Right to Information Act, and hence the Registrar of Cooperative Societies is not liable to provide information to the general public under this law, the Supreme Court has held in the case, Thalappalam Service Coop Bank Ltd vs state of Kerala.

It said that the powers exercised by the Registrar and others under the Cooperative Societies Act are "only regulatory or supervisory" and will not amount to dominating or interfering with the management or affairs of the society so as to control it. Besides, "the societies are not statutory bodies and are not performing any public functions and will not come within the expression 'state' within the meaning under Article 12 of the Constitution of India," it added.

Recognising that the right to privacy was a sacrosanct facet of Article 21 of the Constitution, the apex court said that if the information relates to personal information, the disclosure of which has no relationship to any public activity or interest or which would cause unwarranted invasion of the privacy of the individual, the Registrar, even if he has got that information, is not bound to furnish the same to an applicant, unless he is satisfied that the larger public interest justifies the disclosure of such information, that too, for reasons to be recorded in writing.

In this case, various coop societies had challenged the full Bench of the Kerala High Court's judgment that upheld the state government's circular and brought coops within the RTI ambit.

The state government claimed the circular to be in the larger public interest so as to promote transparency and accountability in the working of every co-operative society in Kerala.

Efficacy of the banking correspondent model under question

A survey of 860 agents in 11 States by MicroSave, a financial inclusion consulting firm, raises questions over the efficacy of the banking correspondent model. The 2012 study, conducted along with the RBI College of Agricultural Banking, found that 58% of banking correspondents surveyed simply weren't making enough money, earning less than ₹3,000 a month. The poor earnings seem to have affected the quality of service provided to the 109.9 million new accounts opened between March 2010 and March 2013 under the

Government's financial inclusion drive. Consequently, transaction volumes in these accounts mostly opened in unbanked rural areas have been low, raising a question mark over the actual impact of this programme. The root of the problem may lie in the kind of correspondents appointed by banks and their partners. In the rush to meet the RBI's account opening targets, a large number of agents were enlisted, often with little attention being paid to their ability to provide services beyond account opening.

MicroSave found that a sizeable portion of the "listed" banking correspondents in India are no longer offering services, suffer from chronic system downtime, or lack the cash to facilitate disbursements. The study covered agents listed on bank Websites as correspondents. A quarter of those surveyed were not in a position to process transactions at the time because they had no equipment or sufficient cash to meet withdrawal requests. The results suggested a 37% dormancy rate among the banking correspondents surveyed. In this respect, MicroSave says banks need to offer one or two "anchor" products to make the business grow and build trust in the agent network. These products must be simple to comprehend and drive volumes. In most countries, these are person-to-person or government-to-person remittances.

Banking on rural cooperatives

Calgary Cooperatives Association runs retail stores akin to Wal-Mart, a large petrol and gas station and a finance and leasing outfit of the size of Reliance. Credit Unions of Canadian Cooperative Association are as good as big as any other commercial bank of Canada and compete effectively in the financial sector. Members who join at nominal membership cost get shares at the end of the year on the basis of their transactions with the cooperative society providing members incentive and also enable efficient member participation.

Although Indian cooperatives have a brand image in milk (Amul), fertilisers (KRIBCO & IFFCO), and fruits in some areas, rural credit cooperatives that mostly serve the small and marginal farmers and artisans and small enterprises carry an image of mistrust due to excessive political interference, misgovernance and mismanagement. The efforts to rectify these through legal reform in the shape of 97th Constitution Amendment Act, 2011, has been struck down by the Gujarat High Court, except for upholding the amendment to Article 19, Section 4(C).

The purport of the clarification is that the technologically enabled PACS with sound financials can

choose to become BCs by separating their core and non-core businesses and give better value to their members, in line with the recommendations of the RBI Expert Committee. PACS as BCs can set up ATMs and also accept deposits for their principals that would have the guarantee of the Deposit Insurance and Credit Guarantee Corporation (DICGCI), as the principals are RBI licensed banks. This would help speeding up financial inclusion in the villages, as commercial banks and existing BCs are finding it difficult to reach out to remote villages.

The role of BCs as mentioned in the 2012-13 first quarter monetary policy (para 72) RBI briefly reads thus: "While all the efforts made for financial inclusion have expanded the access to banking services, it is also important that quality services are provided through newly set up ICT-based BC delivery model. It is, therefore, necessary to have an intermediate brick and mortar structure between the present base branch and BC locations so as to provide support to about 8-10 BC units at a reasonable distance of 3-4 km.

"The BC model allows banks to do cash-in-cash-out transactions at a location much closer to the rural population, thus addressing the last mile problem. The Deputy Governor RBI, K. C. Chakrabarty says: "Banks must not approach financial inclusion as charity but as viable business model." This now applies equally to District Central Cooperative Banks (DCCBs) and State Cooperative Banks (SCBs). Low volumes of transactions would not make the BCs viable. Most PACS have only low volumes because their agricultural lending is in a large measure only to the small and marginal farmers. An RBI committee has clearly mentioned that but for the PACS' role in farm credit, this clientele would have been starved of institutional credit.

This leaves us with the logical conclusion that the PACS would end up as losing entities even as BCs; more so, because their principals would not be in a position to pay more commission than their commercial bank counterparts. While the DCCBs could be in core banking solutions, the manually operated PACS with inefficient accounting practices would not serve as BCs capable of delivering financial inclusion results.

There must be a firm resolve on the part of all the existing PACS that they should mop up share capital to cover additional business risks other than credit risks. Active members should be legally defined in the State cooperative laws; these alone should have say in the governance and management of affairs of PACS.

Urban co-op banks can now lend more for house repair, alterations

The Reserve Bank of India has enhanced the ceiling on loans extended by urban co-operative banks (UCBs) to individuals for carrying out repairs / additions / alterations to their dwelling units. The new ceiling on such loans will be ₹2 lakh (₹1 lakh earlier) in rural and semi-urban areas and ₹5 lakh (₹2 lakh) in urban areas. Loans granted under the enhanced limits will also be eligible for classification under priority sector, the RBI said in a notification.

The exposure limit of UCBs to housing and commercial real estate loans continues at 10% of their total assets. The 10% of total assets ceiling can be exceeded by an additional 5% of total assets for grant of housing loans to individuals up to ₹25 lakh, which is covered under priority sector. Tier-I UCBs (having deposits below ₹100 crore) are permitted to extend individual housing loans up to a maximum of ₹30 lakh per beneficiary of a dwelling unit. Tier-II UCBs (other than Tier-I UCBs) can extend individual housing loans up to a maximum of ₹70 lakh per beneficiary of a dwelling unit subject to current prudential exposure limits.

According to the RBI, UCBs, with their vast network, occupy a strategic position in the financial system and have an important role to play in providing credit to the housing sector. There are about 1,600 UCBs in the country.

Debt recovery tribunals sit on cases worth ₹1.43 L cr

Close to 43,000 cases involving a whopping ₹1.43 lakh crore were pending with 33 debt recovery tribunals (DRTs) across the country at the end of FY13. Of course, the DRTs managed to dispose of 9,816 cases in the last fiscal involving ₹18,162 crore. But fresh filings of 14,666 cases in the last fiscal with claims of ₹48,037 crore pushed up the overall pendency.

Incidentally, the net non-performing assets or NPAs (bad loans after making provisions) of banks had gone up 51% in FY13 to ₹92,825 crore. According to a recent Crisil report, the gross NPAs of banks are slated to increase from 3.3% in March 2013 to 4% by March 2014. The delays in DRTs have in turn affected the value of assets that are to be recovered, which is a matter of concern for banks, financial institutions and asset reconstruction companies.

The huge pendency is a worry especially because DRTs were set up by the government under the Recovery of Debt Due to Banks and Financial Institutions Act, 1993 (RDBFI Act), to expedite the recovery of bad debts of banks and FIs. Notably, the Act advises the tribunals to dispose of each case within 180 days from the date of its filing.

Don't use banknotes as garlands, says RBI

The Reserve Bank of India (RBI) has come out against misuse of banknotes by making garlands out of it, decorating pandals and places of worship or for showering on personalities at social events. "Banknotes should be respected as they are a symbol of the Sovereign and public should not misuse them and help in increasing the life of banknotes," the central bank said in an appeal to the public.

The RBI said it has been taking all measures to supply clean banknotes across the country and has urged the members of public to contribute to its efforts in pursuing a 'clean note policy' for the country.

Nabard union cautions against recasting cooperative credit system

All-India Nabard Employees' Association has said that basic features of cooperative credit structure should not be tinkered with until after an informed nationwide debate on the matter. The demand comes in the context of a Reserve Bank directive to the National Bank for Agriculture and Rural Development (Nabard) that it should pilot the reforms in the cooperative sector. The directive could have implications even for Centre-State relations as cooperatives still continue to be in the State list, said Jose T. Abraham, president of the employees' association. Conferring overriding powers on the Reserve Bank to issue directions to cooperatives by superseding their elected boards impinges on States' rights, he added.

Abraham recalled that the Kerala High Court has already stayed implementation of a contentious Nabard circular of July 22, 2013. The circular advised primary agriculture cooperative banks to act as business correspondents of Central/State cooperative banks. Assets of primary cooperatives arising out of all lending operations will stand transferred to the books of Central/State cooperative banks along with their related liabilities. All deposits collected would be transferred too. Primary cooperatives will not accept deposits on their own account and will not henceforth do any financial operations of any kind on its behalf. In this manner, the primary cooperatives would be gradually eased out from business as the bottom-most layer of the short-term cooperative credit structure.

Primary cooperatives will find it difficult to survive in the emerging scenario and will have to contend with non-financial businesses such as public distribution or selling fertilisers. That subsidies applicable to these operations are going to be withdrawn in favour of direct cash/ benefit transfer scheme is not helping matters

either, Jose T. Abraham said. The proposed change in their role will result in more farmers moving away from the short-term cooperative credit structure.

It may be noted that, a recent Reserve Bank study of Ernakulam district of Kerala had found that cooperatives served small farmers and poor people better than commercial banks. Weakening of primary cooperatives will not only hurt the cause of financial inclusion but may also have repercussions for institutional credit arrangements for small and marginal farmers, Abraham said.

Some urban co-op banks can get scheduled status: RBI

The Reserve Bank allowed urban cooperative banks (UCBs) with total deposits of over ₹750 crore to graduate to scheduled bank category. If UCBs fulfill certain listed criteria, it will eligible for inclusion in the second schedule, the RBI said in a notification. All the public sector banks, private sector banks, foreign banks, regional rural banks are part of the second schedule.

According to the Government's notification, with effect from April 1, 2013, only those primary co-operative banks whose demand and time liabilities are not less than ₹750 crore would be treated as a financial institution for the purpose of inclusion of UCBs in the Second Schedule of the Reserve Bank of India Act, 1934.UCBs desirous of seeking inclusion in the schedule should fulfill certain other criteria including continuous net profit for the previous three years, capital adequacy ratio of 12% and gross non-performing asset of less than 5%. Besides the bank needs to comply with Cash Reserve Ratio and Statutory Liquidity Ratio requirements and there should not be major regulatory and supervisory concern.

Finding no place on Nachiket Mor committee, cooperatives feel let down

The Reserve Bank announced the setting up of the committee under the chairmanship of Nachiket Mor, member on the central board of directors. Representatives of new generation banks and corporates dominate the committee. The cooperatives sector, which has pioneered the financial inclusion drive in the country for more than a century, feels let down after failing to find representation on the committee.

The country's short-term cooperative credit system has 50% more accounts than the commercial banks and regional rural banks put together. It commands membership of more than 120 million rural people, making it one of the largest rural financial systems in the world.

The Rangarajan committee on financial inclusion had in its report

said that a financially sound cooperative structure can do wonders for financial inclusion given its extensive outreach. The activists pointed out that the latest challenge comes not too soon after the National Bank for Agriculture and Rural Development's (Nabard) directive on the future of primary cooperative societies. The directive, withdrawn since, had sought transfer of assets and liabilities of societies to district and State cooperative banks before converting themselves as business correspondents of the latter.

Make contracts simple to help customers, RBI official tells banks

Simpler contracts will put an end to the many hidden penalties and fees in complex loans, according to Deepali Pant Joshi, Executive Director, Reserve Bank of India. This will make everyone aware of what (loan contract) they are signing.

Banks need to apply principles of transparency to enable easier decision-making by clients, and verify assumptions about what clients understand and don't understand about their products and the fine print in the contracts they sign.

"If you've ever applied for a credit card, a student loan, or a housing loan, you know the feeling of signing your name to pages of barely understandable fine print. What often happens as a result is that many people are caught by hidden fees and penalties, or saddled with loans they can't afford," said Joshi in her keynote address at the College of Agricultural Banking, Pune.

Banks need to address the needs of the customer and customise products and services without adopting a one-size-fits-all approach, she added. The RBI official observed that the greatest threat arises from the asymmetries information and power between financial institutions and poor consumers. Financial education is an important tool to address this imbalance and help consumers, she said.

Rice, the new beauty aid

Rice, the staple cereal, can soon be a pain reliever, skin moisturiser or meet other skin-care needs. A beginning towards this has been made with the Directorate of Rice Research, under the Indian Council of Agricultural Research, coming out with the country's first rice-based pain relieving gel and skin moisturising lotion. "Our two new products have yielded encouraging results during trials and limited marketing. We are now ready to transfer the technology through tie ups with skin care product makers and retailers on a royalty or partnership basis," B.C. Viraktamath, Project Director.

The institute, which sells hybrid seeds and services to private

companies on a licensing basis, is in talks with small retailers and healthcare companies for taking up production on a commercial scale. The skin-care product was made at DRR laboratory from rice bran oil and aqueous brown rice extract as key ingredients.

Due to the brown rice, the product also contains oryzanol, vitamins and other anti-oxidants that are known to have anti-aging qualities. "The starch extracted from brown rice acts as a gelling agent, providing moisture to the skin slowly but for a longer period of time. At laboratory scale, the production cost of 100 gm is just ` 13. Thus, a ` 5 lakh unit can produce 50 kg of the gel daily," he said. The pain balm herbal formulation contains rice bran oil as a carrier, which helps active ingredients such as camphor, menthol and eucalyptus oil get absorbed in the skin faster, and providing quick relief.

SMS alerts on usage basis, RBI to banks

The RBI, asked banks to charge customers for transaction SMS alerts on the basis of usage, instead of imposing a fixed fee, to ensure equity and to be reasonable. "Banks are advised to leverage the technology available with them and the telecom service providers to ensure that such (SMS) charges are levied on all customers on actual usage basis," the Reserve Bank of India said in its Second Quarter Review of Monetary Policy 201314. In March 2011, the RBI had set guidelines for banks to send online alerts to customers for all types of transactions, irrespective of the amount.

Only ₹50,000 in cash for at-par cheques

To mitigate the risk of money laundering and terror funding, the Reserve Bank has asked banks not to pay more than ₹50,000 in cash to customers holding at-par cheques. Regional rural banks and co-operative banks are advised to utilise the at-par cheque facility only for their own use and payment of cash should not exceed ₹50,000, the RBI said in a notification. All transactions of ₹50,000 or more should be strictly by debit to the customer's account, it said.

Government invites farm research projects under NFSM

The Government invited farm research projects for funding under the centrally-sponsored scheme National Food Security Mission (NFSM). About ₹200 crore has been earmarked for supporting scientific research on subjects crucial for attaining goals of the Mission during the 12th Five Year Plan (2012-17), it said. "The Agriculture Ministry has issued guidelines on how research institutes can submit

research projects to it for funding under the NFSM scheme," an official release said.

The projects can be in areas ranging from conservation and efficient use of natural resources to management of diseases and pests, farm mechanisation, rain-water harvesting, improving agronomic practices and so on, it said. One important requirement of the research project would be that its outcome should be available in 3-4 years for adoption on large scale, it added. NFSM, launched in 2007-08.

Financial inclusion Makes 2.5 Lakh Villages Bankable

The government's efforts at financial inclusion are finally bearing fruit. Banks have reached out to 2.5 lakh villages in the last couple of years, and at this rate, it may take a few more years to cover at least half the population of India with banking services. According to the RBI statistics, banks have set up nearly 268,000 outlets in villages as on March 2013 against 67,694 banking outlets in March 2010. They have opened about 7,400 brick-and-mortar branches in rural centres during this period. Nearly 109 million basic savings bank accounts have been added, taking the total to 182 million.

Indian banks started using the services of business correspondents with electronic handhold devices to improve financial penetration. Following this initiative, the share of information and communication technology (ICT)-based accounts to all new basic accounts has increased from 25% in March 2010 to 45% in March 2013. About 490 million transactions have been carried out in ICT-based accounts through correspondents during the three-year period. "The number of transactions through ICT-based BC outlets, though increasing, is still very low when compared with the manifold increase in the number of banking outlets and the number of accounts," executive director Deepali Pant Joshi was quoted as saying.

Create global agri service cadre: Swaminathan

Eminent agricultural scientist Dr. M.S. Swaminathan has suggested creating an international cadre of agricultural research services (ARS) to help the developing nations in Africa and Asia. With the recent implementation of the Right to Food Act and transformation of India as a surplus food producer, many countries are looking up to us, Dr. Swaminathan said stressing upon the need to create an international cadre of ARS on the lines of Indian Foreign Service. He was speaking at the 40th Foundation Day of the Agricultural Scientists Recruitment Board (ASRB). ASRB is an

independent recruitment body for the Indian Council of Agricultural Research.

Dr. Swaminathan also suggested that ASRB redefine the procedures for career advancement of scientists. Such a move assumes significance in attracting young people to farm sector. R.S. Paroda, former Director General of ICAR said that as India starts playing a major role in global agricultural trade, it becomes imperative for the Government to open agri attach at the Indian embassies overseas. ASRB Chairman, Gurbachan Singh, said the entire recruitment process will go online from next year onwards. So far, it has recruited about 10,000 scientists for ICAR, including some 6,500 entry level scientists through All India ARS examinations.

Public sector banks lagging in risk appraisal skills

Most banks have identified training gaps in the areas of credit/risk management, agriculture programmes, and foreign exchange, according to Reserve Bank of India Executive Director G. Gopalakrishna.

These areas require an equal measure of knowledge of rules, practices and specialised skills for appraisals, on the one hand, and an awareness of markets, on the other, he said. Banks, require training by external experts and institutions in these areas. Stating that the training needs cannot be uniform across the banking industry, as each bank has a unique structural make-up of its own with a different set of aspirations, he said: "What applies to a public sector bank may not be applicable for a different skill set present, say, in foreign banks and new generation private sector banks." Public sector banks have shortage of skills in credit appraisal and risk management, whereas new generation private sector banks and foreign banks have better skills in these areas, he said.

The training intervention in banks will have to be geared towards orienting, facilitating and encouraging more employees to take up positions in such areas to manage the competitive rush, Gopalakrishna said. Stressing the need for the institution to follow a regimen of analysing training needs, he said this would help ascertain specific training requirements and address them specifically.

Provide loans to women self help groups at 7%: RBI to PSBs

The Reserve Bank directed public sector banks (PSBs) to provide loans to women self help groups at a rate of 7% per annum so as to get the benefit of interest rate subvention scheme under the National Rural Livelihood Mission.

This subvention will be available to all the PSBs on the condition that they make SHG (self help group)

credit available at 7% in the 150 districts," the RBI said in a notification. Likewise, the regional rural banks (RRBs) will be subvented to the extent of difference between the lending rates and 7% for the FY-2014 on the condition they make SHG credit available at 7%, it added. The SGSY scheme comes under the Ministry of Rural Development which launched National Rural Livelihood Mission on April 1, 2013 to reduce poverty by building strong institutions of the poor, particularly women. The RBI further said that SHGs will be given an additional 3% subvention on prompt repayment of loan. For all loans up to ₹3 lakh, sanctioned to women SHGs on or after December 1, 2013, banks must charge an interest rate of 7%. However, for loans extended between April 1, 2013 and November 30, 2013, banks should convert the rate of interest to 7% for all the existing loan accounts of the SHGs with effect from April 1, 2013. While for additional subvention of 3%, banks may submit one-time consolidated claims during the entire year 2013-14 latest by April 30, 2014.

Banks to get ranked on service

BCSBI, a Reserve Bank of India (RBI) initiative, plans to rank banks based on their adherence to banking codes - a list of minimum commitment to customers. In terms of the RBI mandate, at the time of opening a bank account, every customer will receive a set of banking codes from the bank. These codes, which are prescribed by BCSBI, give the customer an idea of the minimum level of service he can expect from the bank. The central bank has described the codes as a charter of rights for the common person. If a bank does not stick to its minimum standard of commitments, customers can take it up with the regulator or ombudsman.

Besides ranking banks, the BCSBI is also rewriting its list of codes to address customer issues that have arisen in recent years. The new codes may require banks to spell out their minimum commitments to customers in respect of addressing internet frauds, cyber security and opening of small accounts. Mahajan said that the banking codes are subject to periodic revisions and the BCSBI had received a number of suggestions, including those based on banking developments in recent years.

Aadhaar link now mandatory for card transactions

The Reserve Bank of India (RBI) has made it mandatory for banks to implement Aadhaar authentication for card transactions at merchant locations. The central bank said "all new cards' present infrastructure" has to be enabled for recent security measures,

including an embedded EMV chip and a mandatory PIN, besides Aadhaar validation at point of sale (PoS) terminals.

Aadhaar is currently used by banks to establish identity while opening bank accounts, which can then be used to make sure that subsidy payments are routed directly to beneficiaries. RBI had directed banks to issue chip-based cards by November 30, 2013 to tackle rising fraud. The latest directive could mean additional expenditure for banks as they put in place the mechanism for biometric checks through the system established by the Unique Identity Authority of India that issues the Aadhaar number.

Three states get ₹450 cr for crop diversification plan

In a bid to shift a chunk of area under water-intensive paddy cultivation in Punjab, Haryana and western Uttar Pradesh to maize, oilseeds and poplar-based agroforestry, the government has allocated more than ₹450 crore in the current fiscal for their promotion. Agriculture ministry has allocated ₹224 crore to Punjab, while Haryana and western UP have been provided with ₹98 and ₹124 crore, respectively.

Under 'crop diversification in original green revolution states' programme, finance minister P Chidambaram had provided around ₹500 crore for the current fiscal in the Union Budget (2013-14). The key focus of the programme, taken up under the Rashtriya Krishi Vikas Yojana, was on encouraging farmers to take up alternative crops and restoring soil fertility through technological inputs. The scheme is being implemented through state departments of agriculture in identified districts via a cluster approach.

"We intend to shift about 5% of paddy area in these three states to alternative crops through demonstration via clusters," an official said. While 60% of the ₹450 crore has been allocated to promotion of alternative crop cultivation, 23% of the total amount has provided under improving farm mechanisation. The remaining funds have been earmarked for site-specific activities.

The programme is being implemented in 20 districts of Punjab and nine districts of Haryana and 15 of western UP. It aims to provide an assistance of ₹10,000 per hectare for maize, kharif pulses, oil seeds and poplar-based agro forestry. Also, financial assistance of ₹5,000 per hectare is being given to farmers for inter-cropping of pulses and wheat. Kalkat had said paddy cultivation over 28 lakh hectare can't be sustained. "We have to replace at least 12 lakh hectare with other crops. If we get an assurance from the government on the procurement of maize and better

soyabean variety, we can reduce the area under paddy by next 5-6 years,".

A scientist with the Indian Agricultural Research Institute (IARI) said concerns relating to diversification of rice-wheat cropping system in NE came to fore when yields of these two critical crops stagnated and net profit accruals showed a diminishing trend. A committee of secretaries appointed by the Centre had stated that the original green revolution states were confronted with stagnating yields and over-exploitation of ground water resources, "which call for immediate diversification in crops through promotion of technological innovation to enable farmers to improve soil fertility and arrest depletion of groundwater, besides increasing farm income".

Weather-based crop cover finds favour with farmers

With unpredictable weather conditions, such as erratic rainfall, fluctuations in temperature and changes in relative humidity affecting crop output, the Weather Based Crop Insurance Scheme (WBCIS) offered by various private and public sector companies is gradually being accepted by farmers seeking protection from crop losses.

The scheme, piloted in the states of Punjab, Haryana, Rajasthan, Madhya Pradesh and Uttar Pradesh in rabi of 2007, has, for the first time in the country, given farmers a cover against crop losses from adverse weather conditions. Provided by Agriculture Insurance Company of India (AICI), a company mainly owned by four state-owned general insurance companies and Nabard, the scheme covers more than 35 perennial crops such as apple, citrus fruit, grapes, mango, pomegranate, cashew nut, oil palm etc. As per AICI data, the weather-based product scheme, when implemented across 13 states in kharif 2012 and 14 states in rabi 2012-13, had insured 35 lakh and 37 lakh farmer, respectively.

"Weather based insurance provides risk management tools for farmers to deal with climate change adaptation initiative," Pramod Aggarwal, regional programme leader, Research Programme on Climate Change, Agriculture and Food Security (CCAFS) platform, said. CCAFS has been, in collaboration with AICI, promoting the weather-based insurance among farmers. So far, only about 30 million farmers out of 120 million have been covered under the National Crop Insurance Scheme, which mainly covers yield losses. About 70% of these are accounted for by farmers who own less than four hectares.

For the national crop insurance scheme, companies provide coverage based on yield, for which historical yields of the crops concerned are taken into

consideration while for weather-based insurance, the historical data of yield is not needed.

The Comprehensive Crop Insurance Scheme (CCIS), introduced in 1985 by the centre in collaboration with state governments, was linked to short-term crop credit, where all loans for notified crops in a specific area were compulsorily covered. Close to 60 lakh farmers benefited from the CCIS and the majority of claims were paid in states such as Gujarat, Andhra Pradesh, Maharashtra and Orissa.

Dr. Harsh Bhanwala is new Nabard Chairman

The Centre has appointed Dr. Harsh Kumar Bhanwala as Chairman of the National Bank for Agriculture and Rural Development (Nabard). He assumed charge on December 18, 2013.

Prior to this appointment, Bhanwala was an Executive Director at India Infrastructure Finance Company Ltd (IIFCL), a state-owned infrastructure lender.

Bhanwala, who had earlier worked as an officer at Nabard, succeeds Prakash Bakshi, who retired as Nabard Chairman in September. Before joining IIFCL, Bhanwala was senior vice president in IL&FS Water Ltd, which was involved in development work in water and waste water projects.

Financial inclusion can be better achieved through self-help groups: Nabard

The two-decade-old self-help group-bank linkage programme for the economic betterment of rural poor is not receiving bankers' attention, says Nabard. This observation comes in the backdrop of the Government pushing banks to step up their financial inclusion (FI) drive through intermediaries such as business correspondents (BCs) and business facilitators (BFs) in the last three years.

The FI drive, whereby financial services are sought to be extended to the hitherto large un-served population of the country, envisaged by the Government and the Reserve Bank of India entails banks engaging the services of BCs and BFs. SHG-BLP (self-help group-bank linkage programme) is a step towards bringing the 'unbanked' poor into the mainstream banking channel, its formal acceptance as a financial inclusion channel by the central bank is still awaited. An SHG is a homogeneous group, comprising 15-20 members (mostly women), where members first pool in their savings and give out small loans to needy members. Once the SHG successfully undertakes savings and credit operations from its own

resources, it can borrow from a bank (SHG-BLP) to enhance its pool of resources.

The scope of activities undertaken by the BCs include disbursal of small-value credit; recovery of principal / collection of interest; collection of small-value deposits; sale of micro insurance, mutual fund plans, pension and other third-party products; and receipt/ delivery of small-value remittances and other payment instruments. BFs provide services such as identification of borrowers; collection and preliminary processing of loan applications; creating awareness about savings and other products; post-sanction monitoring and follow-up for recovery.

Nabard said "though several initiatives were taken by the Government, the central bank, Nabard and banks to bring the poor into the fold of formal financial service providers, no serious attempt was made to leverage the SHG-BLP to achieve the financial inclusion goals." The 'Status of Microfinance in India' report observed that a successful programme such as the SHG-BLP, which could link millions of rural poor to the formal banking system, could have been the main instrument for financial literacy and financial inclusion in the country.

There are a number of plausible ways by which matured SHGs could have been participants in the financial inclusion initiative, including being agents of providing direct banking services to the poor at their doorsteps, as a low-cost and efficient alternative. "This model is certainly a more cost effective and reliable alternative to the existing inclusion agenda and millions of households, now members of SHG-BLP, would have been the immediate beneficiaries," said Nabard.

RBI launched new ISO 20022 compliant RTGS System with added features

Dr. Raghuram Rajan, Governor, Reserve Bank of India, launched the new Real Time Gross Settlement (RTGS) system of the Reserve Bank of India. The Governor said that payment system like plumbing has to be efficient and ahead of the financial markets to be able to take care of the future developments in the financial markets. With its advanced liquidity and queue management features, the new RTGS system is expected to significantly improve the efficiency of financial markets. He hoped the new RTGS system would be such a driver for India's financial system.

Some features of the new RTGS system are as follows:

- Reportedly the first in the world to be built on ISO 20022 messaging standards,
- The new RTGS system is highly scalable and will have several new functionalities that include advance liquidity features, including gridlock resolution mechanism and hybrid settlement facility, facility to accept future value dated transactions, options to process multi-currency transactions, etc. These functionalities, as and when made available for use, will be notified to the participants.
- The new RTGS system provides three access options to participants thick-client, Web-API (through INFINET or any other approved network) and Payment Originator module. The participants can decide the mode of participation in the system based on the volume of transactions and the cost of setting up the infrastructure.

RTGS system is a large-value funds transfer system which banks use to settle interbank transfer system for their own account as well as for their customers. It was first implemented in India in March 2004 as a major technology based electronic funds transfer system across the country. The system facilitates customer, inter-bank payment on a 'real' time and on gross basis. The system also facilitates settlement of Multilateral Net Settlement Batch (MNSB) files emanating from other ancillary payment systems. The RTGS infrastructure is critical in facilitating the orderly settlement of payment obligations. The role of central banks as operators of large-value payment systems is important in the context of the broader role of the central bank in a nation's financial system insofar as it offers “safety net” attributes by providing final settlement in central bank money.

NPAsource.com a portal for e-auction of NPA

Every year properties worth hundreds of crore are seized by banks and financial institutions, as their owners default on repaying the money they had borrowed from them. Banks then auction these properties, which may not always fetch market prices. The problem is that not many people get to know about these auctions as banks don't want to disclose details of their non-performing assets. Now, there is a solution in the form of NPAsource.com, a portal for e-auction of NPAs of financial institutions.

NPA source gathers all information from the banks on their NPAs after which it analysis and crosschecks the properties before listing them on the portal. These properties includes residential, commercial and industrial.

RBI cautions public against fake e-mails promising gains

The Reserve Bank of India has cautioned the public against fictitious e-mails sent in the names of the central bank and Governor Dr. Raghuram Rajan promising windfall gains, saying it does not send out such communications. The RBI has run awareness campaigns about fake e-mails on a regular basis through its website and other media, promising high returns or jackpot wins.

E-mails purportedly sent by the RBI offering to transfer USD 12 million to the receiver's personal account were in circulation. In one of its latest awareness drives, the RBI had said, "It has come to the notice that an e-mail has been sent in its name from mail id: Reserve Bank of India no-reply@rbi.com and signed by RBI, Security Team offering a 'new online security protection' called net secured to reduce fraud and theft in various banking system.

The central bank cautioned the public that it had not developed any such software, nor had it sent any such mail asking online banking customers to update their account details to secure them. The RBI does not have any mail id with the extension @rbi.com. The central bank said such mails should not be opened and neither should attachments be downloaded as it could result in identity theft.

RBI releases framework for setting up of Wholly Owned Subsidiaries by Foreign Banks in India

The Reserve Bank of India (RBI), released the framework for setting up of Wholly Owned Subsidiaries (WOS) by foreign banks in India. The policy is released in pursuance of the announcement made in the Second Quarter Review of Monetary Policy 2013-14.

The policy is guided by the two cardinal principles of (i) reciprocity and (ii) single mode of presence. As a locally incorporated bank, the WOSs will be given near national treatment which will enable them to open branches anywhere in the country at par with Indian banks (except in certain sensitive areas where the Reserve Bank's prior approval would be required). They would also be able to participate fully in the development of the Indian financial sector. The policy incentivize the existing foreign bank branches which operate within the framework of India's commitment to the World Trade Organization (WTO) to convert into WOS due to the attractiveness of near national treatment. Such conversion is also desirable from the financial stability perspective. To provide safeguards against the possibility of the Indian banking system being dominated by foreign banks, the framework has certain measures to contain their

expansion if the share of foreign banks exceeds a critical size. Certain measures from corporate governance perspective have also been built in so as to ensure that the public interest is safeguarded.

Maharashtra to build steel silos to prevent wastage of grain, distress sales by farmers

The government of Maharashtra has decided to build steel silos for foodgrain in the major agricultural regions of the state to prevent wastage of grain and distress sales by farmers. "The silos would be built on the public-private partnership (PPP) mode at major market yards that are controlled by the Agriculture Produce Market Committee (APMC), Radhakrishna Vikhe-Patil, minister for agriculture, Maharashtra, said.

"At present, the state produces 140 lakh tonne of grain and has storage capacities for around 20 lakh tonne. Therefore, the farmers are not in a position to store grain and are forced to resort to distress sales instead of holding on for better prices," he explained. The silos would be constructed near major railheads for better transportation facilities. Grain such as rice, wheat, soyabeans, sorghum (jowar) and sugar would be stored in the silos. The minister said that surplus land belonging to the APMC would be used for this exercise. The state government has invested R100 crore through its subsidiary, Maharashtra State Warehousing Corporation (MSWC), to build silos, but as the corporation does not have land at its disposal; the state government is tapping into APMC's land.

The agriculture ministry will also launch a new scheme, Agriculture Produce Mortgage Scheme (APMS), which will enable farmers to mortgage their produce with nationalised banks and get loans. The warehousing receipts were earlier used by merchants and small farmers were not in a position to benefit or protect their produce, Patil pointed out. Under the scheme, the farmers get 70 % of the produce value as loan from the bank. After selling his stored produce, the farmer will have to repay the loan to the bank. The state agriculture ministry has opened 200 warehouses for farmers in the first phase. There are plans to open 500 warehouses in the second phase. At present, there are some 400 warehouses across the country, of which 36 are in Maharashtra. In the state, around 100 new warehouses are likely to get accredited by government-approved agencies by the end of March 2014. Nationally, the plan is to get 1,000 warehouses into the fold.

The current capacity of storage in the country is about 105 million tonne, with shortage to the tune of 35 million tonne. In 2012-13, MSCW helped Maharashtra farmers avail pledge loans to the tune of ₹44.81 crore against

warehouse receipts. The corporation is expected to give receipts worth ₹1,000 crore by March 2014. MSWC has also approached the state government for land to establish 400 warehouses in Maharashtra and a cold-storage chain for an estimated cost of ₹80 crore.

Changes in ARDBs

i) Shri Gopabandhu Satpathy, has assumed charge as Managing Director of the Odisha State Coop. Agri. & Rural Dev. Bank Ltd., w.e.f. 3rd September 2013.

ii) Shri Santi Kr. Debbarma, DRCS has assumed charge as General Manager of the Tripura Coop. Agriculture & Rural Dev. Bank Ltd., w.e.f. 17th October 2013.

iii) Shri Shiv Lal, Ex-MLA, has assumed charge as Chairman of the Himachal Pradesh State Coop. Agri. & Rural Dev. Bank Ltd., w.e.f. 30th November 2013.

iv) Shri R. Janarthanan, Dy. Registrar has assumed charge as Administrator/Managing Director of the Pondicherry Coop, Central Land Dev. Bank Ltd., w.e.f. 9th December 2013.

THE HARYANA STATE COOPERATIVE AGRICULTURE AND RURAL DEVELOPMENT BANK LTD.

Sahakarita Bhawan, Bay No. 31-34, Sector - 2, Panchkula

The Haryana State Cooperative Agriculture and Rural Development Bank Ltd., is the specialised institution in the State, which caters to the Long Term credit needs of the farmers for the upliftment of the economic position of the agriculturists and allied fields.

The bank advances Long Term loans to the farmers for the following purposes :-

Scale of finance and periodicity of Major Sectors

Farm Sector

Sr.No.	Name of the Scheme	Period	Scale of finance
1.	Minor Irrigation	9 years	₹1,00,000 to 3,50,000
	i. WCS/UGPL	-do-	90% of the project cost
2.	Farm Mechanisation	5-9 Years	85% of the cost of the Machinery
3.	Purchase of Agriculture Land	10 Years	Upto ₹10.00 Lacs
4.	Horticulture/Plantation	5-10 Years	₹ 40,000 to 1,55,000 per acre
	i. Medicinal & Aromatic Plants	-do-	90% of the project cost
5.	Animal Husbandry	5-7 Years	90% of the project cost
6.	Rural Godowns	Upto 9 Years	90 % of the project cost

Non Farm Sector

Sr.No.	Name of the Scheme	Period	Scale of finance
1.	Rural Housing	Upto 10 Years	Upto ₹ 5.00 Lacs
2.	Marriage Palaces	Upto 10 Years	90% of the Project Cost
3.	Community Halls	Upto 10 Years	90% of the Project Cost
4.	Village Cottage Industry	Upto 10 Years	90% of the Project Cost
5.	PublicTransport Vehicles	Upto 10 Years	85% of the Project Cost
6.	Rural Educational Infrastructure	Upto 10 Years	90% of the Project Cost
7.	Other SSI Units	Upto 10 Years	90% of the Project Cost

Rate of Interest

The Loans for the purpose of Non-farm Sector, Rural Housing and Purchase of land are being advanced @ 15.00% p.a. w.e.f. 3.8.2012. All other loans are being advanced @ 14.00% p.a. w.e.f. 3.8.2012 and a rebate of 5% is allowed on all slabs to regular pay masters.

Note:-

For further details, kindly contact The Haryana State Coop. Agri. & Rural Dev. Bank Ltd., Panchkula or the District Co-op. Agri. and Rural Dev. Banks at District level and its branches at Tehsil & Sub-tehsil level in the State.

Shakuntla Jakhu, IAS
Chairperson

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AGRICULTURAL NEWS

Cultivating vegetable pea rakes in good revenue

With a view to helping and encouraging farmers to take up vegetable cultivation, the Indian Institute of Vegetable Research, Varanasi introduced a project named 'Ensuring livelihood security through watershed based farming system module.'

Mr. Sushil Kumar Bind, a small farmer having nearly a hectare, is a beneficiary farmer of the project. He grows two varieties of peas Kashi Nandini and Kashi Uday, the seeds for which were supplied by the Institute. "I was advised to grow these two pea varieties by the scientists from the Institute as the pea crop fits well in rice-wheat growing areas, especially in eastern parts of Uttar Pradesh," he says.

Kashi Nandini comes to flowering in 32 days after sowing, bears 7-8 pods per plant. The pods are 8-9 cm long and well filled with 8-9 seeds with a shelling percentage 47-48 %. It is tolerant to leaf miner and pod borer with a yield potential of 9-10 tonnes per hectare. The second variety Kashi Uday is also an early maturing variety. Its characteristics are: plant height 58-62 cm, flowering in 35-37 days after sowing, plants have dark green foliage and short internodes with 8-10 pods per plant. The pod length is 9-10 cm and is filled with 8-9 bold seeds. It can yield 10-11 tonnes per hectare and a shelling percentage is 48 %.

After the first pickings the farmer left the crop for seed production as suggested by the scientists, since growing a crop for seeds can be a little more beneficial for the farmer in terms of income. He collected around 250 kg of pea in the form of seeds which he sold at good price. Senior scientist, Agricultural Extension from the institute says: "Till date the small farmer has been able to earn approximately ₹1,23,750 by sale of pea both as a vegetable and as seeds. He spent approximately ₹5,000 on seed, ₹10,000 on transportation, ₹1,000 on irrigation, ₹2,000 on land preparation, and ₹5,000 for fertilizer. "Totally he spent about ₹23,000 and earned about one lakh rupees in less than five months from this crop. Now he is planning to cultivate only vegetables in his land."

Some tips to enhance SRI rice yield

Compared to nearly a decade back today in paddy growing the systematic rice intensification method called SRI cultivation is universally accepted as a proven method to increase rice yield.

Unlike the conventional method, SRI is based on some basic principles like developing a nursery rich in soil nutrients and does not require flooding, early planting of single seedlings in the main field using

nylon ropes as markers and planting with a wider spacing between each seedlings. By doing so water requirement is considerably halved than what is required in conventional planting. Also seed requirement is low, about one tenth for an acre.

Before sowing in the nursery, farmers can treat the seeds with pseudomonas at 10gms/kg seed or 200gms azophos biofertilizer for 3kg of seeds or rice gruel at 2litres for every 2kg of seeds. It is advisable to cover the nursery beds using locally available mulching materials like paddy straw after sowing. After 3-5 days remove the straw during evening time and sprinkle water. Irrigation must be done for 14 to 15 days in the nursery. While transplanting in the main field square planting at a spacing of 25x25 cm is advised because it ensures optimum space for the crops to efficiently utilize resources. Besides it eases operation of cono weeder to remove the weeds.

The small metallic wheels of the weeder uproot weeds if any and mix it along with the soil thereby giving the main crop time to establish well in the soil before the weeds start growing again. Use of cono weeder is one of the important steps in SRI. It must be used at 10 days' intervals from the transplanting day from nursery to main field. Also irrigate to a depth of 2.5 cm (after hairline crack formation up to panicle initiation and after disappearance of residual water in the fields) as continuous flooding in the main fields during the early stages will diminish the size and health of root systems, making them less tolerant to water stress later. Hence, alternate wetting and drying is advocated.

Weaving livelihood through cultivating organic cotton

Tentulipada, a small village in Kalahandi district in interior Odisha, is predominantly a dry area. Known for poverty and a harsh dry climate, the tillers there could hardly lead a comfortable livelihood. Till some years back the entire village was cultivating cotton. The gamble on the crop was accompanied by a baggage of external, expensive, and often toxic inputs in the form of pesticides and fertilizers. But today this entire village is into organic cultivation.

The transformation towards organic started sometime during 2007 when initially 39 farmers took to the sustainable practice. It took two more years for all the farmers to shift to organic. In 2001 American bollworm infestation was very high and even 15 sprays of toxic chemical pesticides wouldn't help. “Today, this village does not worry about pests on cotton. They use their simple, naturally made bio-pesticides to control any pest problems,” says Mr. Ananthoo, co-convener of ASHAAlliance for Sustainable and Holistic Agriculture and coordinator of Safe Food Alliance, Tamil Nadu and an

organization called Restore in Chennai.

This was made possible by committed effort and intense dialogue with and amongst farmers by an organization called Chetna organic. Based in Hyderabad, the organization started a dialogue with the farmers and initiated the shift towards organic cultivation. Chetna Organic works with farmers in Andhra Pradesh, Maharashtra, and Odisha. In Odisha alone, the company functions in five districts, having five co-operatives, operating in 132 villages, impacting more than 5,000 farmers who in turn are organized into 411 SHGs (self help groups).

Farmers are federated into groups and involved in the whole process of the value chain. The local administration bought organic dhal from the farmers' federation to feed safe food to school children. The processing centres are specifically for the food crops (like dhal processing). Women play an active role in both manual and mechanical processing of the organic food produces.

Chetna Organic Agriculture Producer Company works on training, certifying and establishing sustainable market linkages for all their produce including cotton. Mr. Arun Ambatipudi, one of the founders of Chetna says: "Collectivization is the key for improvement of livelihood for small farmers. The other major point demonstrated here is that sustainable agriculture is the only way out for small and marginal farmers."

Tips to manage late blight in potato

Late blight is a fungal infestation. The first symptoms of the disease in the field are small light to dark green circular to irregular-shaped water-soaked lesions on the potato plant's leaves.

The circular or irregular leaf lesions are often surrounded by a pale yellowish-green border that merges with healthy tissues of the leaf. Lesions enlarge rapidly and turn dark brown to purplish-black. These lesions usually appear first on the lower leaves within 3-5 days of infection.

During periods of high humidity and leaf wetness, a cottony, white mould growth is usually visible on lower leaf surfaces at the edges of lesions. Spores formed on the mould spread to neighboring fields by air, irrigation thus beginning a continuous cycle of the disease.

Good soil protection measures provide better protection for the crop against this infestation. Harvest should not be started until all vines in the field are completely dry. Harvest should be done minimum two weeks after all the vines have dried up. In fields where late blight is confirmed, a minimum of two three weeks should pass. Late blight will not survive on dead

vegetation so tubers that are exposed after harvest are less likely to be infected.

Remove infected tubers before storage to reduce additional losses from soft rot. Tubers should be dry when placed in storage. The fungus can only survive in living infected potatoes, including potatoes in storage. There are several varieties that are resistant to late blight. These varieties will slow down, but not prevent, the disease.

The most widely used fungicide is Dithane M45 (mancozeb) at 3gm/lit. The systemic fungicide ridomil (metalaxyl) at 2gm/lit can also be used. Application of Ridomil (MZ 58), Ridomil once and Dithane M-45 (Mancozeb, 80% WP) subsequently is recommended for this infestation.

Quality planting material key to better productivity in orchards

Any fruit crop is perennial in nature and takes a minimum of three years after planting to bear the first fruits. "In spite of repeated cautioning, the farmers fail miserably in establishing their orchards due to faulty planting materials. Whenever due care is not taken to procure genuine planting materials, farmers will face a lot of problems in undertaking maintenance operations; thereby they lose their hope and incur heavy loss," says Dr. M. Selvarajan, Professor and Head, Department of fruit crops, Horticultural College and Research Institute, Periyakulam, Tamil Nadu.

It is a big challenge to scientists and extension functionaries to motivate farmers to bestow personal attention in sourcing genuine quality planting materials. Though farmers are keen in procuring genuine planting materials they are unaware of the techniques in identifying the correct nurseries to source the right planting materials from. There are certain guidelines to be followed for selecting planting materials.

Nurseries should have a well maintained mother block (scion bank), which should have proper labeling of the variety, the nursery should maintain the documents for the source of planting materials for the mother block, the grafts should have proper labels of the variety and the date of grafting should be displayed. Normally farmers procure the grafts without seeing the plants at the nurseries. One should realize that the fruit plants will start bearing only after four or five years and if the fruits are of poor quality, faulty planting materials are responsible and whatever money and energy have been spent are a waste.

After selecting the nurseries, the next question is how to identify and select the genuine and quality planting materials. An easy technique to identify the best quality planting material is that all the grafts of a particular variety should be uniform in their leaf

characters. If variation is observed among the grafts displayed with the label of a particular variety, then these can be adjudged as faulty, poor quality planting materials. Further, the saleable grafts in the nurseries should be properly hardened before delivery which can be judged from the label displaying the date of grafting.

The grafts, before sale, should have been hardened for a minimum period of three months. In reputed nurseries, hardening is normally done by gradually exposing the grafts to open sunlight. Another confusion which quite often bothers the farmers relates to what types of planting materials have to be used for different fruit crops. Except banana, acid lime and papaya most of the other fruit crops are cultivated by planting grafts.

Farmers usually prefer tall vigorous and two-year old approach grafts. But, considering the cost, difficulty in transport and poor field establishment, these grafts are not recommended for planting and at present it is recommended to plant soft-wood grafts. These two types of grafts exhibit good field establishment with less mortality and faster growth. Since, these two methods are very easy and rapid, the nurserymen also have started producing these grafts. In recent times, the farmers have also realized that these grafts are better than the approach grafts.

Management tips for controlling mango hoppers

Three species of mango hoppers namely Idioscopus niveosparsus, Idioscopus clypealis and Amirtodus atkinsoni are serious pests in the entire mango growing regions of India. They remain active throughout the year but the incidence is severe during the months from February to April.

Infested flowers shrivel, turn brown and ultimately fall off. Besides feeding injury, the hoppers also excrete honey dews on which black mould develops that interferes with photosynthesis and arrests new shoot development.

These damages result in weakening of the plants, reduction in fruit set and premature dropping of fruits, leading up to 60 % yield loss. Egg laying starts from February to March. Each female lays around 150 eggs, laid singly by inserting into florets and stalk of the inflorescence. The eggs hatch in 4 to 7 days. Freshly hatched nymphs are white and gradually turn yellowish-green. They undergo 4-5 moultings in 10-13 days and become adults which are light greenish-brown in colour with black and yellow markings. There may be 2-3 generations during the blossoming period. Adult hoppers are found all through the year hiding on the bark of the tree.

Management - Avoid close planting and prune dense orchards during winter for better light interception. Keep the orchard

clean by regular ploughing and removal of weeds. Collect and destroy affected inflorescence. Spray Carbaryl at 2gm/lit, Phosalone 1.5ml/lit, Etofenprox 0.03 %, acephate 75 SP at 1gm/lit, or imidacloprid 0.2ml/lit twice in February and March. The first spray should be given during flower formation stage and the second, two weeks after the first spray. Wettable sulphur at 2 gm/lit may be sprayed after spraying carbaryl to avoid mite resurgence.

Vertical method of sugarcane cultivation

From a humble beginning on a couple of acres five years ago, a technique for sugarcane cultivation is now in practice across 800 to 900 acres in Phagwara, The "vertical single-bud Phagwara technique" is an innovation developed by two farmers, Avtar Singh of Phagwara and Jujhar Singh of Bhonki village, and is being promoted by the Wahid Sandhar Sugar Mill of Phagwara.

Avtar Singh explains the difference. "This technique is different in many ways from the method of cane cultivation traditionally followed in the state. We promote a nature-friendly concept. Rather than horizontally as in the traditional method, we plant the seeds vertically, because cane grows in that direction. Also, we set the plants north to south so that they can get more sunlight and air," he says.

"We make 45 parallel rows with trenches between every two, rather than 95 rows as in the traditional method. We keep a four-foot gap between rows and one of two feet between plants; in the traditional method the plants are sown only a few inches apart," says Avtar Singh, who is cultivating on 90 acres and was awarded ₹51,000 by the Phagwara sugar mill for his innovation.

The technique saves about 85 % of the seeds required on a field of given size, still doubles the yield, and saves nearly 50 % water while helping recharge water and protecting the water table, say those who are promoting it. So far, 190 farmers of Phagwara have taken it up. This is a turnaround from the initial years, when most had spurned the option.

In the traditional method, one plant has 7 to 8 offshoots; in this one, we get 40 to 45 and finally 25 to 30 canes at the maturing stage. On every acre, the traditional method would have required 35 quintals of seed at ₹10,000, but the new method uses only 6 quintals at ₹2,000 because of the wider spacing. And we need to fill only 22 rows with water, against 45," Dr Singh, cane development officer, Phagwara. says.

Dr Singh says the same method is ideal for inter-cropping of potato,

cauliflower, pea, tomato, cucumber, lady's finger and other vegetables. Farmers can earn a minimum ₹1 lakh from one acre, he adds.

Farmers's notebook: Internet shows the way

One of the important reasons for the low level of agricultural knowledge dissemination from lab to land is lack of availability of appropriate extension technologies currently. Given the problems that extension workers and researchers face in facilitating direct contact with farmers due to physical distances involved and the lack of transportation needed for their mobility, application of Information and Communication Technologies (ICT) offers good solutions for the problem.

An attempt was made to evolve an effective model called 'e-Velanmai' ('Velanmai' is a Tamil word meaning agriculture) for dissemination of agricultural information from a multidisciplinary team of scientists from the Tamil Nadu Agricultural University (TNAU) directly to farmers on a pilot basis in selected areas of the State.

The model aimed to provide timely and appropriate technical advice to farmers on a need basis and was conceived and pilot tested by Dr. C. Karthikeyan, Principal Investigator and Associate Professor (Ag. Extension) and it is now being up scaled. "The project is aimed to facilitate farmers in improving their productivity and standard of living. The overall objective is to provide quality, timely, farm-specific scientific advice with the support of ICT tools and agricultural scientists at the farmer's doorstep," says Dr. Karthikeyan. The pilot project was tested in three areas Palar and Aliyar sub basins (dominated by resource rich plantation growers) of Coimbatore district, and Varahanadhi sub basin (dominated by resource poor vegetable growers) of Villupuram district.

The performance of the extension model in these two different scenarios was field tested and validated for its feasibility and based on the successful results obtained, the World Bank has supported upscaling the model to 26 different areas. It provides appropriate and timely agro advisory services by scientists to registered farmers using the Internet. Interested farmers pay a membership fee (₹50-150) based on their farm size to avail the service. The money collected is deposited in a bank account for ensuring self sustainability of the project.

Giving details as to how the system works, Dr. Karthikeyan explains: "A farmer makes a call on his mobile and registers his query. A field coordinator goes to the farmer's field and examines his crop status. Incase the farmer

needs advice on suitable crop variety, marketing, planting, spacing etc., advice is given on the spot by referring to the TNAU agri portal. If the problem relates to pest and diseases and their management, nutritional deficiency, weeds etc., advice is given based on a digital photo taken by the field coordinator and sent to concerned experts through Internet. The images are coded using the farmer's name and identity number. Experts diagnose the problem looking at the photos and offer solutions. These recommendations are downloaded and recorded in the membership card given to the members.

The average time taken for getting queries addressed is 1-3 hours. An overwhelming percentage of members feel that they are able to receive timely advice on the same day they raise the query to the field coordinator. Prior to the introduction of e-Velanmai project, many farmers stated that they had to depend on the shop keepers/dealers in their area for information.

Managing leaf rust in grapevines

Grapevine is one of the most important remunerative fruit crops of India which is widely grown in states of Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Haryana and Madhya Pradesh. There are several diseases affecting the crop among which leaf rust is nowadays posing a major threat to its large scale cultivation. Popular and widely grown grape varieties are becoming susceptible to the disease.

Leaf rust disease is caused by a fungal pathogen Phakopsora euvitis. Symptoms of the disease initially are brown spots on the upper side of leaves. Corresponding to the spots on the underside of leaves, yellowish-orange mass of powdery spores are formed profusely. Infection spreads rapidly on the leaves causing them to dry and wither. Thus the disease causes premature defoliation of grapevine during growing season which results in poor shoot growth and ultimately reduces the quality and quantity of fruits. Heavy infection during harvest time, which often occurs in warm temperature, causes considerable reduction in yield.

Grapevine leaf rust can infect the vines all year round but becomes noticeable during the dry season. The disease is spread through air. Spores are also spread through clothing or by illegal plant introductions. The best method of control is to prevent the onset of the disease by ensuring hygiene requirements before entering the vineyard. Propagation materials must be obtained from reliable sources.

Routine spraying should be done at fortnightly intervals with any of the systemic fungicides like tebuconazole, propiconazole or azoxystrobin at the recommended dosages. Varieties like Cabernet sauvignon, Cabernet franc and Beauty seedless are resistant to rust disease while the widely grown cultivars like Thompson seedless, Sonaka and Tas-A-Ganesh are moderately susceptible.

Agreement on agriculture and agri-trade reforms

Agriculture has been one of the most contentious issues debated at WTO conferences because it impacts the economy of every country, developed or developing. For India, it is even more critical simply because close to 60 % of the population is directly or indirectly dependent on farm and related activities for livelihood and sector accounts for about 15 % of the total GDP.

Under WTO, there is an Agreement on Agriculture (AOA) with the objective of reforming agri-trade and to make policies more market oriented with the justification that it would improve predictability and security for importing and exporting countries alike. The news rules and commitments apply to three pillars on which the AOA stands.

1) Domestic Support- subsidies and other programmes including those that raise or guarantee farm gate prices and farmers' incomes;
2) Market Access- various trade restrictions confronting imports; and
3) Export subsidies and other methods used to make exports artificially competitive

The agreement does allow government to support their rural economies, but preferably through policies that causes less distortion to trade. It also allows some flexibility in the way commitments are implemented. Developing countries do not have to cut their subsidies or lower their tariffs as much as developed countries, and they are given extra time to complete their obligation. Special provisions deal with the interests of countries that rely on imports for their food supplies, and the least developed economies. The main complaint about policies that support domestic prices or subsidise production in some way or the other is that they encourage overproduction.

This squeezes out imports or leads to export subsidies and unnatural flow of low-priced subsidized products on world markets. The AOA distinguishes between support programmes that stimulate production directly, and those that are considered to have no direct effect.

Domestic policies that do have a direct effect on production and trade to be cut back. WTO members have calculated how much support

of this kind they were providing, using calculation known as 'total aggregate measure of support' or Total AMS for the agriculture sector in a year in the base years 1986-88.

Developed and developing countries have agreed to reduce the domestic support over predetermined but differential time span and percentage. Least developed countries do not need to make any cuts.

Maharashtra villages fall back on centuries-old reservoir systems for irrigation

Paddy-growing eastern Vidarbha, called maji malgujari talaos, or simply mama talaos, these have been taken up for rejuvenation. The revival of 21 of them in Bhandara district under a special drive has led to a diversification in agriculture and fishing and diversion of output for thousands of farmers.

These mama talaos dotting the agricultural map of Bhandara, Gondia, Chandrapur and Gadchiroli districts were a picture of neglect until the Maharashtra government undertook the revival in 2008-09 years. 21 reservoirs were chosen for de-silting, strengthening, and building shelter pits for fisheries under the Government Machinery Deployment Programme. The 21 fully revived till now store an additional seven lakh cubic metres of water, the equivalent of a minor irrigation project. Farmers have now been able to harvest profitably not only the traditional paddy but also the newly introduced sugarcane. The other outcome has been an increase in rabi coverage from 8 ha to 91 ha, and summer crop coverage from nothing to 79 ha.

Shrimp, fish and paddy cultivation in same field is lucrative

Pokkali farming is a system in which paddy and shrimp are grown alternately in the same field. To give a fillip to this system of farming, the Central Marine Fisheries Research Institute (CMFRI) suggested a new method of integrating fish growing in iron cages along with regular paddy and shrimp cultivation.

A young farmer from Ezhikkara, Mr. Saibil, readily agreed for this new experiment in his field, which was funded by the National Initiative on Climate Resilient Agriculture (NICRA). He was trained on pond construction, nursery rearing, fish transportation, feeding, cage maintenance, etc. Nursery reared mullet and pearlspot fishes were stocked in iron cages. They were fed using floating formulated pellet feeds during morning and evening. Cages were cleaned fortnightly and nets changed once in two months.

In eight months time the fishes were harvested and the farmer was able to get a good profit of ₹80,000 from the fishes alone. In addition he also earned an income of ₹50,000

from the paddy and shrimp. The harvest was also celebrated as a festival by the local pokkali farmers. Growing paddy alone is not very remunerative for farmers. Paddy along with shrimp cultivation can get ₹50,000 but in this new technique the profit margin is quite high for a farmer since fish is also grown.

"If implemented in a hectare a farmer can get anything from ₹80,000 to ₹85,000 from this cage culture of growing fishes in addition to paddy and shrimp that can fetch ₹50,000," says Dr. Shinoj Subramannian, Programme Coordinator and Senior Scientist, KVK (Ernakulam) of CMFRI.

Paddy is grown during June to October (120 days maturity period) followed by shrimp farming during November to April. Residue from the paddy crop forms the feed for the shrimps and the residue of the shrimp culture forms the fertiliser for the paddy. "It is a purely organic system and the paddy and prawn possess good taste since there are no chemical inputs used," says Dr. Subramannian. Size of a typical pokkali field ranges from 2 to 30 acres and each field is confined within bunds. There is a sluice gate for water movement to and from the field. The area inside the field adjacent to the sluice gate is called sluice pit (Thoombukuzhi in Malayalam).

Since Pokkali farming is climate dependent, constant attention is required at each phase of its practice. Even then good production cannot be guaranteed and yields unpredictable. Large amount of manual labour is required since no specialised equipment or machinery is available for this," says Dr. Subramannian. Quality and taste of pokkali paddy and shrimp are the main attractions. There is no premium market for the paddy or shrimp. They are sold in the local market.

During the year 2009, Pokkali farming system received Geographical Indication (GI) certificate and an approved logo for its products. The pokkali farming community also received the Plant Genome Community Saviour Award during 2010-2011.

Controlling black rot in pineapple

Black rot of pineapple is a post-harvest disease. It is also known as water blister, soft rot or water rot. Penetration of a fungus inside cells occurs through wounds and stem cutting, causing infection. Fruit may be bruised or wounded during picking, packing, storage and transportation. The wounds pave the way for fungal infection. Conditions of high humidity tend to encourage development of black rot.

At the early stage of infection, the fruit exhibits a juicy and water soaked appearance. At advanced

stage, it is covered with blacks spores and the flesh becomes totally black. As the decay intensifies, the affected area emits a bad odour. The rot eventually destroys the entire fruit. Infestation starts at the stalk-end of the fruit, resulting in small, circular, water-soaked spots that are very soft.

Care should be exercised during harvesting and packing so that the fruit is subjected to minimal injuries. Fruit may also be dipped in a fungicide after harvesting, to give protection against infections. Avoid contaminating the central base of the plant with disease-infected soil especially during the hilling-up operation. If polyethylene mulch is more practical and economical, use it on raised beds. Good soil drainage is a necessary. Where rainfall is heavy or soils are not well drained, soil management techniques such as ridging must be used to improve drainage.

Planting material that is cured before planting has less rot problems. Crowns and slips can be exposed to the sun for several days before planting. Maintaining weed-free areas around fields reduces inoculums and therefore disease problems. Field plantings of pineapple are usually in double-row beds. Plantings of small fresh fruit are advisable.

Madhya Pradesh farmers turn seed producers to enhance income

Under the National Agriculture Innovation Project (NAIP) of Indian Council of Agricultural Research (ICAR) a project on seed production among small farmers in the region was introduced to make good quality seeds available for farming operations.

To start with, many of the farmers were not very open to the idea but following discussions with them to create awareness that seed production can ensure a better income they were prepared to try it out. They got together and formed about four societies named Laxami Beej Utpadak Sahakari Sanstha Maryadit, Golabadi, Sharda Beej Utpadak Sahakari Sanstha Maryadit, Narsingrunda (Rotla) with each society comprising 22 and 21 growers as members.

Trainings on formation and management of societies, quality seed production, maintaining good standards were regularly arranged for them through the Krishi Vigya Kendra of the ICAR. “Today the society members are able to produce good seeds, process and store them for marketing to the Government seed departments in the State. The beneficial effects of these societies on farmers' lifestyles are clearly visible as they are getting better prices for their produce. Good quality seeds are available to others at the right time and place. With increase in profit margins the farmers in the area have become

entrepreneurs in seed production and marketing," says Dr. I.S.Tomar, Programme Coordinator, Krishi Vigyan Kendra, Jhabua, Madhya Pradesh.

All the four societies have till date produced around 307.2 tonnes of quality seeds in the last two years in an area of 6,223 hectares from six crops. The major crops being grown for seeds are soybean, maize, pigeonpea, black gram, wheat and gram. Apart from the revenue generation another impact the societies have been able to create is improved seed varieties from the above mentioned crops in an area that gets low rainfall. Today the farmers, apart from supplying the seeds to government seed agencies are also supplying to many other parts of the region.

New garlic variety for North Indian areas

The National Horticultural Research and Development Foundation (NHRDF) in Nasik, Maharashtra has developed a new garlic variety named Yamuna Safed-5 suitable for growing in Delhi, Uttar Pradesh, Haryana, Bihar, Punjab, Rajasthan, Gujarat, Maharashtra, Karnataka and Andhra Pradesh. The bulbs are white and big in size about 4.5-5.0 cm in diameter. The crop matures in 150-160 days after planting and shelf life is good. Average yield is about 17-18 tonnes from a hectare.

Four methods can be used for planting i.e. dibbling, furrow, broad casting and seed drill. The crop can be planted from August to November in Madhya Pradesh, Maharashtra, Karnataka and Andhra Pradesh and from September to November in other parts of North India. In Gujarat planting is done during October to November. In hilly regions the correct season for planting is during March-April. In West Bengal and Orissa, October-November is the right time for planting.

About 500-700 kg of cloves are required for a hectare and planted at 10 x 7.5 cm spacing. Care should be taken to select big cloves. It has been recommended to apply 50 tonnes of farm yard manure for a hectare during field preparation and to mix well with the soil. About 100:50:50 NAP is recommended as fertilizer. Complete dose of phosphorus, potash and half of nitrogen may be applied before planting. Another half dose of nitrogen may be applied after a month of planting.

The crop needs to be irrigated at an interval of 8-10 days during active growth and 10-15 days before harvest. It is considered ready for harvesting when the top turns yellow or brown in colour and shows signs of drying up. Bulbs are taken out along with the tops and windrowed for curing about 15-20 days under field condition. After curing, the necks are cut by leaving

2.5-3.0 cm from bulbs and sent to the market after proper sorting and grading for sale. It can be stored in bundles along with foliage in well ventilated godowns.

Neeli Raavi population dwindling in Punjab

Dark as any other buffalo but distinct because of its blue eyes, a white tuft on its tail and five white patches, one each on its forehead and feet, the Neeli Raavi used to thrive in undivided Punjab. Today, the bulk of its remaining population is in Pakistan while a few lakh survive on the Indian side, all in pockets of the border districts of Ferozepur, Taran Tarn, Gurdaspur, and only a few thousand of them are purebreds.

For the past two years, the Guru Angad Dev Veterinary Animal Sciences University has been working on a national project to save the rare, high-mulching breed. The Centre's Open Nucleus Breeding System to Improve Sahiwal Cattle and Neeli Raavi Buffaloes in the State of Punjab, with a budget of ₹2 crore, aims to rear at least 100 purebred Neeli Raavi buffaloes on a farm at Tarn Taran, from where semen can be supplied to Punjab farmers and exported to other states. The university is hoping for permission either for direct imports or for an exchange programme with Murrah buffaloes, which are found abundantly in Punjab.

Experts say the declining numbers, unless checked, will lead to the extinction of the Neeli Ravi, whose natural habitat has been in Punjab for more than 5,000 years. "Punjab can play a key role if we are allowed to get purebreds from Pakistan," says Dr V K Taneja, vice chancellor of the university.

The Livestock Census of 2007 found that the population of breed had dropped to 3.47 lakh from 4.12 lakh in 2003. And only a few thousand now will have all defining characteristics of the breed, say experts; the rest will have been interbred with the Murrah. The Murrah comprises 93 % of Punjab's buffalo population, the Raavi the rest. Under its ongoing conservation plans, the Ministry of Animal Husbandry and Dairying is looking at Punjab to focus on the Neeli Raavi, with no such buffaloes in Haryana or other agricultural states.

The farm is way short of the targeted 100 purebreds. It has managed only 55 adult buffaloes, besides 29 female and 8 male calves, and not all of them are "true specimens". Their average annual milk yield was 2,350 kg, with a peak of 14.2 kg in a day. Six buffaloes crossed 3,000 kg with a peak of 18.5 kg; one of these crossed 4,200 kg.

Herbal Hit to tick-borne disease

To counter the toxic effect of chemicals being used as acaricides a drug/preparation to kill ticks on dairy and meat animals, the Indian Veterinary Research Institute (IVRI) in Izatnagar, Bareilly, and the Lucknow-based National Botanical Research Institute (CSIR-NBRI) have jointly developed a novel herbal formulation.

Eco-friendly and non-toxic, the preparation claims it has no side-effects unlike many of its chemical counterparts, some of which have been linked to cancer in humans as well as reduced productivity in animals. Once commercialised, the herbal formulation hopes to play a significant role in bringing down the losses to Indian cattle farmers from tick-borne diseases, estimated at around ₹3,000 crore annually.

The Indian dairy and meat industry faces two kinds of problems due to the presence of ticks and the use of chemicals to kill them. "Tick infestation leads to direct and indirect harm to animals in the form of blood loss, general stress and irritation, decrease in productivity, weakened immune system, damage to hides etc.," said Dr. A. K. S. Rawat, principal investigator of the project at NBRI.

"Even our dairy and meat market is limited to a select number of countries because of its quality," said Dr Srikanta Ghosh of IVRI, chief principal investigator of the project. According to NBRI, almost all types of dairy and meat animals in the country suffer from tick infestation and they are mainly controlled through the use of synthetic chemicals. But chemical usage has itself become a major problem. "Due to the indiscriminate use of drugs, ticks have developed resistance to almost all available acaricides/insecticides," Dr. Rawat said. "Moreover, overuse of acaricides and insecticides have led to contamination of dairy products, which enters the human body and leads to a host of diseases, including cancer," he said, citing the 'cancer train' in Punjab which has reported the extensive use of chemical acaricides and insecticides.

"What happens is that the ticks become resistant to chemical acaricides over time and hence the acaricide, which, for example, was initially used as 1.5 % concentration, is eventually used in 10-12 % concentration," Dr. Rawat said. "This leads to an increased chemical residue which essentially means an increased incidence of life threatening diseases." The problem caused the IVRI to take up the multi-crore project to find herbal acaricides in 2008-09 under the National Agricultural Innovation Project of the Indian Council of Agricultural Research, with NBRI and Kerala Veterinary and Agricultural Sciences University as consortium partners.

Integrated management of sugarcane shoot borer

Sugarcane shoot borer is a pest of major importance in all the cane growing areas of India. The caterpillar damages 50 % of the shoots by tunnelling downwards into them. The pest occurs during pre monsoon and monsoon seasons. The larvae can migrate and attack many shoots. Wilted shoots can be easily pulled out. Rotten portion of the shoot emits foul odour. Heavy infestations are favoured by poor irrigation, scanty rain fall, high temperature and low humidity.

Maximum damage is caused when the crop is one to three months old. Adult moth is pale brown coloured. Female lays about 400 scale-like flat eggs in different clusters on the undersides of leaves. Eggs hatch in five days. The larva cuts a hole in the stem above ground level and bores into the central shoot and feeds from inside. It appears pale yellowish in colour with five violet stripes of mottling brown marks.

Larval period lasts for 15 days. It pupates in the stem itself for 10 days. Total life cycle takes place in six weeks. Five generations are completed in a year. Maize and pearl millets are alternate host plants other than sugarcane.

Adopt early planting during main season. Use tolerant sugarcane varieties such as CO 421, CO 661, CO 917 and CO 853. Ensure adequate moisture to bring down the soil temperature and to increase humidity. Remove and destroy dead shoots. Provide trash mulching up to 1015 cm thickness three days after planting. Earth up the crop to a height of 15-22 cm by two months after planting.

Raise intercrops like green gram, black gram and daincha with sugarcane. Sequentially release tachinid fly parasitoid, Sturmiopsis inferens at 125 gravid females /ha from 30 to 50 days after planting. Soil application of carbofuran at 33 kg/ ha or phorate 10G at 25kg/ha during planting is beneficial. Two rounds of spraying of chlropyrifos 20EC at 1000ml or monocrotophos 36WSC or lindane 20EC at 500ml /ha or Neem Seed Kernel Extract 5% during 60-90 days after planting should be done.

Two types of housing systems for dairy animals

Proper shelter plays a key role in improved milk production in dairy animals by protecting them from extreme weather conditions besides providing comfort. “Generally, in Haryana, farmers do not provide shelter to their dairy animals except very few who have adopted improved production technology for dairy farming or are maintaining both high milk yielding buffaloes and crossbred cows,” says Dr Rajinder Singh, Senior Extension Specialist (Animal Sciences), Lala Lajpat Rai University of Veterinary and Animal Sciences Extension

Center, Rohtak, Haryana.

Normally cattle farmers do not provide sufficient space for the animals inside a shed. This often results in competition among the animals for feed and social interaction which may sometimes result in some of them turning a little violent. In Haryana two types of 'housing systems' are generally used in dairy livestock management. Closed and loose housing system.

A closed system is comparatively costlier and only big farmers having a large number of cattle can afford it. Loose housing system on the other hand, is based on choice, and more suitable for small farmers who have high yielding animals. It costs less since local material is used for building, is airy and can be altered according to the changes in the climatic conditions.

Main dairy operations comprise feeding, milking, cleaning and looking after animal health. Major operations like milking, cleaning are all performed only at the rear side of animals. “We always stress on the need for enough space behind and in between the animals tied inside the shed because it makes movement easy for the person to clean and milk the animals. It also enables the farmer to spot problems related to udder health (mastitis) and other sicknesses of dairy animals quickly. We refer to this as 'tail to tail' system. It has proved beneficial to dairy farmers because the time spent in dairy operations in tail system is 15 % less than the time spent in head to head system,” explains Dr. Singh.

Before constructing a shed it is advisable for farmers to check whether they have continuous electricity supply since uninterrupted power is a must for clean and disease free animals housed inside sheds. They must also take care to see that the floor of the shed is hard, non slippery, easy to clean and sloping on one side for the water to run off into a drainage system. Maintaining cleanliness and hygiene inside the shed is an essential part of successful dairy management. Farmers are advised to keep the shed free of flies and other insects especially during summer and monsoon by either spraying or dusting suitable insecticides and pest repellants based on advice of their local veterinarians, according to Dr. Singh. Following right milking technique is important because it is the quality and the production of milk which can prove a boon or bane in dairy farming.

The following practice can be followed: Stick to regular milking hours as far as possible and equal milking intervals. After washing the udder with some antiseptic and wiping it with a clean cloth, practise dry and full hand milking method followed by stripping. Complete the milking quickly (within 5-7 minutes), gently (without any physical stress) and quietly (without much noise).

Management of white stem borer in coffee

Coffee white stem borer, *Xylotrechus quadripes*, is a serious pest of arabica coffee causing a yield loss up to 40 % in all coffee growing areas of India. It is a blackish brown coloured beetle measuring about 2 cm in size with three pairs of white stripes running obliquely across the wings. Alternate host plants of this beetle include rose sandal wood, teak etc.

The larvae enters the hard wood and burrows up to the roots. Infested plants show yellowing and wilting of leaves, presence of ridges on the stem, wilting of branches and occasional drying. In severe infestation a plant may have 20-25 grubs. Young plants succumb completely to the attack and older plants get damaged. Female beetle lays eggs in cracks and crevices of the bark of the main stem or the primary branches.

Hatching takes place in 10-12 days and the grub first feeds on the bark and then bores into the woody tissue by making zigzagging tunnels, and tightly fills them with excreta. The grub stage lasts up to 10 months.

Build good shade as the adults prefer coffee plant exposed to sunlight for egg laying. Every year look for ridges on the main stem and thick primaries to survey the level of infestation. Trace the infested plants and flight period of the beetles to contain further spread of the infestation.

Prune infested plants or uproot them, if the borer has burrowed up to the root then burn the infested plants. Storing of infested stem in the estate will result in a continuous infestation. Remove the loose scaly bark of the main stem and thick primary branches by using coir gloves or coconut husk. Spray once in April-May and another spray at the end of October with chlorpyrifos 20EC at 600ml in 200 litre of water along with 200ml of wetting agent. Alternatively stems may be swabbed with carbaryl 50WP at 4kg diluted in 200 litres of water.

Agro bio pharmacy concept well received by Kerala farmers

Krishi Vigyan Kendras (KVKs) or farm science centres exist in almost all districts of the country to support farming activities. But only a handful of them are able to conceive new innovative ideas and transform them into action at the field level.

The Kerala Kannur kendra is one such institution that has been successful in introducing an agro bio pharmacy and farmers' engineering service and training (FEST) centre. The major problem faced while adopting organic farming is the non-availability of trustworthy organic products and the cumbersomeness of preparation of organic products.

An array of products ranging

from tobacco decoction to pheromone traps are produced and sold at the pharmacy. The labour for the production of these items is provided by different self-help groups trained by the Kendra. "It is a concept conceived by us and is aimed at providing inputs required for organic agriculture. Safe use of insecticides is just one of the numerous tools of Integrated Pest Management recommended by agricultural scientists to safeguard soil and human health," says Dr. K. Abdul Kareem, Programme Coordinator, Krishi Vigyan Kendra, Kannur, Kerala Agricultural University.

Another important product available at the pharmacy and is quite rare in other organic bio input manufacturing units is neem oil soap named as Neem-X, which is a ready-to-use neem based pesticide. The biopharmacy concept promoted throughout the State as the organic farming policy of the government envisages the phasing out of chemical pesticides and fertilizers from the farming sector to convert Kerala into an entirely organic state in five to 10 years.

Self-propelled wetland direct rice seeder

A self-propelled riding type wetland direct rice seeder has been developed for sowing pre-germinated paddy seeds in puddled fields by Agricultural Engineering College & Research Institute, Kumulur, Tamil Nadu Agricultural University. The seeder can be operated by a 4.4 hp horizontal type air cooled four stroke single cylinder diesel engine. The gear boxes used in this machine are taken from the transplanter of riding type machine. Rubber moulded iron lugged wheels are used as ground wheel.

The ground wheels are fitted at both end of the axle. The ground wheel drive is transmitted to the countershaft fitted at the rear side of the lower frame through chain sprocket arrangement. An opening is made in the upper part of the seed drum for storing the pre-germinated seeds at the time of operation. Funnel and seed disc with cup feed is placed inside the seed drum for effective dropping of seeds from the seed drum to the field. The eight seed drums are bolted to the "L" angle in order to prevent rotation of the drums during operation. The spacing between seed drums is adjustable from 250 to 300 mm.

The funnel receives the seeds from the cup and the seeds are dropped on the puddle soil by gravitational force. Float is made of PVC and placed in between the two wheels of the machine for leveling the puddle field. The rear end of the float is attached to "L" angle of the seed drum with the help of a chain for automatic depth adjustment according to the field. The seeder is an eight row machine and is capable of sowing pre-germinated seeds at 1.92 ha/day.

It is proced at ₹90,000. The cost of seeding by this machine is ₹635 per hectare. The machine is capable of sowing pre-germinated rice at 9 kg/hectare. Cost of manual transplanting comes to ₹7,000/hectare whereas for machine transplanting it comes to ₹10,000/ha inclusive of seeds.

Instrument which tells the farmer just how much irrigation his paddy field needs

The tensiometer has been launched under a three-year project by Punjab Agriculture University in collaboration with University of Columbia and is being funded by International Development Research Centre, Canada.

It can save around 20 to 25 % irrigation water without any effect on crop yield. Installed at a depth of 15-20 cm in the field, it comes with yellow and green strips that serve as indicators. The farmer needs just to watch the water level inside its inner tube. Irrigation of paddy is necessary only when the level reaches yellow. After 15 days of flood irrigation, paddy just needs moisture, but farmers' psyche is such that they feel the crop will not survive without continuous flooding, says Dr R S Sidhu, dean of basic science and humanities at PAU, and principal project director of the programme.

Dr M S Gill, PAU's director for extension education, says Punjab's farmers tend to irrigate paddy 26-27 times when it can be kept at four or five times. "Even if a farmer can save four-five watering sessions in a season in a single field, it would ultimately result in a huge saving in a state like Punjab, where over 26 lakh hectares is dedicated under paddy," says Dr Kamla Vatta, associate professor. "The instrument is very cheap at around ₹300 to 350 and can be used on a large area. It can serve as an indicator for fields where it is not installed, if the timing of irrigation of that paddy field is the same as that for the field where the tensiometer is installed," says farmer Gurpreet Singh of village Bhaini Arora in Ludhiana, who has been using it on his 10-acre farm for the past couple of years.

AP farmers can buy subsidised seeds online

Farmers in Andhra Pradesh need not stand in serpentine queues and wait for hours, and sometimes days, to get their packet of seeds. They now can book their slot using Mee Seva, the Government-to-citizen service offered through 7,000 centres. “Mee Seva system will be utilised for distribution of subsidy seeds under various programmes. The seed supplying agencies will ensure the availability of seeds as per the bookings made these centres. Issues related to crop subsidy too could be handled using this service,” Andhra Pradesh Minister for IT, said.

Poultry farmer turns litter into light

In the poultry hub of Namakkal in Tamil Nadu, almost every farmer owns at least 2,000 birds, grown for egg and meat, but none would take a second look at their droppings though, as an entrepreneur among them says, the litter "holds the key" to electricity generation. "If the total poultry litter in the district is collected daily [6,000 tonnes] and processed, nearly 16 MW of power an hour can be generated, with 1,000 tonnes of manure and 10,000 litres of liquid biofertilizer as by-products," says Salai Sivaprakasam, executive director of Subhashree Bioenergies (P) Ltd.

The plant, built on 60 acres at Goundampalayam, Tiruchengode, is touted as the country's first power project that extracts energy from poultry excrement. It started with a capacity of 2.5 MW, later scaled up to 3.76 MW. The bird muck is collected daily from several places and brought to the factory, where it is fed into a processing unit. It emits methane gas that is converted into electricity with a patented technology. The slurry, generated as residue, is sold as manure and liquid bio-applications to farmers.

The plant has been recognised by the Union Ministry of New and Renewable Energy as a demonstration project for sustainable clean energy. The entire plant, save the engines, is indigenous and is one among the 11 projects worldwide approved by the United Nations Development Programme. It has also been declared a Clean Development Project under the Kyoto Protocol to the United Nations Framework Convention on Climate Change, says Mr. Sivaprakasam.

Orchard cultivation with beans as intercrop

A predominantly dry area, ragi and maize are the main crops grown, intercropped with mustard. Since farm activities are only for six to seven months the farming population moves out to nearby towns in search of work for the rest of the year leaving the fields fallow.

"This annual migration was a result of no work or income during the lean season. If some sort of agriculture work could be provided during this time, then the tribals would not move to towns in search of work," says Dr.P.Alagesan, Programme Coordinator, MYRADA (The Mysore Resettlement and Development Agency) in the region who came up with an idea of setting up orchards since this would need constant attention during the first two years and also can provide a perennial income.

Accordingly, amla, mango and citrus were selected to be grown in orchards and trees like silver oak, tamarind and some cassia species were to be planted as fence crops on the borders of the fields, Since the area is bone dry during summer

three conditions were essential to keep the orchard development programme alive one, the farmer must be made to stay back in his field and work. For this he should be remunerated well so that he doesn't feel the need to leave his field barren and till the orchards come to bearing an alternate source of income for the waiting period must be introduced.

After a thorough study of the economics and the climatic conditions of the region, vegetable beans was selected to be grown as an intercrop in the orchards because the crop thrives well in hilly regions and being a short duration variety, it can be harvested within 90 days, filling the income gap till the trees start bearing.

"Usually, in this region, beans sowing starts in late April and all the farmers complete their last picking by mid July. When optimum conditions prevail, an average of 1.5 to 2 tonnes of beans can be harvested in an acre. "Based on personal interaction with 25 farmers in the village it was found that the total yield after four pickings was 49,985 kg. On an average, farmers were able to harvest around 1,800 2,100 kg of beans from a one acre plot."

Five communities-managed resource centres (CMRC) have been set up and they provide information on seed availability and technical information on time. In order to get the initial impetus, Myrada helped to set up a revolving fund to assist farmers in dealing with the initial fund crunch.

Technique for Kharif onion bulb production

For successfull Kharif onion nursery production, during heavy rains the National Horticultural Research and Development Foundation, Nashik has developed a technology for Kharif onion production through bulblets. Bulblets raised from varieties like Agrifound Dark Red, Baswant-780, N-53 and Arka Kalyan during summer season are used for planting. The width of nursery bed should be 0.60 metre and length can be at 3-4 metres as per convenience.

Surface of beds should be smooth and well levelled. The bulblets should be treated with thiram at 2 gm/kg of seed for control of damping off disease. The nursery should also be treated with thiram or captan at 4-5 g/sq. mt. area. Nursery bed should be irrigated at 15-20 days before sowing and covered with 250 gauge transparent polythene for soil solarization.

Bulblets are sown on raised beds or in flat beds depending upon the soil by following the broadcasting method. Best time of planting the bulblets is first fortnight of January to early February depending upon the weather condition of the area. Planting on raised beds or on both sides of ridges in BBF (Broad Band

Furrow) system is recommended for better bulb development and yield. Best time of planting July-August in Maharashtra and August in northern parts of country. Planting of oversize bulblets reduces the quality of produce. Dipping the bulblets in fungicide carbendazin at 0.1 % and insecticide monocrotophos at 0.1 % solution before planting helps in better establishment of bulblets.

Planting should be done at 10 cm from line to line and 10 cm from plant to plant that is, 10 x 10 cm spacing is recommended. About 100 kg N, 50 kg P and 50 kg K is required for one hectare. Use of stomp at 3.5 lit/ha or goal at 0.15 kg /ha applied 3 days after sprouting of bulbs in field plus one hand weeding at 35-40 days give better results. Spraying cytozyme at 0.2 % at 15 and 45 days after planting was found effective.

A robust indigenous poultry breed saved from extinction

Kalamasi or Kadaknath fowl breed that is native of Bhil and Bhila tribal regions in Madhya Pradesh. The birds are jet black in colour and reared mainly for their meat, which is also black in colour but softer than that of other desi birds.

"A survey programme conducted by the Jhabhua Krishi Vigyan Kendra some years back threw light on the alarming fact that the breed is slowly becoming extinct and only a few hundreds are left. Through the National Agriculture Innovation Project (NAIP) of the Indian Council of Agricultural Research (ICAR) under Rajamata Vijayaraje Scindia Agricultural University,

The birds are robust by nature and can tolerate extremes of climate. They can be reared quite easily and there is no need for any special attention or round the clock care for them. They thrive well in a minimal management system and are good scavengers. As a result, feed cost gets considerably reduced. They can be housed in large bamboo baskets or inside store rooms.

Both the cockerels and hens grow quite fast and the hens start laying eggs from sixth month of age onwards. In a year a single hen lays 80-120 eggs. Kadaknath birds are poor brooders. They do not hatch their eggs. Therefore the tribals use other desi hens to hatch the eggs. The desi hen is placed on the eggs kept in a bamboo basket lined with dry straw or grass to provide a cushioning effect. This traditional practice is being encouraged to propagate this breed through natural means and ensure availability of chicks in the villages.

The NAIP initially started a pilot project with only 10 poultry houses each with 100 birds and named it as Kadaknath Murgi Palan Samooh Jhayda. Presently around 500 poultry units are functioning at Jhabhua with active support from Gramin vikas trust and integrated watershed management

programme in Jhansi. A hatching unit has been established at a cost of ₹40 lakhs to increase the availability of this breed to other interested growers. All the growers have been trained on scientific management of this breed, balanced feed, health management and marketing. Timely vaccinations have been administered by specialists and deworming at periodical intervals is also being done.

By adopting such measures they have succeeded in bringing down the mortality of the bird from 50 % to 10-12 %. The birds attain a body weight of 1.5 kg in 105- 120 days. This sustainable system of livelihood through Kadaknath rearing has been well recognised by the district administration of Jhabua and the Kadaknath Murgi Palan Samooh Jhayda and awarded a certificate of appreciation by the district administration.

Bio control agent to control tree infestations

Different microorganisms including fungal pathogens that live in the soil can cause diseases in plants. It is necessary to control harmful soil pathogens to avoid economic loss from affected crops. However, using chemical fungicides to control these prove costly and will create environmental problems.

To control the fungal pathogens bio control methods are always advisable and are economically feasible. One such is Trichoderma viride (Tv), a soil fungus and found useful as bio control agent for plant diseases. This fungus controls diseases in plants particularly in trees caused by the other soil fungal pathogens. Though Tv is also available in the market as a commercial product it can be produced by the farmers using agricultural wastes to reduce cost and is a good alternative for chemical based fungicides.

The following methods can be adopted to produce Tv for application:

Innoculate about one gm or five ml of Tv in the plastic trays (30 x 40 cm) filled with either dried rice straw, or saw dust or sugarcane bagasse. After inoculation necessary watering must be done to maintain wet condition. The substrates must be tightly closed with a thin muslin or cotton cloth and maintained at room temperature for better growth.

The culture appears as green moulds on the substrates after 10 days of inoculation. These green moulds can be further allowed to grow for another 2-3 weeks. After a month the Tv is noticed as a green powder in the substrates. This can be directly used for controlling the tree saplings in the nursery. It has been found effective in the control of root rot, damping off and leaf blight/wilt diseases that are common infestations.